

**THE DIFFUSION OF CORPORATE SUSTAINABILITY IN GLOBAL SUPPLY
NETWORKS: THEORETICAL AND EMPIRICAL PERSPECTIVES**

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ABSTRACT

THE DIFFUSION OF CORPORATE SUSTAINABILITY IN GLOBAL SUPPLY NETWORKS: THEORETICAL AND EMPIRICAL PERSPECTIVES

The rapid increase in the adoption of global sourcing practices that took place in 1980's led to significant transformations in traditional value chains, which were encompassed by single, vertically integrated organizations, and became globally dispersed networks of independent buyers and suppliers, where each of these firms performs specific value-adding activities that will ultimately result in that value chain's final output. As concerns over the negative social and environmental impacts caused by industrial activity continue their rise to prominence, stakeholders are starting to realize that the changes through which value chain structures underwent have shifted the locus of corporate sustainability from individual focal firms to entire supply networks. This wider scope of stakeholder expectations has, thus, created a necessity for corporate sustainability initiatives to be diffused to all members of the supply network.

Chapter one constitutes a theoretical investigation of the strategic relevance of corporate sustainability diffusion in global supply networks for both focal and non-focal firms within global supply networks, as well as the determining factors of a firm's capacity to diffuse and performance in diffusing corporate sustainability within its supply network? The theoretical contributions of this study are divided into two parts. The first part seeks to establish a more solid cause and effect relationship to explain why firms that are more highly exposed to stakeholder scrutiny (i.e. focal firms) should necessarily face a higher risk of being held responsible for the sustainability-related misconducts of lesser exposed members of the network (i.e. supplier sustainability risk). The first part also proposes an

expansion of the dichotomous categorization of corporate sustainability initiatives as either mandatory or voluntary, to add what we termed: semi-voluntary corporate sustainability initiatives. This addition serves to explain why certain firms adopt non-mandatory corporate sustainability initiatives, which apparently destroy shareholder value. We argue that this distinction is important because cases concerning semi-voluntary initiatives are likely to involve higher levels of supplier sustainability risk. In part two of the theoretical development we introduce a theoretical framework to explain the existing heterogeneity among different firms within a supply network in regards to their ability to implement the diffusion of corporate sustainability initiatives in the network (i.e. network dominance) and propose that it results from the interaction among three network-related firm characteristics: relative resource value, resource substitutability, and relative network position. Lastly, we discuss why higher levels of network dominance increase the likelihood that firms will be able to ensure a high level of corporate sustainability diffusion in the network.

Chapter two aims at empirically testing a set of hypotheses derived from the propositions put forth in the second part of chapter one's theoretical development. Therefore, it seeks to answer questions, such as, who is responsible for ensuring that all network members meet the necessary corporate sustainability standards in order to adequately fulfill the demands of stakeholders? Why do some firms engage in corporate sustainability and others do not? What contributes to the effective diffusion of corporate sustainability in a supply network? These hypotheses are tested on a sample of 10,728 firms in the automotive sector, linked by 45,044 inter-firm relationships. Strong support for our hypotheses provides both researchers and managers with an interesting discussion of how

this emerging business paradigm, where corporate sustainability is becoming the norm and no longer the exception, may have significant implications on how value chains are structured within this sector.

*In Memoriam of
my Father
Pedro Gil Perin de Góes
11.30.1948 – 10.2.2012*

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CHAPTER 1.
MANAGING SUSTAINABILITY BEYOND CORPORATE BORDERS:
THE DIFFUSION OF CORPORATE SUSTAINABILITY IN
GLOBAL SUPPLY NETWORKS

1.1. Introduction

High profile corporate blunders, such as Nike's sweatshop crisis in the 1990s, ethical controversies involving Walmart's displacement of smaller businesses during the mid-2000s, BP's Deepwater Horizon oil spill in 2010, and, most recently, Volkswagen's emissions scandal in 2015, are but a few examples of the kinds of events that have raised stakeholders concerns and put them on alert. Consequently, there has been an intensification in the levels of scrutiny and pressure on firms to consider the social and environmental implications of their activities and to have these issues addressed in both their long- and short-term strategies (Carter and Rogers, 2008; Linton, Klassen, and Jayaraman, 2007; McIntyre, 2007; Seuring and Müller, 2008).

In the early 1980's, a rapid increase in the adoption of global sourcing practices took place, which led to significant transformations in the traditional value chain model, as well as in the global competitive environment. Value chains, which in most cases were once totally encompassed by single, vertically integrated organizations, came to be characterized as globally dispersed networks of independent buyers and suppliers, where each of these firms plays a specific role in performing the value-adding activities that will ultimately result in that value chain's final output (Hajmohammad and Vachon, 2016). In turn, these global buyer-supplier networks became so pervasive that managers who were once concerned with inter-firm competition must now be concerned with inter-network competition. Sustainability's rise to prominence as a major area of concern and study,

which began in the late 1980s, eventually, led stakeholders to realize that the changes through which value chain structures underwent had important implications in the way sustainability issues were perceived and addressed.

As a result, stakeholders began to shift the focus of their concerns over sustainability from the practices of individual focal firms towards those of entire global supply networks (Krause, Vachon, and Klassen, 2009). Stakeholders have also begun to evaluate the role of firms in relation to society in general, no longer accepting the creation of shareholder wealth to be their sole purpose and measure of performance. They began to demand that firms consider the impacts they have on the environment and on society as they develop their strategies, and as imperative criteria in the evaluation of their performance. These demands are elegantly encapsulated in a concept born under the aegis of the accounting literature, but was quickly assimilated in other areas. The concept of the Triple Bottom Line (TBL) was developed as an alternative to the single bottom line, which in accounting represents the financial results of a firm, after all the revenues and costs have been taken into account (Elkington, 1998). The TBL dictates that, in addition to economic performance, firms must consider their environmental and social performances. For many, this relatively simple idea has come to symbolize a paradigm shift in terms of how businesses should be perceived and judged now and in the future (Marshall, Vaiman, Napier, Taylor, Haslberger, and Andersen, 2010).

Despite the rapidly growing body of literature on this topic, important considerations must still be made. Scholars in this area have called for further advances and the consolidation of the systemic issues pertaining to sustainability, purchasing, and supply (Linton et al., 2007), as well as for the development of conceptual theory in the area

(Ashby, Leat, and Hudson-Smith, 2012; Carter and Easton, 2011). More recently Howard-Grenville, Bukle, Hoskins, and George (2014) called for further studies on potential alterations in interorganizational relationships, contracting, and risk mitigation approaches introduced by shifts in supply chains, and resulting from the introduction of sustainability constraints into the management of such networks.

We address these general concerns by focusing on two main questions regarding the growing importance of sustainability in global supply networks: (1) What is the strategic relevance of corporate sustainability diffusion in global supply networks for different firms in the network? (2) What are the determining factors that explain a firm's capacity and performance in diffusing corporate sustainability within its supply network?

We begin by providing a literature review that contextualizes and justifies the importance of this topic. We then move onto our theoretical development, which is composed of two parts, respectively addressing questions 1 and 2 above.

Part one of the theoretical development section fills two important conceptual gaps present in the current literature in order to establish a more solid foundation for the subsequent arguments. The first gap we address and, therefore, our first theoretical contribution, relates to fact that the current definition of supplier sustainability risk fails to provide a conceptual explanation as to why firms that are more highly exposed to stakeholder scrutiny should necessarily face a higher risk of being held responsible for the sustainability-related misconducts of lesser exposed members of the network (i.e. supplier sustainability risk). To remedy this problem, we introduce a conceptual link between higher levels of stakeholder exposure and supplier sustainability risk, in order to establish a more solid cause and effect relationship between these two phenomena.

The second conceptual gap addressed in this study relates to the dichotomous categorization of corporate sustainability initiatives as either mandatory or voluntary. The recognition of this problem arose when we observed that certain firms seem to voluntarily adopt particular corporate sustainability initiatives, which we would expect them to reject unless they became mandatory. Hence, our second theoretical contribution relates to the identification and definition of a third corporate sustainability initiative archetype, to which we refer as semi-voluntary initiatives. We then argue that supplier sustainability risk manifests itself more intensely in cases concerning semi-voluntary initiatives.

In part 2, we make a third theoretical contribution by introducing a theoretical framework to explain the existing heterogeneity among different firms within a supply network in regards to their ability to implement the diffusion of corporate sustainability initiatives in the network. We refer to this capacity as network dominance and propose that it results from the interaction among three network-related firm characteristics: relative resource value, resource substitutability, and relative network position. Each of these constructs is built on resource dependence theory, the resource based view of the firm, and network analysis, respectively.

Lastly, our final contribution comes from providing a conceptual explanation for why firms that are more dominant within their networks are likely to successfully promote and ensure the diffusion of corporate sustainability.

We conclude the paper by highlighting the potential managerial implications of the ideas here developed, providing a critical examination of the theory's limitations, and making suggestions for future research.

1.2. Literature Review

1.2.1. Foundations of Corporate Sustainability

From a firm perspective, being sustainable means to be able to survive and to sustain a certain level of performance over time. The neoclassical view of firm performance refers solely to the firm's ability to generate shareholder value; therefore, in this tradition, corporate sustainability would also remain restricted to the firm's ability to continuously generate economic profits.

Since the latter half of the twentieth century, the scientific community and other stakeholders have continuously called attention to the risks associated with human activities in relation to the social and natural environments, focusing especially on the negative externalities caused by industrial activities. In 1987, the World Commission on Environment and Development (WCED) produced a report entitled "Our Common Future", often referred to as the Brundtland report. This document, which emphasized the interdependence of nations, served as a call for multilateral collaboration and action in searching for a path to sustainable development. It also put forth a definition of sustainable development, which is perhaps the most widely quoted characterization of this concept (Ashby et al., 2012). The report describes it as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43). This definition outlines a change in perspectives regarding the role of firms in society, as well as a reinterpretation of the meaning of performance, from a purely economic measure to one that incorporates both social and environmental considerations (Winter and Knemeyer, 2013).

This new interpretation of firm performance is elegantly encapsulated in the concept of the Triple Bottom Line (TBL) (Elkington, 1998), which was originally developed under the aegis of the accounting literature to make a distinction between the financial bottom line as a single measure of value creation, and one that also considers value creation and destruction in social and environmental terms (Winter and Knemeyer, 2013). As Carter and Rogers (2008) point out, the TBL concept suggests that firm activities should be aimed at the intersection among economic, social, and environmental performances, where firms would have positive effects on society and the environment, while generating long-term profits.

The incorporation of this sustainability mandate represents a paradigm shift (Marshall et al., 2010). As society moves away from the old perception that firms could ignore resource scarcity and the limits of economic growth because technology would indefinitely provide the cure for all sustainability-related problems (Hahn and Kühnen, 2013), to a new worldview where in order to remain competitive, firms must reevaluate their definition of performance from a TBL perspective, and thus, include in their corporate strategies the development and implementation of sustainability initiatives (Winter and Knemeyer, 2013).

1.2.2. Emergence of Global Supply Networks

The last few decades witnessed the process of globalization significantly increase the pace and geographical scope of business activities and environments (Hult, 2004; Mudambi and Venzin, 2010). In turn, many firms seeking to increase competitiveness through lower costs realized that by engaging suppliers, partners, and customers outside national borders, not only would they lower production costs, but they would also be able

to create considerable value to their own firms (Connelly, Ketchen, and Hult, 2013) through the incorporation of new skills and technologies into their value chains and access to knowledge and capabilities that would not be available otherwise (Dyer and Singh, 1998; Kotabe, Mol, and Ketkar 2008; Quinn, 1999). This realization led global sourcing to be regarded as critical for the creation and the maintenance of competitive advantages, causing its widespread adoption (Kotabe and Mudambi, 2009).

There are two leading schools of thought related to the efficacy of global sourcing. The first contends that activities ensuing from global sourcing have enabled successful firms to develop dynamic global supply networks (Miles and Snow, 1986), which have allowed firms to specialize in their core activities in a system where they complement one another to achieve a common end goal (Kotabe and Mudambi, 2009). The second school of thought also recognizes the opportunities created by global sourcing, but it is more cautious in relation to potential negative consequences, especially with respect to the erosion of a firm's core competences which, due to the lack of continuous development may ultimately fall into obsolescence (Kotabe and Mudambi, 2009; Kotabe et al., 2008; Kotabe and Murray, 2004; Kotabe, 1998).

1.2.3. From Individual to Network Sustainability

The emergence of global supply networks as the dominant structure of modern value chains, has profoundly modified the rules for firm interaction, collaboration, and competition. Value chains based on domestic and integrated manufacturing taking place within wholly owned facilities, have now been replaced by ones structured as networks of independently owned buyers and suppliers dispersed around the world, each conducting separate, but complementary value adding activities. Concomitantly, stakeholders, which

Freeman (2002) defines as “*any group or individual that can affect or is affected by the achievements of the organizations objectives*” began to recognize an inherent connection between the management of global supply networks and sustainability, and that sustainability concerns can no longer be restricted to individual focal firms and their domestic markets. The disaggregation of value chains now demands that these issues be addressed at the global network level (Andersen and Skjoett-Larsen, 2009, Krause et al., 2009; Winter and Knemeyer, 2012).

This shift in perception has led a variety of stakeholders to become more interested in the environmental and social aspects of international business, turning the attention of the media, academia, and managers to concepts such as supply chain sustainability (Andersen and Skjoett-Larsen, 2009). Consequently, stakeholders, such as consumers, shareholders, non-governmental organizations (NGOs), governments and public authorities, trade unions, and supra-national organizations, have increased their levels of scrutiny and pressure over firms, to adopt better postures with respect to sustainable development (Andersen and Skjoett-Larsen, 2009; Hall, 2000). Moreover, due to the much greater availability and ease of access to information, stakeholders are now more capable of monitoring the actions of organizations (Stohl, Stohl and Popova, 2009).

This shift has also been reflected in academia with the emergence of sustainable supply chain management (SSCM) as a legitimate field of study. Carter and Rogers (2008) propose a definition, which succinctly connects the coordination of interfirm relationships within the network with the long-term perspective regarding both individual and collective performance improvements in terms of the all three dimensions of the triple bottom line (TBL).

The strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key interorganizational business processes for improving the long-term economic performance of the individual company and its supply chains."
(Carter and Rogers, 2008, pp 368)

In tandem with the concept of SSCM, scholars have pointed out that, as non-isolated entities, firms largely influence one another. Hence, to gain a better understanding of the sustainability-related issues resulting from industrial activities, systemic approaches must be employed (Madu, Kuei, and Winokur., 1995; New, Green, and Morton, 1997; Hall, 2000).

1.2.4. Stakeholder Exposure and Pressure

The concept of stakeholder pressure refers to the extent to which stakeholders perceive focal firms as responsible, and therefore, hold it accountable for the consequences of their activities (Wolf, 2013). Moreover, since the extent of this responsibility depends on the perception of stakeholders, it will likely be related to the number and kinds of stakeholders to which the firm is exposed, thus, making the intensity of these pressures to be directly related to how perceptible, or visible the focal firm is to each of its stakeholders (Hahn and Kühnen, 2013; Hall, 2000).

The factors that contribute to stakeholder exposure may be external or internal to the firm. Although a number of external factors have been identified as potential sources of stakeholder exposure, empirical data only show consistent results for corporate visibility and sector affiliation. The same is true internally, where only corporate size has yielded reliable results (Hahn and Kühnen, 2013).

Literature uses supply/value chain position, media exposure, and brand-related aspects as proxy measures for corporate visibility (Hahn and Kühnen, 2013; Hall, 2000). Firms located far enough downstream in the value chain, which are close, or have direct contact with end consumers will be highly visible, while producers of intermediate products will be less visible to stakeholders (Groves, Frater, Lee, and Stokes, 2011; Haddock, 2005). Therefore, business-to-consumer companies will be more exposed than business-to-business ones, implying that the former will be under more intense pressures from stakeholders (Hall, 2000).

“Consumer pressure is almost entirely focused on recognizable consumer goods, often associated with large multinational companies.” (Hall, 2000, pp. 459)

Media exposure increases firm visibility by making stakeholders aware of what the firm is and what it does. Good press may have very positive effects, but if the coverage of the firm is negative, it may have serious risks to the firm’s reputation (Hahn and Kühnen, 2013). Finally, the visibility generated by brands is closely related to media exposure, as it is usually measured by how often the firm is covered in the news (Hall, 2000).

Sector affiliation is the most frequently addressed external factor. Industries with the potential to generate more significant damage to society or the environment are usually observed more carefully. Consequently, companies belonging to such industries also face higher exposure to stakeholder scrutiny (Hahn and Kühnen, 2013; Parsa and Kouhy, 2008; Sotorrío and Sánchez, 2010).

Regarding internal factors, only studies on corporate size (e.g. total assets, turnover, sales, number of employees, or market capitalization) have yielded consistent and reliable

results regarding its effects on stakeholder exposure. In short, results indicate that larger firms face higher levels of stakeholder exposure. Albeit internal, corporate size is also a closely related factor to visibility, since the larger the firm, the more visible it is (Hahn and Kühnen, 2013).

1.2.5. Supply Chain Risks

Aware of the risks involved in failing to address these evolving stakeholder demands, a growing number of firms, mostly large multinationals, have implemented a series of corporate sustainability initiatives and strategies aimed at improving the quality and transparency of corporate sustainability in their supply networks. However, despite these efforts there is still a large gap between what has been accomplished and what it needs to be done (Andersen and Skjoett-Larsen, 2009).

Extant literature on operations management and sustainable supply chain management identify three general classes of supply-related risks: coordination risk, disruption risk, and supplier sustainability risk. The first refers to the coordination of multiple supply chain members in terms of supply and demand in order to avoid compromising the firm's volume and earnings (Souza, Zhao, and Chen, 2004), while the second alludes to potential failures or disruptions of internal and external processes caused by unexpected events (Kleindorfer and Saad, 2005). The third class of risk is defined by the possibility that violations of ecological and social norms by a focal firm's suppliers may adversely affect the firm's reputation (Hajmohammad and Vachon, 2016).

As stakeholders have become more intensely focused on issues pertaining to network-wide sustainability, negative business practices of a focal firm's key suppliers can damage its corporate reputation and have serious strategic consequences for the firm, such

as business disruption, interruption, or at the extreme, business failure (Wright, 2007). The concept of supplier sustainability risk is a type of reputational risk, which has only recently emerged in the literature (Hofmann, Busse, Bode, and Henke, 2014; Jiang, Baker and Frazier, 2009; Roehrich, Grosvold and Hojmoose, 2014).

Therefore, based upon previous definitions, the concept of supplier sustainability risk can be described as involving a condition or event generated by a member of a focal firm's supply network, which may be perceived by stakeholders as harmful to society and/or the natural environment, thus, causing stakeholder reactions that may be harmful to the focal firm's image and reputation, and potentially disrupting its operations (Hofmann et al., 2014; Hajmohammad and Vachon, 2016).

Hajmohammad and Vachon (2016) further describe supplier sustainability risk as the result of the cumulative likelihood that: (1) a member of the focal firm's supply network engages in a sustainability-related misconduct; (2) the misconduct is detected by concerned stakeholders; (3) these stakeholders decide to communicate it broadly, all take place and are subsequently followed by their consequences (Roehrich et al., 2014). This is relevant because the extent to which these unfavorable consequences affect the firm is highly dependent upon the firm's visibility, the importance stakeholders attribute to the issues in question (Reuter, Foerstl, Hartmann, and Blome, 2010), the industries involved (Neef, 2004), the location of the supply base, and how damaging the media coverage is (Hajmohammad and Vachon, 2016).

1.2.6. Types of Corporate Sustainability Initiatives

Literature divides corporate sustainability initiatives in two categories, mandatory and voluntary (Hahn and Kühnen, 2013; Linton et al., 2007; Peters, Hofstetter, and

Hoffmann, 2011). A mandatory initiative refers to the obligatory adherence to existing, pre-defined external rules and regulations. These rules can be formal and explicit regulations—such as rules and standards set by governments—which, if not followed, may result in various types of fines and sanctions, which are set according to known parameters (e.g. the laws of the country), and with the nature of the infraction. Mandatory initiatives may also be less formal and/or explicit, as is the case of industry self-regulation, where industry participants agree to follow a certain regiment based on their views and on meeting the demands of strategic stakeholders (Hahn and Kühnen, 2013; Linton et al., 2007; Peters et al., 2011). Thus, the motivation behind mandatory initiatives is based on the firm's need for legitimation before its external stakeholders. Legitimacy theory suggests that an organization's right to exist depends on its acceptance by society. Legitimation, therefore, refers to the firm being granted, a “license to operate” (Deegan, 2002) by its stakeholders, making it a valuable, if not fundamental resource (Dowling and Pfeffer, 1975; Ashforth and Gibbs, 1990; Suchman, 1995). Nevertheless, if the company operates in ways that stakeholders find unacceptable, the firm's legitimacy, and consequently, its survival may be put in check (Hahn and Kühnen, 2013).

Conversely, voluntary initiatives refer to actions that, rather than complying with pre-determined rules and regulations, seek to surpass those requirements, and are often referred to as “beyond compliance.” Voluntary initiatives can be further divided into two sub-categories, those focused on increasing competitiveness and those focused on social responsibility (Bansal and Roth, 2000; Linton et al., 2007; Peters et al., 2011). These initiatives are motivated and defined within the company, rather than imposed by external agents. Therefore, well-developed voluntary initiatives are unlikely to generate external

negative consequences to the firm, such as fines, lawsuits, or damage to the firm's reputation. On the contrary, such initiatives are likely to exceed external stakeholders' expectations. As sources of competitive advantage, such initiatives are motivated by profitability, which is usually achieved through brand and/or product differentiation, often in the form of newer technologies and standards that are more efficient and less damaging to society and the environment, and the adoption of such technologies and standards as ways to anticipate or influence future compliance requirements. There are also firms that are motivated by a sense of social responsibility. In such cases, the firm's constituent focus is society as a whole, and the implementation of voluntary corporate sustainability initiatives has a positive effect on corporate morale as they fulfill the purpose pursuing the good for society (Bansal and Roth, 2000; Linton et al., 2007; Peters et al., 2011).

These corporate sustainability initiative archetypes also differ in terms of their decision analysis, decision target, and strategic focus. The firm's analysis of whether to comply with the rules and regulations that have been imposed upon it will compare the costs of compliance against the costs and risks of non-compliance, and its decision will be based on the meeting the minimum requirements that will satisfy its stakeholders. Finally, it has an isomorphic/imitative strategic focus, since its goal is to conform to, and not exceed, previously established corporate sustainability standards (Bansal and Roth, 2000).

Concerning competitiveness-oriented voluntary corporate sustainability initiatives, its decision analysis is purely based on the costs and benefits expected from the initiative, and its decision target is profit maximization. The focus of its strategy is innovative since the objective of such an initiative is for the firm to differentiate itself from its competitors, either through its posture and reputation, or through the employment of technological

innovations. Alternatively, voluntary corporate sustainability initiatives oriented towards social responsibility analyses its decisions based on social and ecological values, since their ultimate target is reaching an ideally sustainable society (Bansal and Roth, 2000).

1.2.7. Diverging Incentives towards Corporate Sustainability Diffusion

Literature suggests that focal firms and non-focal firms have diverging incentives and objectives regarding the adoption and diffusion of corporate sustainability initiatives. By definition, focal firm(s) are those at the center of the supply network, meaning that they are the most important and influential actors in that system, and as such, they command the dynamics in the supply network (van Bommel, 2011; Chen and Paulraj, 2004; Gereffi, 1999; Lambert and Cooper, 2000). Therefore, as the term suggests, focal firms are the focus of stakeholder attention within an industry (Hahn and Kühnen, 2013; Jacobides, MacDuffie, and Tae, 2015). Conversely, non-focal firms play more peripheral roles in the network. They are usually smaller firms, producers of intermediate products. In the same industry, their secondary roles, small corporate size, and distance from end consumers make them less visible to stakeholders. Also, there is much less interest from the media on small firms in comparison to larger ones. Hence, focal firms are much more exposed to stakeholder scrutiny than non-focal ones (Hall, 2000). Consequently, their higher exposure leaves focal firms more vulnerable to supplier sustainability risk (Hajmohammad and Vachon, 2016). Prior research suggests that smaller firms, especially producers of intermediary products hardly feel any pressure from stakeholders (Hall, 2000). According to Williams, Medhurst, and Drew (1993):

“...it is the larger firms that bear the highest costs of pollution control and that this might account for the high level of awareness and response to

environmental pressures The same pressures are clearly not felt by smaller firms and particularly many producers of intermediary products.”

(Williams et al., 1993, p. 145)

As a result, small firms do not regard environmental concerns as relevant to their business strategy. Adding to that, they face a number of disadvantages in comparison to larger firms when dealing with sustainability issues. For example, unlike larger firms, smaller firms more often than not lack the necessary resources, expertise, access to information, and ability to manage information flows, in order to engage in corporate sustainability initiatives. Due to shareholder responsibilities, legal liabilities, economies of scale, bureaucratic structures, etc., larger firms often develop mechanisms to measure and account for the majority of its activities (Hall, 2000).

Finally, focal firms usually occupy positions in the value chain where the most value is added to the final product, be it upstream or downstream, thus, they tend to appropriate more value than the other members of the network (Jacobides et al., 2015). This serves as a further disincentive for smaller firms to engage in non-profit generating activities.

In sum, although larger and more exposed firms face higher levels of stakeholder pressures, they are better equipped to address these demands. Conversely, smaller firms do not possess the necessary resources, but given their lower exposure, such pressures are usually not an issue. This suggests that when it comes to dissemination of corporate sustainability in the supply network, there is a misalignment between the objectives of these two firm categories. Focal firms will adopt corporate sustainability strategies and will

try to diffuse it to the rest of the network, while non-focal firms will resist its adoption as well as the responsibility to further diffuse it.

The term, diffusion, in the study of networks refers to the spread of “something” from the members that possess it to those that do not. Common examples can be observed when a certain video goes “viral” on social media or by the spread of an actual virus, such as H1N1, in a population. The phenomenon is first manifested in one or a few members of a network, and it spreads according to how those members are connected and/or exposed to one another (Golback, 2013).

1.2.8. Power and Corporate Sustainability Diffusion

To resolve the impasse in the diffusion of corporate sustainability in the network created by the diverging incentives that exist among focal and non-focal firms, focal firms must seek to influence the behavior of non-focal firms towards accepting the adoption and continued diffusion of corporate sustainability initiatives. Gaski (1984) calls attention to a number of definitions of power present in the literature, and points out to their high level of consistency with one another. For example, the definition below calls attention to the ability of one party to change the behavior of another.

A has power over B to the extent that A can get B to do something that B would not otherwise do (Dahl 1957).

A similar definition shifts the focus from the the party that is exerting the power, to the ability its counterpart has to resist it.

The power of actor A over actor B is the amount of resistance on the part of B which can be potentially overcome by A (Emerson 1962).

Another example makes power analogous to influence, which is then defined as one party's ability to cause "change" on another.

When an agent, O, performs an act resulting in some change in another agent, P, we say that O influences P. If O has the capability of influencing P, we say that O has power over P (Cartwright 1965).

In a more elaborate definition, Emerson (1962) proposes that power is fundamentally related to how dependent one party is on the other, and how good the dependent party's alternatives are outside that specific relationship.

... the power of A over B is equal to, and based upon the dependence of B upon A. ...The dependence of actor B upon actor A is (1) directly proportional to B's motivational investment goals mediated by A, and (2) inversely proportional to the availability of those goals to B outside of the A-B relation (Emerson, 1962. pp. 32-3).

Another relevant aspect of power that has been raised in some scholars' definition of power is perception. That is, power is not necessarily founded on concrete facts about the parties in question, but on how they perceive one another.

"...the power of O depends on the perceptions of P in terms of D's ability to satisfy P's desires..." (Beier and Stem 1969, p. 94).

Finally, French and Raven (1959, p. 155-65) proposed a detailed taxonomy on the sources of power, which remains influential to this day. According to Hall (2000), nothing of relevance has been added to this literature that French and Raven's (1959) work did not cover. Their taxonomy comprehends the following five different sources of power.

- Legitimate: B perceives A as having the legitimate right to prescribe its behavior;

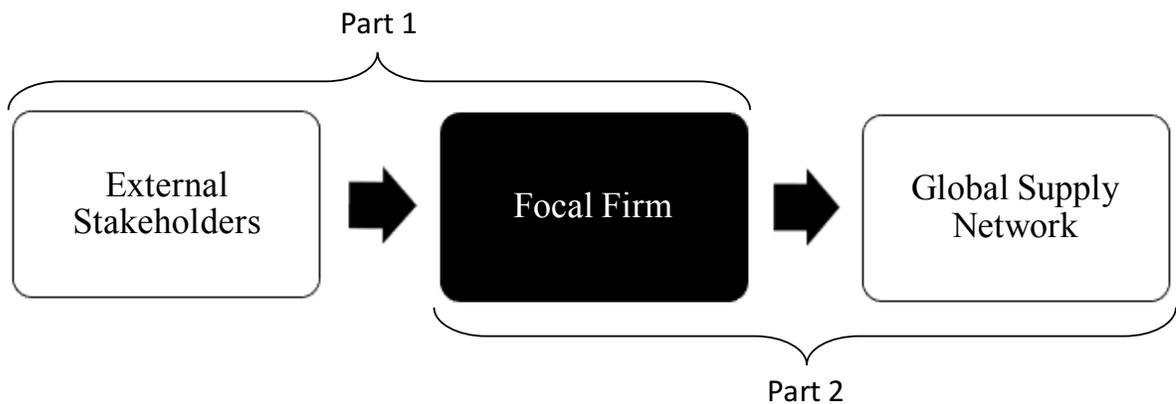
- Expert: B perceives A as having a special knowledge or expertise;
- Referent: B identifies with A;
- Reward: B perceives A as having the ability to reward it for its behavior;
- Coercive: B perceives A as having the ability to punish it for its behavior.

As we move on to the section on theory development, it is important to notice that just as focal firms use power to influence and/or pressure non-focal firms into the adoption and diffusion of corporate sustainability, the same is true of the pressures exerted by stakeholders over focal firms. Hence, before we go into how power affects the diffusion of corporate sustainability in the network, we will examine how power is used by different stakeholders to pressure focal firms to engage in different types of corporate sustainability initiatives.

1.3. Theory Development

We divide the theory development section into two parts for which we develop specific research propositions (see FIGURE 1.1).

FIGURE 1.1
Theoretical development: parts 1 and 2



Part one discusses how stakeholder pressures transform the diffusion of corporate

sustainability in global supply networks into a strategic imperative to focal firms. In doing so, it discusses the necessity for a conceptual link between asymmetries in stakeholder exposure amongst a network's focal and non-focal firms, and the manifestation of supplier sustainability risk (See FIGURE 1.2). It also proposes a new category of corporate sustainability initiatives, which as we discuss, should be the main concern of managers in regards to supplier sustainability risk (See TABLE 1.1).

Part two addresses the firm's sources of network dominance, and discusses how a firm's ability to deploy different types of power as the basis of its strategy for corporate sustainability diffusion in the network will improve diffusion performance (See FIGURE 1.3).

1.4. Part One – The Imperative of Corporate Sustainability Diffusion to Focal Firms

1.4.1. Stakeholder Exposure and Supplier Sustainability Risk

Extant literature suggests a direct relationship between the levels of stakeholder exposure and supplier sustainability risk to which a firm is subjected (Hajmohammad and Vachon, 2016; Neef, 2004; Reuter et al., 2010). Stakeholder exposure refers to how perceptible and/or recognizable a firm is to its various stakeholders. Internally, the most relevant determinant of a firm's level of exposure is its corporate size, measured as total assets, turnover, sales, number of employees, or market capitalization. Externally, the main determinants cited in the literature are sector affiliation, and corporate visibility (measured as supply/value chain position, media exposure, and brand-related aspects). Since focal firms are often the largest and most highly visible members of its supply network, their

activities are also often the ones most exposed to stakeholder scrutiny (Hahn and Kühnen, 2013).

Supplier sustainability risk can be characterized as the harm that may potentially be done to a firm's reputation ensuing from an unsustainable condition or event created by another member of its supply chain (Hofmann et al., 2014; Hajmohammad and Vachon, 2016). Moreover, as a potential event, its likelihood is determined by the cumulative probabilities that (1) a member of the focal firm's supply network engages in a sustainability-related misconduct; (2) the misconduct is detected by concerned stakeholders; (3) these stakeholders decide to communicate it broadly (Hajmohammad and Vachon, 2016; Roehrich et al., 2014).

In this study, we propose that although the argument for this relationship between stakeholder exposure and supplier sustainability risk makes intuitive sense, upon further examination, it fails to establish a connection between the occurrence, detection, and disclosure of a sustainability-related violation by a member of the network, and the blame necessarily falling upon the focal firm. Benoit (1995) suggests that for that blame to befall on the focal firm and cause damage to its reputation, it is necessary that stakeholders attribute the said misconduct to the focal firm. Hence, our question becomes what leads stakeholders to attribute such misconducts to the focal firm, which *de facto* transfers the accountability from the perpetrator of the actions to the focal firm. We argue that stakeholder exposure increases the risk of the focal firm's actions being scrutinized, thus leading to a higher probability that its own violations may be discovered and disclosed, but that exposure does not necessarily link the focal firm to the actions of other players in the network. Hence, as the current argument stands, it lacks a conceptual link to explain why

stakeholders attribute the behavior of a non-focal firm to the focal firm.

1.4.2. Negative Performance Inseparability

To fill this conceptual gap, we borrow from Chen (2005) the concept of performance inseparability, or rather, negative performance inseparability as the missing link between stakeholder exposure and the manifestation of supplier sustainability risk, as illustrated in FIGURE 1.2.

FIGURE 1.2
Stakeholder exposure asymmetry, negative performance inseparability, and supplier sustainability risk



Chen (2005) applied this concept to the discussion of contractual co-marketing, where he recognizes that in most cases involving the co-marketing of a product by two specialist firms, their performances, or value contributions to the final product are joint and hence inseparable, from the perspective of the product's final consumers. In this study we apply this idea not only to end consumers, but to the firm's various stakeholders. Furthermore, we employ the term performance to refer to the role(s) or actions performed by the firm within the value chain, more specifically, those related to social and environmental sustainability.

The inability to distinguish among the various players present in a value chain leads stakeholders to assign judgment for the collective actions of the value chain to the firm that is most exposed to them, or, the focal firm. The concept of performance inseparability can be divided into positive and negative performance inseparability. Positive performance

inseparability occurs when the focal firm is credited with the positive performance of another, less exposed member of the network. Conversely, negative performance inseparability refers to cases when the focal firm is held responsible for the negative performance of another party within the network. Prior research has shown that stakeholders display more sensitive responses to negative sustainability behaviors than they do in regards to positive behaviors (Bhattacharya, Korschun, and Sen, 2009).

A good example of negative performance inseparability is found in Nike's notorious cases of labor rights violations in the 1990s, where the company was blamed by NGOs and consumers for the low wages and poor working conditions in some of its factories in Indonesia, Cambodia, Pakistan, China and Vietnam, which had devastating, and long lasting effects on Nike's reputation. In a speech to National Press Club in May of 1998, Phil Knight, Nike's founder and CEO at the time lamented, "the Nike product has become synonymous with slave wages, forced overtime, and arbitrary abuse". It is also curious that the ability to create a global network of suppliers in countries with low labor costs, which enabled Nike to become a leader in the apparel industry, almost led to the firm's own demise as sustainability concerns rose to prominence (Locke, 2002).

As expected, it took years and a lot of investment for Nike to revert this situation, but after learning it the hard way, it has become a leader in sustainable supply chain management today (Lim and Phillips, 2008; Webb, 2007).

In FIGURE 1.2, negative performance inseparability serves as a mediator between stakeholder exposure and supplier sustainability risk for two reasons. First, performance inseparability can only exist in situations where stakeholder exposure is asymmetric among the firms in the network. In other words, if stakeholders are able to perceive all network

members by employing the same level of effort, and a violation is observed, then the responsible party must be identifiable, thus, eliminating performance inseparability.

Therefore, we propose that:

Proposition 1. The higher the focal firm's level of stakeholder exposure in comparison to those of the non-focal members of the network, the higher the likelihood that stakeholders will be unable to distinguish between the corporate sustainability performance of non-focal firms from that of the focal firm.

The second reason is that the inability of stakeholders to correctly distinguish among the activities of the different members of a network (i.e. negative performance inseparability), creates a propensity on the part of these stakeholders to mistake the part for the whole, that is, to perceive the focal firm as responsible for any sustainability related violations taking place within the network (i.e. supplier sustainability risk). Thus, proposition two states that:

Proposition 2: The more difficult it is for stakeholders to distinguish between the corporate sustainability performance of non-focal firms from that of the focal firm, the higher will be the level of supplier sustainability risk faced by the focal firm.

1.4.3. Corporate Sustainability Initiative Archetypes and Power

To gain a more complete understanding of the implications of propositions one and two, we reexamine and expand the dichotomous categorization of corporate sustainability initiatives into mandatory and voluntary ones, and propose a third category, to which we refer as “semi-voluntary” corporate sustainability initiatives.

We formally define semi-voluntary corporate sustainability as unwilling corporate responses to the demands of stakeholders without the legitimate power to enforce them, but whose reactions may have consequences on the firm's reputation, legitimacy and survival of a very serious nature. Given their capacity to threaten the very survival of the

firm, these stakeholders are, therefore, endowed with the coercive power necessary to influence the firm's behavior.

Researchers have observed that the pressures exerted by non-regulatory stakeholders, such as environmental advocacy groups, neighboring communities, and consumers have an impact on the environmental performance of firms (Hall, 2000). In practice, these pressures mean an increase in the potential costs of being perceived by stakeholders as acting unsustainably. Hence, semi-voluntary corporate sustainability initiatives are, in effect, hedging against potential backlashes from stakeholders that, despite their lack of legitimate power to impose certain behaviors upon firms, will use other means at their disposal, as sources of power (e.g. negative campaigns, protests, and consumer boycotts) to hold firms accountable for the social and environmental costs caused by their activities (Hajmohammad and Vachon, 2016).

TABLE 1.1 lists the basic characteristics of all three types of initiatives, with the grey row referring to the attributes of the newly proposed semi-voluntary initiatives. Also, for the sake of simplicity, we condense the power taxonomy proposed by French and Raven (1959), from five power types into three: (1) legitimate power; (2) coercive power, which includes both the coercive and reward power types; (3) cooperative power, which encompasses both referent and expert powers. The justification for why we grouped power in this way has to do with the intensity with which these powers are able to direct the behaviors of those firms over which they are employed.

TABLE 1.1
Semi-voluntary corporate sustainability initiatives

Types of CS initiatives*	Motivation**	Ends**	Means**	Constituent focus**	Decision analysis**	Decision target**	Strategic focus**	Overall strategic alignment	Stakeholder Power***	Stakeholders' access to supply network information
Mandatory	Legitimation ↕	Firm survival ↕	Compliance with norms and regulations	Governments and other regulatory stakeholders of recognized legitimacy	Costs and risks of noncompliance ↕	Satisfice ↕	Isomorphic/initiative ↕	Misaligned ↕	Legitimate	High
Semi-voluntary	Legitimation ↕	Firm survival ↕	Responding to stakeholder demands	Concerned, non-regulatory stakeholders in general	Costs and risks of noncompliance ↕	Satisfice ↕	Isomorphic/initiative ↕	Misaligned ↕	Coercive & Cooperative	Low
Voluntary	Competitiveness	Profitability	Competitive advantage	Customers, investors	Cost-benefit analysis	Maximize	Innovative	Aligned	No stakeholder pressure	Irrelevant
	Social responsibility	Corporate morale	Social good	Society	Social and ecological values	Idealize	Independent			

* Hahn and Kühnen, 2013; Linton et al., 2007; Peters, Hofstetter, and Hoffmann, 2011

** Bansal and Roth, 2000

*** French and Raven, 1959

1.4.4. Semi-Voluntary vs. Voluntary Corporate Sustainability Initiatives

In comparing the characteristics of voluntary initiatives and those of our proposed semi-voluntary ones, we observe that they differ in practically every single respect. There is, however, an implicit and fundamental characteristic shared between these two initiative archetypes, which is that there are no legitimate, obligatory sets of norms and regulations binding firms to the implementation of either type of initiative; hence, a decision against their implementation would not subject the firm to being punished or censored through the use of legitimate power. Among their many differences, the last two (grey columns) are of special interest to our discussion. The first is that voluntary initiatives are aligned with the firm's overall strategy, since, unlike semi-voluntary initiatives, firms are still likely to implement them even in the absence of external pressures, which, in fact, is the exact case in point. These voluntary initiatives are internally motivated either by the desire to gain competitive advantage, or by an internal sense of duty towards society and the environment, and not by external pressures from stakeholders, which may not expect, or be aware of, the firm's plans. Here, the words of Apple Computer's late CEO Steve Jobs that "*Consumers don't know what they want until you show it to them*" provide a parallel between the launch of disruptive innovations, such as the iMac and the iPhone, and the implementation of voluntary corporate sustainability strategies. Voluntary initiatives are only perceived by stakeholders once the firm announces or implements them. It implies that unless stakeholders perceive an initiative as necessary, they will not pressure firms to implement it. Absent stakeholder pressure, supplier sustainability risk does not exist, which, in turn, removes the necessity for focal firms to diffuse its voluntary initiatives in the supply network.

1.4.5. Semi-Voluntary versus Mandatory Corporate Sustainability Initiatives

Distinct from the previous comparison, mandatory and semi-voluntary corporate sustainability initiatives share a number of characteristics, as indicated by the arrows in TABLE 1.1. In both cases firms are motivated by the need to gain legitimacy in relation to their stakeholder base in order to guarantee their survival. The decisions to implement either initiative type are based on the costs and risks of noncompliance, and their aim is to go only as far as to satisfy their respective stakeholder groups, and not to differentiate for the sake of creating competitive advantages. Regarding their alignment to the firm's overall strategy, we consider once again whether firms would still adopt and implement such initiatives in the absence of external pressures. The absence of economic incentives suggests that the answer to this question would be negative in both cases, thus, indicating a misalignment between a firm's implementation of either type of initiative and its overall strategy.

Despite their similarities, these two archetypes differ in three fundamental ways: (1) the firm's constituent focus, or, the stakeholders to which the initiative's implementation caters, (2) the means through which firms reach their objectives, and (3) the types of power available to their different stakeholder to hold firms accountable for their actions. These three differentiating factors play a role in the way negative performance inseparability relates to mandatory versus semi-voluntary initiatives. Consider the parallel between a firm's decision to implement these two types of corporate sustainability initiatives, and a person's decision of whether to purchase a car insurance policy that simply covers the minimum liability insurance required by law, or to pay extra for non-mandatory full coverage to be included in the policy. Minimum liability insurance

is meant to cover the health and property costs of people, other than the driver responsible for the accident. Its purchase is legally required and strictly enforced by the government. As such, in our comparison, minimum liability insurance would be equivalent to mandatory corporate sustainability initiatives, such as government regulation over the amount of carbon dioxide a factory can emit into the atmosphere, and the setting of a minimum wage as required by law. The violation of any such directives would constitute a breach of the law, for which the party held responsible may be legitimately punished.

If, however, the driver wishes to have his own property and health costs insured, he or she may opt to pay extra for full coverage. However optional, the purchase of full coverage is not purely voluntary because, in fact, the driver is hedging against the possibility that he or she may be held responsible for an accident in which the property and healthcare costs generated may exceed his or her means. Similarly, a firm may not be breaking the law when it decides not to respond to the demands of its non-regulatory stakeholders to implement a specific initiative. Nevertheless, the consequences of doing so may constitute a significant threat to firm performance and survival. For example, when Apple Computer outsourced the production of components to Foxconn in China, it was not breaking the law either in the United States or in China. However, the fact that Foxconn's labor practices drove some of its employees to commit suicide, was perceived by Apple's stakeholders, especially those in developed economies, as the company's failure to ensure the well-being of the workers within its supply network (Schiller, 2010). The fact that Apple took the initiative to remedy this situation, even if Apple had decided to address this problem prior to this very predictable stakeholder backlash, was not a mandatory course of

action. However, considering the consequences of not doing so to the firm's reputation, it was not a voluntary initiative, either.

To successfully implement a mandatory corporate sustainability initiative, a firm must comply with norms and regulations regarding corporate sustainability, which have been pre-established by stakeholders, such as governments and other regulatory organs (e.g. the World Trade Organization, United Nations, etc.), as well as informal, but binding organizations, such as to the demands of other stakeholders, which, unlike regulatory stakeholders, do not industrial associations, whose legitimacy to enforce those rules has been previously recognized.² In contrast, the success of a semi-voluntary initiative depends on how well a firm is able to respond dispose of the same legitimate power to command the adoption of such initiatives, and thus, must employ alternative means, such as consumer boycotts, wide disclosure of the firms' unsustainable practices, etc. (Hajmohammad and Vachon, 2016), in order to hold firms accountable for what these stakeholders perceive to be poor corporate sustainability performance. Therefore, these differences suggest that while legitimate power is employed in the enforcement mandatory initiatives, semi-voluntary initiatives must be enforced through the employment of alternative types of power, such as, coercive, reward, referent, or expert powers (French and Raven, 1959).

Corporate Sustainability Initiatives and Negative Performance Inseparability

A final aspect that differentiates these three initiative archetypes refers to how much negative performance inseparability affects each of their stakeholder constituent *foci*.

² Note that the constituent focus referring to mandatory initiatives on TABLE 1.1 differs from the original work of Bansal (2000), as we restricted it to include only to those stakeholders with the legitimate power to enforce these mandatory initiatives (French and Raven, 1959).

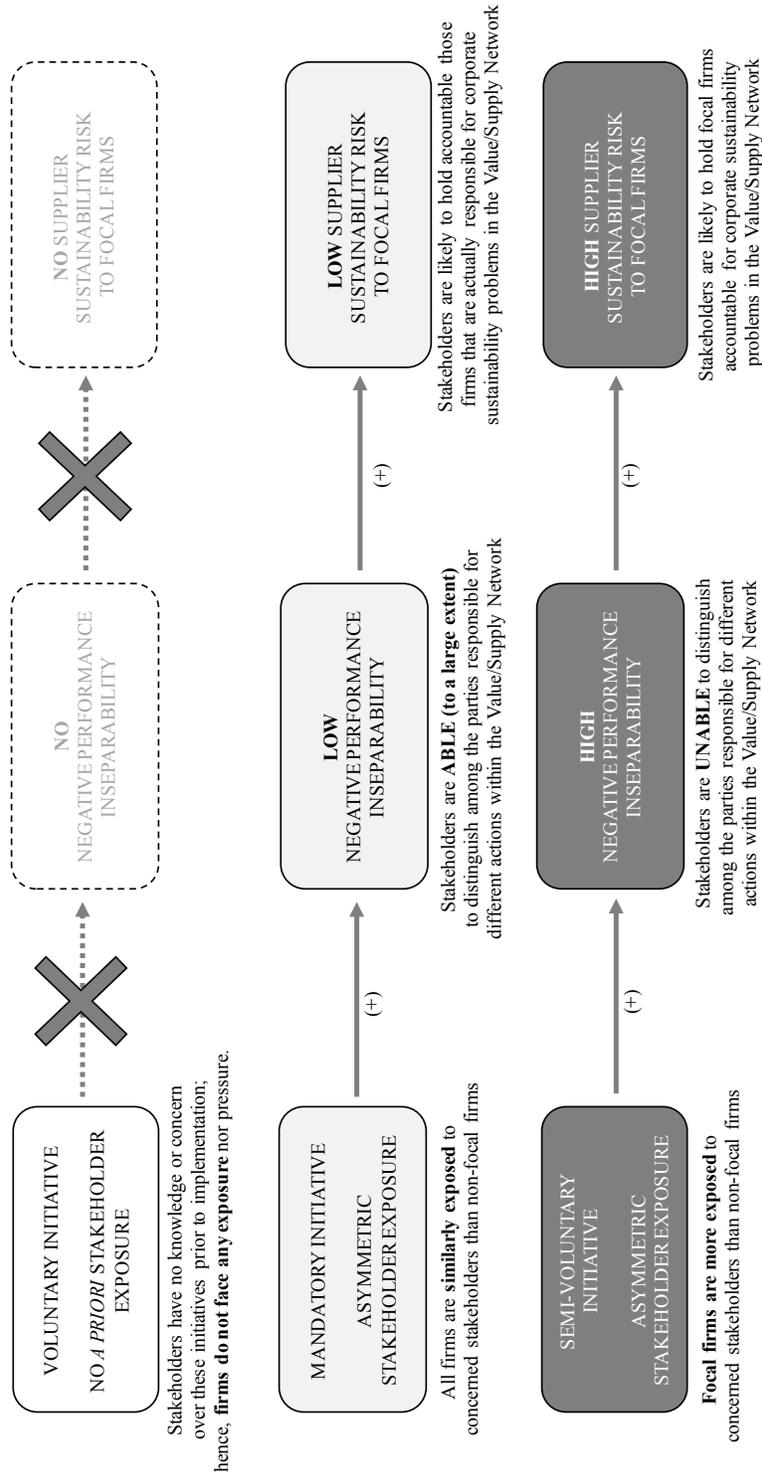
As illustrated in FIGURE 1.3, since the implementation of voluntary initiatives is internally motivated, the concerned stakeholder groups (customers, investors, and society) are either unaware or have not yet recognized the need for such initiatives. Hence, absent stakeholder expectations, both negative performance inseparability and supplier sustainability risk become irrelevant.³

Proposition 3. In voluntary corporate sustainability initiatives, the lack of stakeholder expectations and consequent pressure leads to the non-manifestation of supplier sustainability risk.

In the case of mandatory initiatives, the groups of stakeholders involved are assumed to be highly informed about the members of the supply networks in question, as well as about each firm's individual roles and activities within the value chain. This stems from the fact that these stakeholders can mandate the disclosure of firm information regarding assets, activities, performance, etc. Moreover, many of these stakeholders (e.g., governments and regulatory agencies) possess highly sophisticated professional structures to gather and process this information. Their higher access to firm information enables these stakeholders to track and discern among the various players present in a network, thus, eliminating to a large extent the asymmetries in stakeholder exposure and, consequently, significantly reducing negative performance inseparability among focal and non-focal firms.

³ Only once a firm's voluntary activities become known to stakeholders, these stakeholders may come to expect the same from other focal firms, thus, pressuring these firms to conform to them as a new standard. Therefore, to late movers, the originally voluntary initiative may assume a mandatory or semi-voluntary character.

FIGURE 1.3
Stakeholder Exposure for different Corporate Sustainability Archetypes, Negative Performance Inseparability, and supplier sustainability risk



Proposition 4. In mandatory corporate sustainability initiatives, stakeholder access to specific firm information reduces the asymmetry in stakeholder exposure, thus, lowering the level of negative performance inseparability among focal and non-focal firms and; consequently, that of supplier sustainability risk.

Conversely, restricted access to information about the individual members of value/supply networks often renders stakeholders concerned with semi-voluntary corporate sustainability initiatives unable to differentiate among the different parties in the network, leading these stakeholders to attribute the responsibility for any misconduct within the network to those firms that are most visible to them (i.e. focal firms). Hence, the judgment stakeholders make in matters concerning semi-voluntary initiatives are highly biased by negative performance inseparability. Therefore, we can infer that focal firms face lower levels of supplier sustainability risk in cases where mandatory initiatives are concerned than in those pertaining to semi-voluntary corporate sustainability initiatives. Therefore, propositions five and six state:

Proposition 5: In semi-voluntary corporate sustainability initiatives, the highly asymmetric stakeholder exposure between focal and non-focal firms raises the levels of negative performance inseparability, which, consequently, create high levels of supplier sustainability risk.

Proposition 6. Since the focal firm's incentive to diffuse corporate sustainability initiatives stems from supplier sustainability risk, semi-voluntary initiatives are likely to be most diffused types of initiatives.

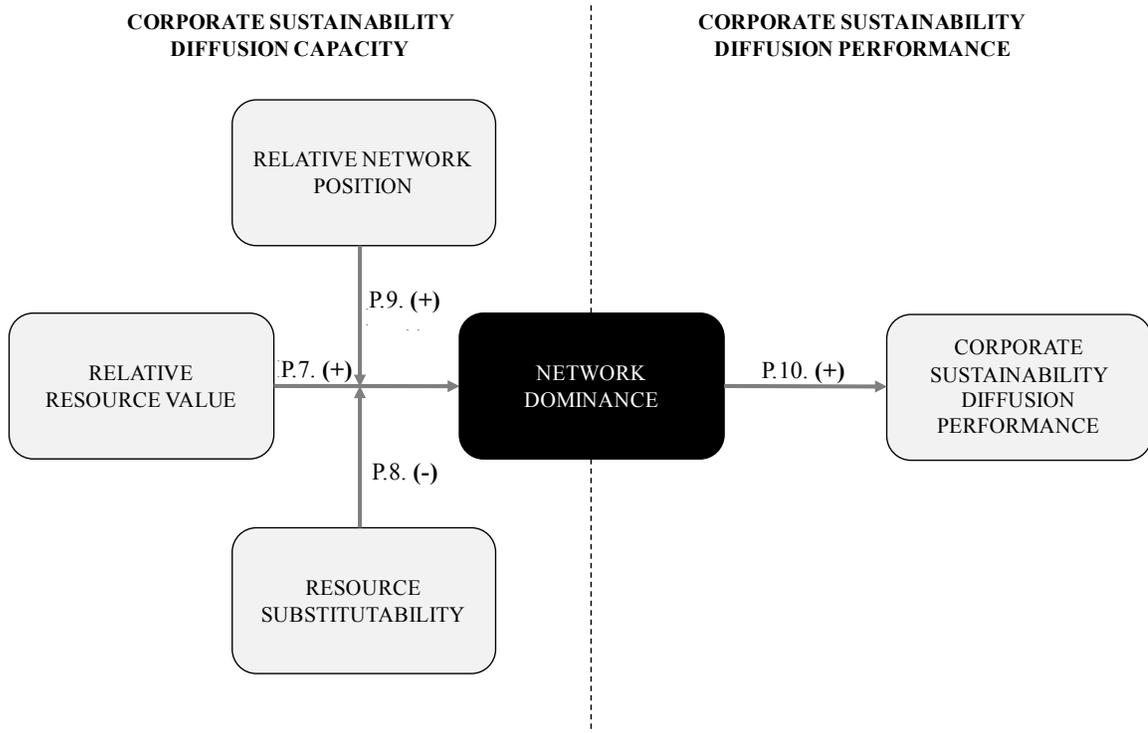
1.5. Part Two - Network Dominance and Corporate Sustainability Diffusion Performance

1.5.1. Determinants of Network Dominance

We begin by examining the factors that differentiate the firms in a network in regards to their ability to influence the behaviors of their network partners towards engaging in corporate sustainability initiatives.

We propose three network-related firm characteristics as the main determinants of a firm's network dominance, or ability to steer the behavior of otherwise unwilling network members towards engaging in corporate sustainability initiatives. These three characteristics are: relative resource value, resource substitutability, and the firm's relative position within the network structure. We propose a theoretical framework which we divided into two stages: (1) corporate sustainability diffusion capacity and (2) corporate sustainability diffusion performance (see FIGURE 1.4). The first stage describes the interaction among these three factors to determine how dominant the firm is in relation to its network. Stage two then explains the relationship between higher levels of network dominance and the likelihood of better corporate sustainability diffusion performance.

FIGURE 1.4
Network dominance, and corporate sustainability diffusion performance

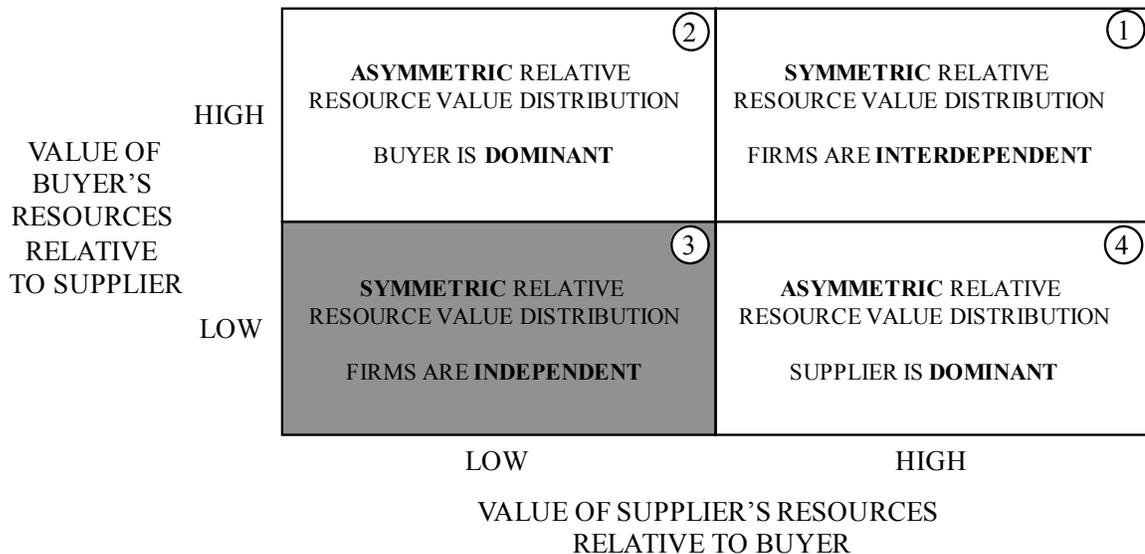


1.5.2. Relative Resource Value and Network Dominance

Resource dependence theory is based on the premise that to survive, a firm must have the ability to attain and maintain control over critical resources (Pfeffer and Salancik, 1978), and defines resources as anything that has value to the firm. It proposes that firm behavior is determined by two factors, the firm’s resource endowment and its level of resource dependence. Its endowment is defined by the resources it possesses as well as any other resources over which it exerts some measure of control, while its level of resource dependence refers to how much the firm depends on others to gain access to the resources deems valuable (Emerson, 1962; Pfeffer and Salancik, 1978). Consequently, if the resources of one firm are deemed more valuable by its counterparts, than vice versa, it implies that the firm’s counterparts are more dependent on its resources than the firm is

with respect to its counterpart's resources. This asymmetric distribution of relative resource value between the two firms, confers to the one that controls the most valuable resources a certain measure of power (Ulrich and Barney, 1984). FIGURE 1.5 shows the four basic relative resource value distribution scenarios between a Buyer B and a Supplier S, and their respective power structures.

FIGURE 1.5
Relative resource value and power structures in buyer-supplier relationships



In quadrant one, B and S are interdependent, that is, B is as dependent on S's resources, as S is on B's. Since they are equally critical to one another, there is no difference in the resource value of each firm in relation to the other, and their interaction is likely to collaborative. Quadrant three proposes a similar scenario, except that, in this case neither firm depends on the resources of the other, rendering them independent from each other and, consequently, making it unlikely that these two firms will form a supply network relationship. Since we are studying networks of interfirm relationships, the scenario

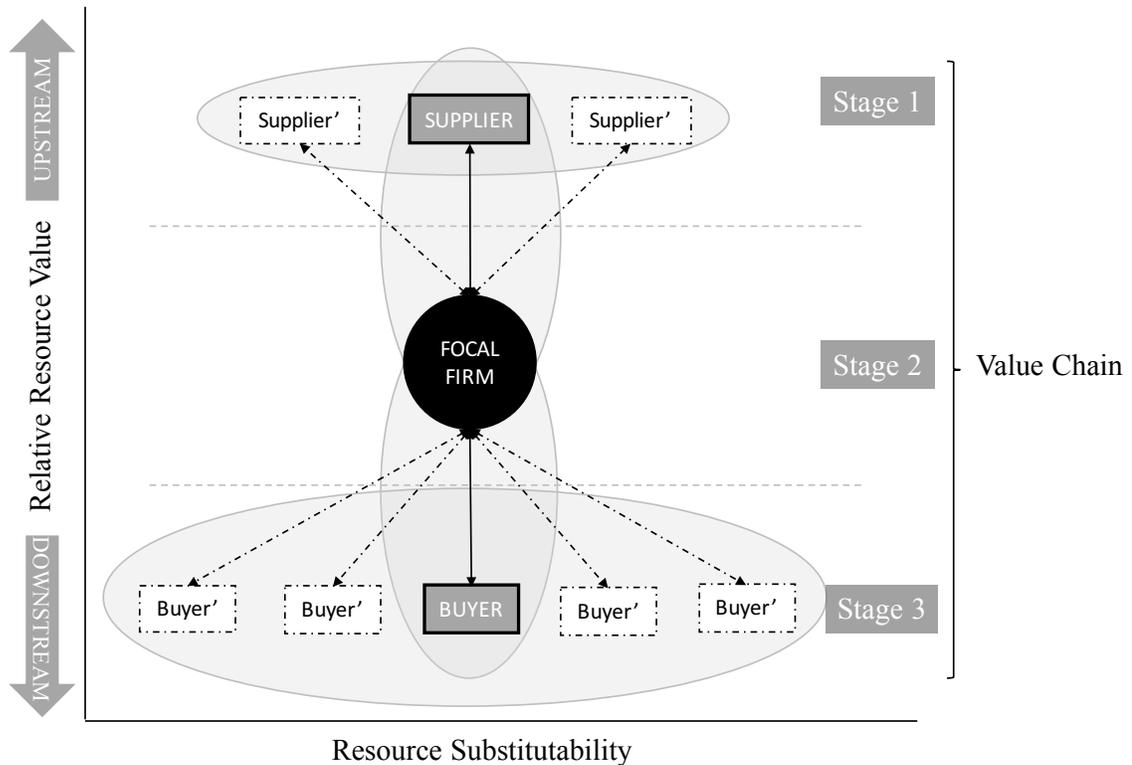
presented in quadrant three falls outside the scope of our discussion. In quadrant two, S is highly dependent on B's resources, whereas the opposite is not true. In quadrant four, that last situation presented is reversed, making B is now highly dependent on S's resources, and S depending very little on B's resources. In both cases, the firm controlling the most relatively valuable resources will exert a commensurate amount of power over the behavior of its counterpart. Therefore, proposition seven, states:

Proposition 7: A firm's relative resource value is positively related to its network dominance.

1.5.3. Resource Substitutability and Network Dominance

Our previous discussion focused on the relative value of resources between firms from a vertical perspective, that is, the value of a supplier's resources to buyer, and vice versa. What characterizes it as vertical is that it concerns relationships between firms that belong to different stages in the value chain. We now turn our attention to the horizontal dimension of the value chain, and examine how competition, or, resource substitutability, affects a firm's ability to influence the corporate sustainability behaviors of other network members. FIGURE 1.6 represents both vertical and horizontal relationships in the value chain.

FIGURE 1.6
Relative Resource Value and Substitutability in the value chain



The resource based view of the firm (RBV) defines a firm as a bundle of resources, and explains the heterogeneity among them as a result of the differences in the kinds of resources contained in each specific bundle (Penrose, 1959; Peteraf, 1993). Moreover, resources serve as a source of competitive advantage for a firm as long as they are valuable, rare, difficult to duplicate, and non-substitutable (Barney, 1991).

While relative resource value refers to Barney's (1991) value attribute, the idea of resource substitutability relates to the remaining three resource characteristics present in RBV. The idea here is that while the relative value of a resource may remain stable, its potential to increase the dominance of the firm that controls it is moderated by how rare, inimitable and non-substitutable those resources are. Consider for example the value of

water to the survival of a human being, it is undoubtedly, together with oxygen and a few nutrients, one of the most valuable resources that exist toward that end. Now, consider the influence, or the power, someone with access to a well would have over the behavior of a thirsty man walking in the middle of the Sahara Desert. Then, imagine how that power relationship would change if these two people were set instead in downtown New York in similar circumstances. The value of the resource did not change since the man still needs water to survive. The change occurred in the ability that the owner of the well had to derive the power to influence the thirsty man. In the new context, the thirsty man can have access to water (or any other drinkable substance) from a virtually unlimited number of alternative sources. Therefore, by increasing the substitutability of the same valuable resource, its ability to generate the power to influence the behavior of a second party has gone from absolute to insignificant.

The same occurs in relation to interfirm relationships within a supply network. A firm's ability to influence the behavior of others does not solely depend on the need or the value others place on its resources, but also on how unique that firm's offering is. In other words, the higher the competition within a given stage of the value chain, the more substitutable a firm's resources are, and the lower the firm's ability to influence other members of its supply network becomes. Thus, proposition eight states:

Proposition 8: Resource substitutability weakens the effect of the firm's relative resource value on network dominance.

1.5.4. The Firm's Relative Position in the Network

A firm's resources are often assumed to be restricted to its internal set of assets, capabilities, etc. This is especially true from an RBV perspective, since it defines the firm

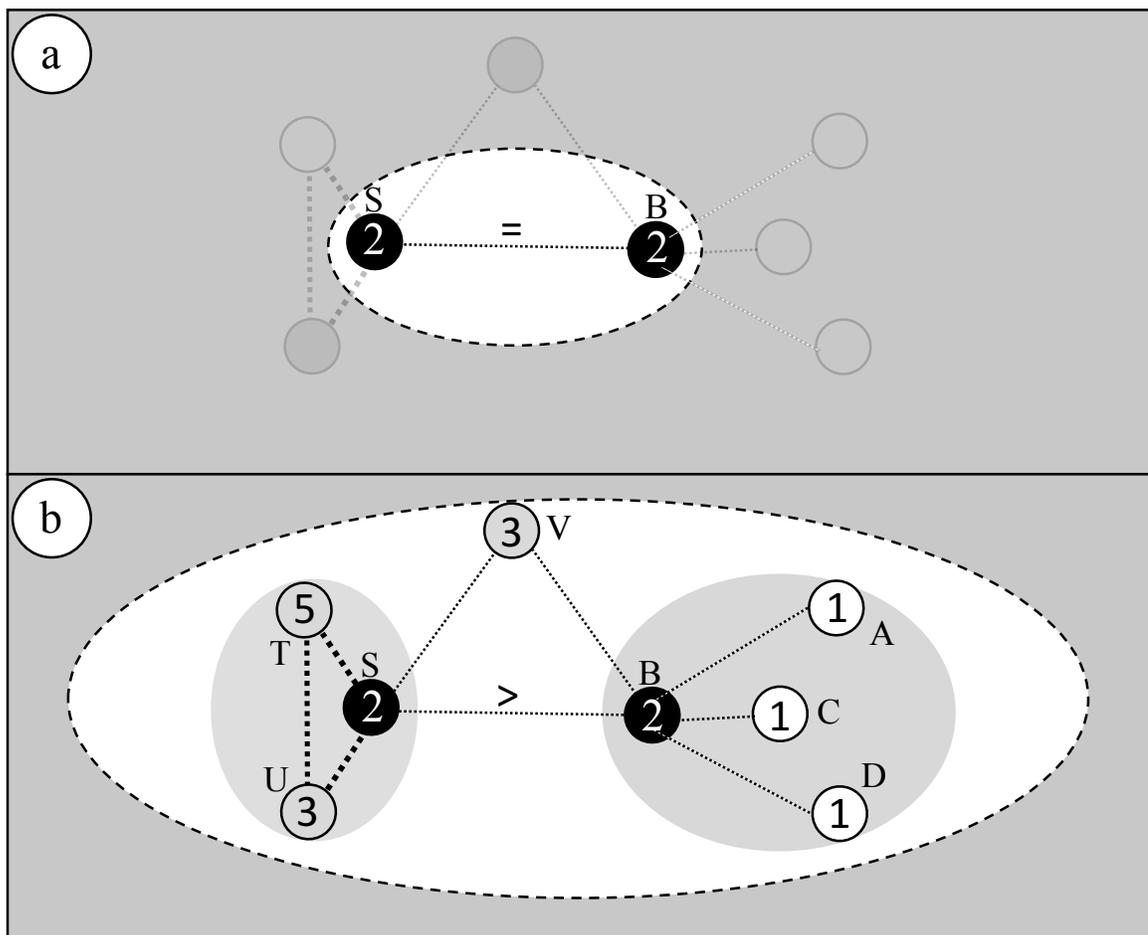
in terms of its resources. In reality, however, a firm's resources are not necessarily only those owned by the firm, or those over which it exerts complete control, but, the scope of a firm's resources can also be extended to the resources of other firms to which it has access through its network of relationships (McEvily and Marcus, 2005; Gnyawali and Madhavan, 2001; Gulati, 1999).

A network can be broadly described as a system of nodes, connected to one another by ties (Scott and Davis, 2007). In this study, supply networks refer to such a system, where the nodes represent firms, and the ties represent the interfirm relationships that exist among them. The firms present in such a network may have one or more roles, such as buyer, supplier, competitor, etc., depending on where these firms fit in the overall value chain system, and to which other firms they are connected. Recent works have drawn on network literature to emphasize the effects that the characteristics of the overall network have on the outcomes of individual organizations (Zaheer, Gözübüyük, and Milanov, 2010; Gulati, Nohria, and Zaheer, 2000). According to Zaheer and Bell (2005), from the network position level, one can observe the firm's place and consequent role within the network (e.g., peripheral versus central). Therefore, whether the effects are positive or negative, a firm's role within its overall network will largely be determined by its position in relation to the network's other members (Miemczyk, Johnsen, and Macquet, 2012; Zaheer and Bell, 2005; Zaheer et al., 2010).

Extant literature on networks argues that a firm's original pool of resources is in fact extended and reconfigured, based on the structure of its network, and the firm's location within it. This is due to the fact that in a network context, a firm's pool of resources must also take into consideration the access it has to the resource endowments of the other

parties to which it is connected, the extent of which is determined by how these connections are structured (Gulati and Gargiulo, 1999; Stuart, 1998). Hence, understanding where and how the firm fits within its network must be considered a matter of fundamental strategic importance (Gulati *et al.*, 2000). Only once a firm's internal and external (network) resources are taken into consideration can its total resource endowment be accurately assessed (Zaheer and Bell 2005).

FIGURE 1.7
Relative network position, relative resource value and network dominance



Our main argument here is that one cannot determine a firm's network dominance, or its capacity to diffuse corporate sustainability in the network by influencing the

behaviors of other network members, unless its relative resource value and substitutability are assessed from network perspective. FIGURE 1.7 illustrates the difference in assessing the network dominance of two firms, S and B, first by considering how they relate to each other in isolation (FIGURE 1.7a), and second, when this assessment is done in a network context (FIGURE 1.7b). Firms are represented by circles, while the dotted lines indicate their relationships to one another. To simplify the point we wish to make, we assume that the value of each firm's resources (indicated by the numeric value within each circle) to be absolute, rather than relative to each specific firm. That means that the resources of firm S are valued at two not only by firm B, but by all other members of the network.

In FIGURE 1.7a, both firms are equally dependent on one another, since the value of the resources of both firms is equal to two. This symmetric distribution of resource value implies that these two firms are interdependent. FIGURE 1.7b shows the same relationship, but instead of considering the two firms in isolation, it includes the resources of the other firms in the network and the ways in which they are connected to one another. In this new scenario, besides the original connection between firm S and firm B, The diagram shows that firm S is also connected to firms T, U, and V, and firm B is connected to firms A, C, D, and V. In a similar comparison between the values of firm S's total resource pool (internal + network resources) and that of firm B, we readily observe that, the value of the resources that are directly, and exclusively available to firm S is twice that of firm B, since $S(2) + T(5) + U(3) = 10$, and $B(2) + A(1) + C(1) + D(1) = 5$.⁴ Thus, what originally appeared

⁴Notice that the value of firm V's resources was excluded because both firm S and firm B have direct access to them.

to be a case of interdependence, has been reconfigured into a case with a highly asymmetric distribution of relative resource value, implying that firm S is dominant over B.

Although the network presented in FIGURE 1.7b is rather simple, this analysis could yet consider a number of other measures in order to increase the accuracy of how the firm's relative network position moderates the effects of its relative resource value on its network dominance, by reconfiguring the original (internal) resource pools of each firm in the network. For example, FIGURE 1.7b shows lines of different widths to represent differences in the strength of the inter firm relationships in the network (Granovetter, 1973). These differences could signify that firms with stronger relationships may count on having better access to their counterparts' resources. Therefore, if the thickness of the dotted lines were to increase with the strength of the relationship, this would imply that, on the one hand, firm S is not only directly connected to very valuable members of the network, but it has access to a large portion of their total resource value. On the other hand, besides being less valuable, firm B's direct connections only allow it restricted access to their resources.

Given the variety of metrics that can be employed to evaluate a firm's relative network position, and the fact that multiple measures can be applied at once, positive and negative effects will interact, strengthening, weakening or cancelling the effects of one another. Hence, the mediator effect of firm position will depend on the net effect of these different factors.⁵

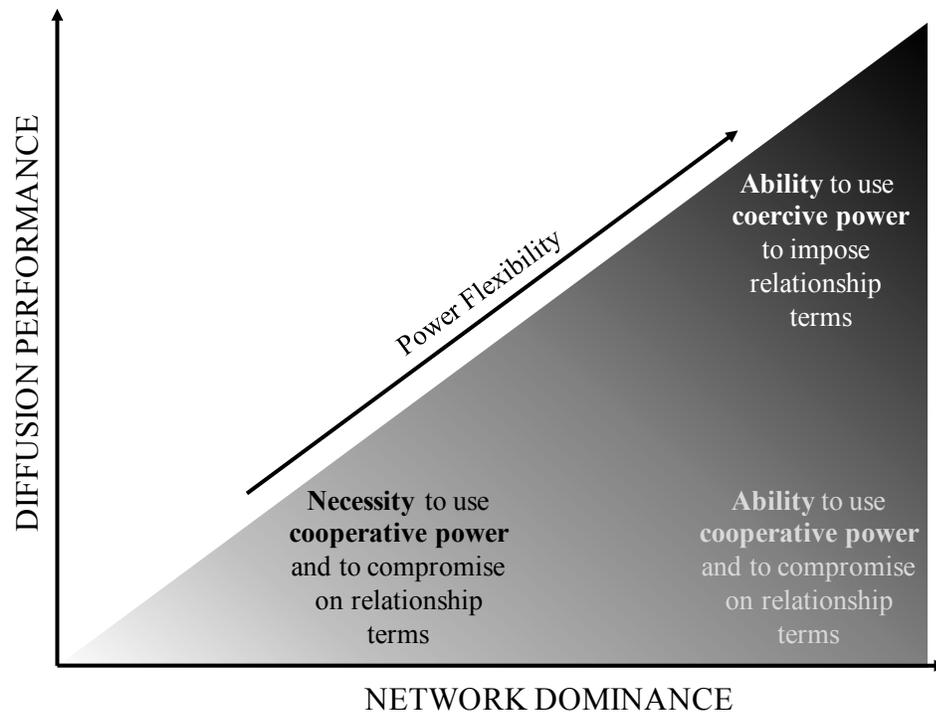
Proposition 9: The net result of the firm's network position is directly related to the effect of the firm's relative resource value on its network dominance.

⁵ A more in depth discussion of these different metrics merits at least one full study, and is beyond the scope of the present study.

1.5.5. Network Dominance and Corporate Sustainability Diffusion Performance

So far, we have established that a firm's network dominance is determined by its relative resource value, resource substitutability, and the its relative position within the network. Our discussion will now shift its focus to the firm's level of network dominance as determinant of its effectiveness as a corporate sustainability diffuser within its network.

FIGURE 1.8
Power flexibility and corporate sustainability diffusion performance



According to the arguments put forth in part one of the theoretical development, the higher the asymmetry in stakeholder exposure, the more focal firms are likely to be held responsible for the sustainability-related misconducts of other, non-focal members of its supply network. In other words, the more exposed a focal firm is in relation to the other members of the supply network, the higher the level of supplier sustainability risk it will

have to face. Hence, the more exposed a focal firm becomes, the greater its incentive to insure the diffusion of corporate sustainability within its network.

Conversely, literature has suggested that non-focal firms are not only shielded by the pressures of stakeholders, given their relative anonymity, but their resource pool is also smaller, making investments in semi-voluntary corporate sustainability initiatives relatively costlier to them than to focal firms (Hall, 2000). This leads to the conclusion that the goals of focal firms relative to the diffusion of corporate sustainability are incongruent with those of non-focal firms. While on the one hand focal firms are compelled to diffuse such initiatives, non-focal firms would prefer not to implement them.

We argue that focal firms with low levels of network dominance are restricted to the use of cooperative power and, thus, must compromise on the terms of its relationships, which, in turn, may keep it from achieving satisfactory levels of corporate sustainability diffusion (see FIGURE 1.8). However, as its network dominance increases, the firm's sole reliance on cooperative power diminishes, and its flexibility to employ coercive power increases. Therefore, whenever the compromises reached through cooperation do not yield terms that are acceptable to the dominant firm, it may employ its coercive power to ensure that its diffusion goals are reached. Hence, we propose that:

Proposition 10: The higher the firm's network dominance, the less bound it is to the use cooperative power, and the greater its flexibility to employ coercive power; hence, the more capable the firm is to ensure higher levels of corporate sustainability diffusion performance within its supply network.

1.6. Discussion

We now provide a view of the big picture, which the propositions put forth in this study attempted to create. First, we must refer back to the two questions that guided our

theoretical exploration: (1) What is the strategic relevance of corporate sustainability diffusion in global supply networks for focal and non-focal firms in the network? (2) What are the determining factors that explain a firm's capacity and performance in diffusing corporate sustainability within its supply network?

Part one sought to answer the first question by addressing two conceptual gaps that exist in the literature regarding the manifestation of supplier sustainability risk. The first of these gaps refers to the lack of conceptual link between the higher stakeholder exposure of focal firms, and the manifestation of supplier sustainability risk. Propositions one and two allowed us to establish performance inseparability, or, more specifically, negative performance inseparability as a mediator between stakeholder exposure and supplier sustainability risk that, when present, creates a necessary positive relationship between these two phenomena. That is, in the presence of negative performance inseparability, higher stakeholder exposure leads to higher supplier sustainability risk.

The second gap we addressed while answering question one had to do with how supplier sustainability risk manifests itself in relation to different types of corporate sustainability initiatives. To develop this discussion, we discussed the characteristics of mandatory and voluntary initiatives and proposed a hybrid third category initiatives we called semi-voluntary. In examining the characteristics of each of these categories, we arrived at propositions three, four, five, and six, which established that our proposed third category – semi-voluntary initiatives – as the ones involving the highest levels of supplier sustainability risk.

By reinforcing the cause and effect relationship between the higher stakeholder exposure of focal firms and higher levels of supplier sustainability risk, we further

established the strategic importance of the diffusion of corporate sustainability initiatives in global supply networks by focal firms, especially in regards to semi-voluntary initiatives.

In part two, we investigated the factors that determine how capable a firm is to diffuse corporate sustainability within its supply network, and how that capability is transformed into a higher diffusion performance. Here we shifted our discussion from the relationships among stakeholders and firms, to the inter-firm relationships that exist within supply networks. We propose that a firm's capacity to diffuse corporate sustainability initiatives in the supply chain depends on how dominant it is in relation to its network counterparts. Moreover, propositions seven, eight and nine state that relative resource value, resource substitutability, and the firms relative position in the network are responsible for the firm's network dominance.

Finally, we establish that the link between higher network dominance and actual high diffusion performance lies in the fact that, according to proposition ten, more dominant firms are flexible to use coercive power, whenever the results yielded by cooperative power are not considered satisfactory.

1.7. Conclusion

This study addresses the issue of corporate sustainability diffusion within global supply networks. As the triple bottom line perspective continues to permeate the global social fabric as the ethical and responsible way to measure firm performance, stakeholder pressures for firms to become more sustainable are bound to intensify, thus, bringing issues related to corporate sustainability to the forefront of strategic concerns. Moreover, as long as the value chain model continues to be characterized as networks of globally scattered

independent buyers and suppliers, it seems logical to expect that stakeholder pressures will continue to extend beyond the focal firms and encompass these entire supply networks.

1.7.1. Theoretical Contributions

Part one of our theoretical development addresses our question about the strategic relevance of corporate sustainability diffusion in global supply networks, particularly to focal firms. Therefore, the first theoretical contribution of this study is to add to the conceptual grounds that justify this importance that are currently available in the literature with the introduction of the concept of negative performance inseparability, as a full mediator between the stakeholder exposure asymmetries within a supply network, and the manifestation of supplier sustainability risk. We argue that, as it stands, the current definition of supplier sustainability risk does not establish a necessary cause and effect link between itself and asymmetric stakeholder exposure in the network. That is, if stakeholders are able to distinguish among the corporate sustainability performance of the multiple firms present in the network, focal firms would not have to be concerned about supplier sustainability risk, since the culprit of any misconduct would be readily identifiable and held responsible for its practices.

Our second theoretical contribution lies in the expansion of the dichotomous categorization of corporate sustainability initiatives into mandatory (compliance), or voluntary (pro-active). The realization that a third category was needed, and indeed existed, came as we sought to answer why certain firms voluntarily adopt corporate sustainability initiatives, which seem to conflict with their overall strategy. That is, why do these firms adopt initiatives, which in the absence of regulation, they would likely reject? This new category of corporate sustainability initiatives, which we termed semi-voluntary, shares

many of the properties of mandatory initiatives. However, among other peculiarities, differences between their respective stakeholder constituencies concerning power and access to information imply that although they do not qualify as mandatory, given the presence of negative performance inseparability and, consequently, of supplier sustainability risk, their adoption cannot be considered completely voluntary, either. Hence, we establish that the only initiative category that requires diffusion is the semi-voluntary.

Part two addresses the question of how focal firms are able to influence unwilling parties in their supply networks to participate in the adoption and diffusion of corporate sustainability initiatives. Here we make our third theoretical contribution by proposing a theoretical framework which identifies the network-related firm characteristics that serve as the antecedents of network dominance (relative resource value, resource substitutability, and relative network position), or, the firm's capacity to diffuse corporate sustainability initiatives throughout its supply chain. To define the properties of the constructs in this framework, we borrowed from resource dependence theory, the resource based view of the firm, and network analysis, which, by complementing one another, enabled us to provide a more concrete and precise explanation of these phenomena than would have been possible through a single perspective (Carter and Easton, 2011; Connelly et al., 2013; Mayer and Sparrowe, 2013).

Our fourth and final contribution comes establishing a conceptual link between a firm's network dominance and its likely corporate diffusion performance, through the use of different types of power (French and Raven, 1959). Here we propose that less dominant firms will be restricted to the use of cooperative power, a category that, to use French and

Raven's (1959) power taxonomy, includes both referent and expert powers. Cooperative power implies in negotiations and the establishment of mutually beneficial and agreed upon compromises. Since we saw that the objectives of focal vs. non-focal firms concerning corporate sustainability are likely to diverge, the focal firm's efforts to establish relationship terms favorable to the implementation of certain corporate sustainability initiatives will likely be compromised by its necessity to act cooperatively with its counterparts. However, as the firm becomes more dominant within its network, it gains an increasing ability to employ coercive power, which encompasses what French and Raven (1959) referred to as coercive and reward powers. This ability does not preclude the firm from acting cooperatively, but makes cooperative power optional rather than the only available option. Hence, a focal firm that is highly dominant becomes more flexible, collaborating whenever possible, but able to impose its own terms in cases where the outcomes of cooperation are not minimally satisfactory. Thus, we propose that by being more flexible in terms of power, more dominant firms are better able to ensure a higher corporate sustainability diffusion performance.

1.7.2. Managerial Applications

The growing relevance of corporate sustainability within global supply networks has significantly raised the level of responsibility of supply chain managers. This applies especially to the managers of focal firms due to supplier sustainability risk, or, the risk of being held responsible for the actions of other members of its network. The more direct involvement of these managers with the social and environmental performances not only of their own firms, but that of their respective supply networks (Carter and Easton, 2011; Miemczyk et al., 2012) has made their actions and decisions much more consequential to

the firm's overall performance and even survival. Therefore, we sought to develop our arguments and insights not only to serve as theoretical contributions, but as general guidelines for managerial planning and decision making concerning corporate sustainability diffusion, particularly with respect to the prioritization of initiatives to undertake, and the costs of diffusion.

One of the main challenges supply chain managers face in regards to corporate sustainability relates to the allocation of finite resources to address an increasing number of stakeholder demands. That is, managers must be able to prioritize among these demands in order to allocate its resources according to how consequential each of these demands is to the firm. This prioritization is especially relevant in cases where stakeholders do not expect a response at the firm level, but one at the network level. That is, it is important that managers are able to distinguish among corporate sustainability initiatives, those which imply supplier sustainability risk, and thus must be diffused in the network, from those that do not. We believe that the insights provided in part one of the theoretical development, especially that of proposition four, in which we arrive at the conclusion that supplier sustainability risk only applies to semi-voluntary initiatives, should help managers to distinguish between the initiatives it must implement at the firm level from those which must also be diffused throughout the network, and to prioritize accordingly.

Part two provides a discussion of how the focal firm may protect itself against supplier sustainability risk. Our discussion of implies that the focal firm's level of network dominance will be responsible for its likelihood of avoiding such risks, but that it also must bear the costs of overcoming the unwillingness of non-focal firms to engage in corporate sustainability activities the focal firm finds necessary. Therefore, the problem faced by

managers goes beyond adopting strategies to increase its relative resource value, diminish its resource substitutability and improving its position within its network, but it involves a number of other aspects involved in maximizing the effect of its dominance on diffusion performance, while minimizing costs. Monitoring the activities of other network members to remain informed and alert to potential corporate sustainability misconducts, often a way to exercise coercive power over the network, is a costly endeavor. Therefore, managers of focal firms must be engaged in finding opportunities to align their firm's corporate sustainability objectives with those of its non-focal counterparts. Finally, in doing this analysis, managers should consider whether this shift to a triple bottom line measure of performance and the resulting new constraints within which must operate (e.g. investments necessary to increase dominance in order to reduce supplier sustainability risk), have not made the transaction costs of outsourcing large enough to warrant the vertical reintegration of many value chains.

1.7.3. Limitations of the Study and Future Research Paths

Given its theoretical nature, one of our study's current limitations is its lack of empirical evidence and validation. Furthermore, as we move toward an empirical phase, we expect to encounter many difficulties involving the collection and mapping of globally dispersed networks. Some of our most evident methodological challenges are related to, for example, objectively measuring the relative resource values of firms within networks in order to compare the magnitude of their network dominance levels, which is a fundamental element in the corporate sustainability diffusion framework here presented. Nonetheless, in the age of big data, the emergence of increasingly comprehensive databases

are beginning to allow such obstacles to be overcome (Mayer-Schönberger and Cukier, 2013).

The arguments, propositions, and the theoretical framework presented in this paper, provide new paths for research on the strategic and international relevance of corporate sustainability in global supply networks. For example, given the global nature of supply networks, we propose an in-depth examination of how corporate sustainability diffusion takes place in different geographical areas. Cultural, institutional, and economic factors will likely affect the way firms and stakeholders perceive the costs and benefits involved in the adoption of corporate sustainability, thus setting varying levels of priority to the diffusion of corporate sustainability, in both the short and the long runs. Along these same lines, inter-industry definitions and requirements will also shape perceptions and set priorities regarding the intensity with which different types of initiatives are adopted, making such comparative studies a rich topic in this field of inquiry. Yet another fertile topic for research in this area relates to how corporate sustainability diffusion relates to innovation strategies. This topic can address the different types of innovation in this area in relation to its industrial or cultural/geographic network contexts, as well as based on the specific needs and objectives of existing and emerging businesses, industries, and their stakeholders regard the adoption of incremental versus disruptive innovations aimed at creating more sustainable value chains.

CHAPTER 2.
THE DIFFUSION OF CORPORATE SUSTAINABILITY IN THE
GLOBAL AUTOMOTIVE SUPPLY NETWORK:
AN EMPIRICAL EXAMINATION

2.1. Introduction

The concept of social and environmental sustainability was introduced into the automobile sector propelled by stakeholder pressures, such as more stringent regulations and consumer demand. As the focal firms of this sector, auto manufacturers started these changes in the environmental, health, and safety (EHS) areas within their own manufacturing facilities. However, most of this sector's negative externalities are caused by the operation of these motor vehicles. On the one hand, environmental concerns include the consumption of nonrenewable resources, the emission of CO₂ and other noxious substances, vehicular noise, city air pollution, and the disruption of natural habitats by the construction of new roads. On the other hand, social concerns refer to road safety, the economic viability of public transportation, the creation of transport-disadvantaged social groups, community disruption, traffic and road congestion, the depletion of community space, and the financing of highway systems.

Auto manufacturers began to engage in environmental initiatives in the early 1990s through the introduction of new technologies to limit emissions, increase fuel efficiency, and improve propulsion systems. Concomitantly, social concerns started to be addressed with the production of safer automobiles through innovations like airbags and antilock brakes. In the late 1990s and early 2000s, the industry was once again being reshaped, as auto manufacturers were promoting a strategic vision based on modularity and outsourcing. From a largely vertically integrated model, the industry became a vertically unbundled

structure. In the mid-2000s, the modularity aspect of that vision was dropped so that the auto manufacturers could avoid having their dominant position undermined by increasingly powerful suppliers. Nevertheless, outsourcing practices are still an integral part of how the sector operates (Jacobides et al., 2015).

Since its introduction in the automotive sector, the importance of corporate sustainability (CS) has notably increased, following an intensification of stakeholder pressures for firms to address, manage, and reduce the social and environmental costs of their activities or be held accountable for them (Wolf, 2013). The magnitude of such pressures is being felt by Volkswagen (VW) in its enduring crisis over the use of hidden software in diesel engine cars with the intent of deceiving American regulators by indicating lower than actual emissions of toxic substances into the atmosphere. Along with forcing the resignation of its CEO and potential fines estimated at \$18 billion dollars, this violation deeply damaged the company's reputation, and VW provisioned another \$7.3 billion to address potential class action lawsuits from affected customers (*The Economist*, Sept 26, 2015)

In a large number of other cases, however, firms from practically every industry have begun to incorporate initiatives to address stakeholder concerns over corporate sustainability into their strategies (Carter and Rogers, 2008; Jayaraman, Klassen, and Linton, 2007; Krause et al., 2009; McIntyre, 2007; Seuring and Müller, 2008; Skjøtt-Larsen, Schary, Mikkola, and Kotzab, 2007; Andersen and Skjøtt-Larsen, 2009). Nonetheless, the upsurge of global supply networks over the last few decades, resulting from the wide adoption of global outsourcing practices by firms seeking to remain competitive in the more competitive and globalized business environment, has led to a shift

in stakeholder focus from the individual firm to its supply network. The realization was that in a context where global supply networks have become practically ubiquitous (Kotabe and Mudambi, 2009; Mudambi and Venzin, 2010), corporate sustainability cannot be constrained to the corporate boundaries of an individual firm, but encompasses the entire value chain of its products (Krause et al., 2009; Miemczyk et al., 2012). This shift in stakeholder focus has raised the level of popularity and relevance of sustainable supply chain management (SSCM) among practitioners, academics, and the media (Seuring and Müller 2008; Andersen and Skjøtt-Larsen, 2009; Carter and Easton, 2011; Ashby et al., 2012; Miemczyk et al., 2012; Seuring 2013; Winter and Knemeyer, 2013).

Despite significant developments in the area of SSCM, much discussion is still needed on the topics of who is responsible for corporate sustainability at the network level, and of why and how corporate sustainability gets diffused throughout supply networks. Who is responsible for ensuring that all network members meet the necessary corporate sustainability standards in order to adequately fulfill the demands of stakeholders? Why do some firms engage in corporate sustainability and others do not? And what contributes to the effective diffusion of corporate sustainability in a supply network? What are the likely implications of these new corporate sustainability constraints to the structure of the automotive supply network as a whole? Moreover, there is a persisting dearth of large-scale empirical studies in this area, which we attribute to difficulties in identifying and collecting reliable data relating large global supply networks and corporate sustainability performance. This paper seeks to contribute to the literatures in strategic management, international business, and SSCM by discussing and addressing these questions.

The concept of supplier sustainability risk describes a problem that is a direct result of the expectations of external stakeholders from businesses in general. It refers to the potential damage to a focal firm's corporate sustainability reputation caused by the misconduct of other members of its network (Hajmohammad and Vachon, 2016). Hence, focal firms must now be concerned not only with their internal corporate sustainability, but also with those that lie beyond their corporate borders to ensure that its entire supply network abides by the same sustainability principles. Extant literature suggests that the level of supplier sustainability risk faced by a firm will depend on how exposed that firm is to the scrutiny of stakeholders.

After establishing that focal firms (the who), such as car manufacturers, face a logical imperative to diffuse corporate sustainability in their supply networks due to a combination of supplier sustainability risk, stakeholder exposure and negative performance inseparability (the why), we propose a conceptual framework to explain the factors that determine a firm's capacity to diffuse corporate sustainability initiatives in its network, or, the firm's network resource dominance (the how). Our framework draws from resource dependence theory, the resource-based view of the firm, and network theory to define three different constructs, relative resource value, resource substitutability, and relative network position, which we propose to be the antecedents of a firm's network dominance. From this framework, we develop a set of hypotheses, which are tested on a sample of 10,728 firms in the automotive sector, linked by 45,044 inter-firm relationships. Our test results show significant support for our hypotheses.

This study's strategic approach and international character make it relevant to scholars and managers in the fields of strategic management and international business, as

well as to those interested in the emergence of sustainable supply chains. It also provides managers in the automotive industry an interesting discussion of how this emerging business paradigm, where corporate sustainability is the norm and no longer the exception, may potentially cause significant changes on how value chains are structured within this sector.

2.2. Theoretical Background

Over the last few decades, two major trends have greatly contributed to the current state of our business environment, and are likely to continue to do so in the foreseeable future. The first refers to the upsurge of global supply networks resulting from the wide adoption of global outsourcing practices by firms seeking to remain competitive in the more competitive and globalized business environment (Hult, 2004; Kotabe and Mudambi, 2009; Mudambi and Venzin, 2010; Connelly et al., 2013). The second trend relates to the rise to prominence of sustainability issues, which resulted mostly from concerns over the negative impacts caused by industrial activities on the environment and on society in general. The threats to the well-being of our current generation, and the prospects of leaving a somber legacy to future ones, has led a number of stakeholders to demand higher accountability for firms that act in detriment of society and the environment (Wolf, 2013). According to Freeman (2002, p. 41), stakeholders are *“any group or individual that can affect or is affected by the achievements of the organization’s objectives.”*

As both of these trends gained strength, the inherent connection between supply chain management and corporate sustainability has become more apparent, strengthening the argument that focal firms could be less vulnerable by expanding their sustainability

strategies into their supply networks (Peters, Hofstetter, and Hoffmann, 2011; Winter and Knemeyer, 2012).

For the purposes of this study, we define corporate sustainability in terms that correspond to the concept of the triple bottom line (TBL), as conceived of by Elkington (1998). This concept moves away from a purely economic view of a firm's purpose to one that takes into consideration its environmental and social impacts. Hence, corporate sustainability is defined by a firm's actions, behaviors, and initiatives that consider economic, social, and environmental performances as inextricably connected to one another (Carter and Rogers, 2008). This broad definition implies that the types of corporate sustainability initiatives will vary according to the needs of each type of economic activity, possibly taking the form of lower energy consumption, adequate working conditions, the implementation of socially and environmentally sound governance systems, etc. (Bansal and Roth, 2000). In the automotive industry, this concept is often translated into improvements in safety, fuel efficiency, decreasing emissions of greenhouse gases and other toxic substances, etc. (ibisworld.com, 2016).

The emergence of pervasive global supply networks and the disaggregation of value chains imply that the total value of a product is no longer the result of an individual, vertically integrated organization, but that of a network of organizations, each being responsible for a share of that value. The sharing of such activities means that stakeholders can no longer evaluate corporate sustainability performance by examining individual focal firms, but, must direct their attention to the performance of their entire supply networks (Hajmohammad and Vachon, 2016). The auto industry, similarly to a number of other industrial sectors, has followed the path of vertical disintegration. Until well into the 1990s,

the Big Three (General Motors, Ford, and Chrysler) and Toyota (today's largest auto manufacturer) controlled one-third to two-thirds of the production of all the components that went into their cars (Mudambi, 2008; Jacobides et al., 2015). However, in the late 1990s and early 2000s, auto manufacturers began to outsource much of the production of their components, leading to a reconfiguration of the entire industry (Jacobides et al., 2015).

As the scope of corporate sustainability performance shifted from the focal firm level to that of its supply network, certain stakeholders began to regard focal firms as collectively responsible for the network's overall corporate sustainability performance. In practice, this means that focal firms may be held accountable for the corporate sustainability's misconduct of other, independent members of the network, over which the focal firm has no direct control. Extant literature refers to this liability, which threatens the reputation of focal firms in regards to corporate sustainability, as supplier sustainability risk (Hajmohammad and Vachon, 2016).

Although stakeholder pressures have been largely responsible for the observed intensification of the corporate sustainability efforts made by firms (Fortanier, Kolk, and Pinkse, 2011; Gallo and Jones-Christensen, 2011), research suggests that not all firms are uniformly affected by these pressures (Hall 2000). Focal firms, characterized by having their prominent role in the dynamics of their supply networks (Gereffi, 1999; Lambert and Cooper, 2000; Chen and Paulraj, 2004) tend to face higher levels of exposure to stakeholder scrutiny.

2.2.1. Stakeholder Exposure and Supplier Sustainability Risk

Extant literature has focused on explaining higher levels of corporate sustainability reporting as the result of external factors responsible for increasing firms' exposure to stakeholders. The main factors studied have been: (1) corporate visibility; (2) sector affiliation; (3) country-of-origin; and (4) legal requirements. Traditionally, corporate visibility has been measured in terms of branding issues, such as brand/company recognition, such as in cases where the company's name and the brand's name are the same (Haddock, 2005), media exposure, which usually refers to how much press coverage the company receives, and supply/value chain position, as in cases where the firm is closely linked to its final consumer (Hall, 2000; Groves et al., 2011). Sector affiliation is the most commonly mentioned source of exposure since companies belonging to industries with high social and environmental costs are more likely to be scrutinized by stakeholders. In a similar vein, social and cultural norms will shape the way corporate sustainability is perceived. Countries where society is more aware of, and more empowered to deal with, social and environmental issues are likely to see higher rates of corporate sustainability activities being reported by companies, just as in countries and industries where the legal corporate sustainability requirements are more stringent (Fortanier et al., 2011; Gallo and Jones-Christensen, 2011; Hahn and Kühnen, 2013).

Corporate size, although not an external factor, closely relates to corporate visibility and, as such, also serves as a source of stakeholder exposure, as larger firms are usually connected to a larger set of stakeholders and, thus, are likely exposed to a higher number and variety of corporate sustainability demands (Fortanier et al., 2011; Gallo and Jones-Christensen, 2011; Hahn and Kühnen, 2013).

The automotive sector is a highly regulated sector with a history of, and potential for, causing enormous social and environmental problems—especially in regard to air pollution and overall safety—makes it the center of attention for a number of stakeholders. Besides, as the industry's focal firms, car manufacturers are large corporations with highly recognizable brands, wide media coverage, and located close to their final consumers. Together, these characteristics make them the most visible firms of a very scrutinized sector, which results in very high levels of stakeholder exposure.

Hajmohammad and Vachon (2016) propose that supplier sustainability risk stems from a combination of three distinct risk events: (1) the occurrence of sustainability-related supplier misconduct; (2) the detection of misconduct by concerned stakeholders; and (3) stakeholders deciding to broadly communicate the initial occurrence.

In the automotive industry, although the development and launch of final products is the result of intense interactions between automakers and their first-tier suppliers, the credit (or the blame) for (un)successful products is virtually always attributed to the automaker. Automakers bear full legal responsibility for the vehicles sold and are liable for any technical or component failures that relate to a crash, independent of whether the failed component was manufactured in-house or acquired from an external supplier (Jacobides et al., 2015). Thus, the market perception of an automaker's quality and performance is inseparable from those of its suppliers.

2.2.2. Corporate Sustainability Diffusion

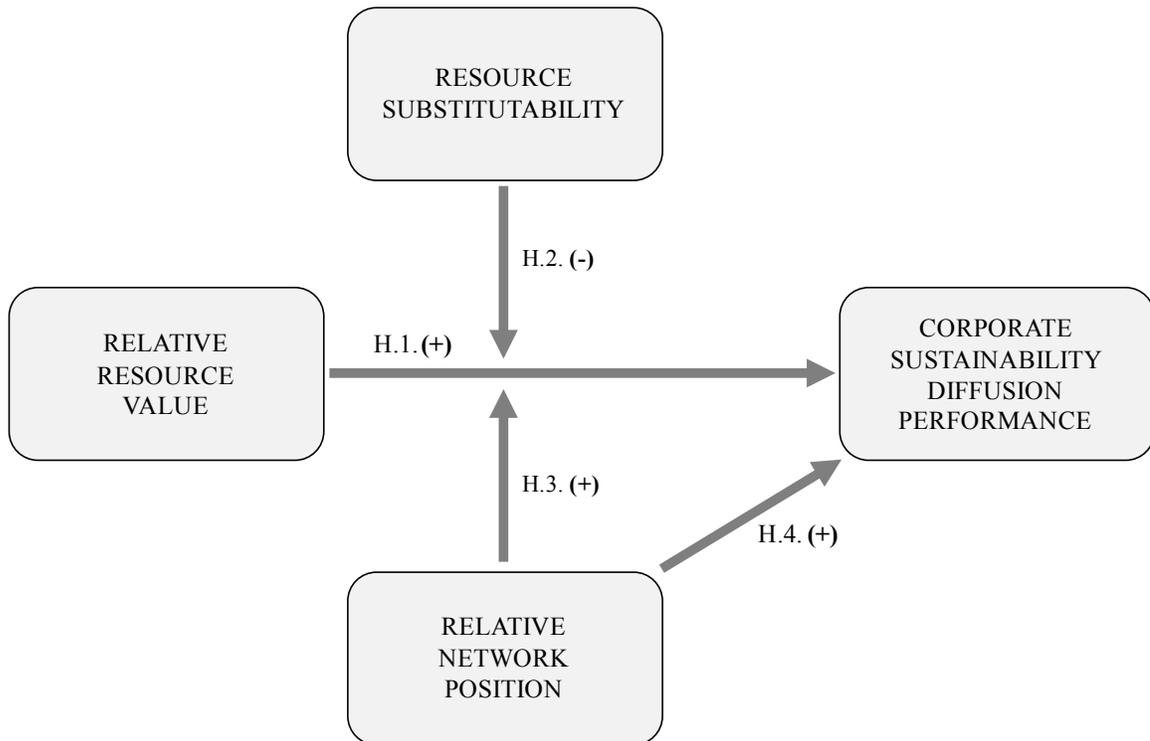
The terms diffusion or propagation in the study of networks refer to the spread of “something”, from the members that possess it, to those that do not. Common examples can be observed when a certain video goes “viral” on social media or by the spread of an

actual virus, such as the H1N1, in a population. The phenomenon first manifests itself in one, or a just a few members of a network, and then it spreads according to how those members are connected and/or exposed to one another.

2.3. Hypotheses Development

In this study, we propose a theoretical framework (see FIGURE 2.1) to explain how certain network-related firm characteristics enable focal firms to diffuse corporate sustainability initiatives in order to avoid the potential negative consequences of being held responsible for the misconduct of other network members. More specifically, we examine how this process takes place in the automotive sector by developing and empirically testing a set of hypotheses derived from our framework on a large network sample of the automobile sector.

FIGURE 2.1
Network-related firm characteristics and corporate sustainability diffusion



So far, literature has established that, as the industry’s focal firms, auto manufacturers are the most interested parties in ensuring the diffusion of the corporate sustainability initiatives, which stakeholders view as necessary. However, the fact that the network possesses multiple relationship tiers implies that to permeate the entire network, other firms will also act as corporate sustainability diffusers. That is, once the focal firm has diffused its initiatives to its first tier buyers and suppliers, it can only continue that process indirectly, since now the focal firm must employ those first tier suppliers to influence the second tier suppliers, and so on. Hence, although we expect auto manufacturers to be the main sources of diffusion, the network-related firm characteristics about which we hypothesize are more or less present in every firm, thus, enhancing or detracting from the each firm’s capacity to diffuse corporate sustainability in the network.

1.1.1. Relative Resource Value and Corporate Sustainability Diffusion

Resource dependence theory (RDT) proposes that a firm's survival depends upon its ability to procure from the external environment the resources that are essential to its survival (Pfeffer and Salancik, 1978). The behavior of a firm is, therefore, determined by: (1) its context in terms of resources—which are defined as anything deemed as valuable to the organization—and (2) its dependence on other organizations in attaining those resources (Emerson, 1962; Pfeffer and Salancik, 1978). As such, the concept of dependence serves to establish a power structure within inter-firm relationships where different firms control access to the resources sought by one-another (Ulrich and Barney, 1984). Hence, one of the RDT's central themes is the development of strategies in which firms are able to reduce their level of resource dependence by increasing their control over valuable resources (Hillman, Withers, and Collins, 2009). It has also been argued that resource dependence is a key factor in questions of supplier development (Carr, Kaynak, Hartley, and Ross, 2008), a point that directly applies to our discussion about the diffusion of corporate sustainability in global supply networks.

Based on RDT, firms that control more valuable resources relative to its counterparts, have a certain measure of power over them. However, we must highlight the term relative, as value is the “eye of the beholder”. That is to say that, in a supply network, the resources of a firm only have value, if another firm finds it valuable. This means that the value of a specific resource to a firm is always relative to how dependent the firm is on it.

implying that they are independent from one another. In such cases, the two firms are unlikely to form a relationship, and since our topic revolves around networks of inter-firm relationships, this quadrant falls outside the scope of our discussion.

Given the symmetric distribution of relative resource value in quadrant one, firms must negotiate a compromise regarding the terms of the relationship, thus, neither firm is able to impose its corporate sustainability strategy upon the other. As the distribution of relative resource value becomes more asymmetric, as in quadrants two and four, one of the firms becomes dominant and the other dependent. The latter two scenarios constitute better reflections of relationships involving focal and non-focal firms within a supply network. In such cases, the more dominant the firm, the better equipped it is to ensure a high level of corporate sustainability diffusion performance.

The effects of resource dependence on the automotive sector's buyer-supplier relationships were clearly demonstrated when, in the late 1990s, auto manufacturers, being by far the most dominant firms in the automotive sector, were able to shift the entire industry toward a new strategic vision, which was initially based on the deverticalization of the sector through outsourcing and modularity. Soon, however, these focal firms began to realize that through consolidation maneuvers in the supplier base, some crucial resources they once controlled were now being controlled by large suppliers of modules. Consequently, the power structure of the sector began to shift, weakening the position of the auto manufacturers, and leading to the emergence of increasingly powerful suppliers. This shift meant that car manufacturers, which were once accustomed to dictate the rules of the industry, had now to begin making compromises with some of these larger players

in their supply base in order to gain access to resources of which they were dependent. (Jacobides et al., 2015).

Our argument here is the more resource dominant a firm is, the higher will be its influence on the behavior of its counterparts, since by avoiding the need for compromises where concessions must be made by both sides, the firm is able to set the rules of its relationships with suppliers by imposing the behaviors it deems appropriate. Therefore, Hypothesis 1 reads:

Hypothesis 1. The higher the relative value of a firm's resources to its network, the higher will be its corporate sustainability diffusion performance.

2.3.1. Resource Substitutability and Corporate Sustainability Diffusion

According to the resource-based view of the firm, a firm is defined by the collection of resources it controls. Therefore, resource heterogeneity is the main differentiating factor among firms (Penrose, 1959; Barney, 1991; Miller and Shamsie, 1996). Barney's framework (Barney, 1991; Barney, Wright, and Ketchen, 2001) proposes that a firm's ability to derive competitive advantages from its resources, depends on how valuable, rare, inimitable, and non-substitutable those resources are.

In the previous section, we dealt with vertical buyer-supplier relationships, where firms occupy different stages of the value chain and derive the capacity to influence the behavior of other firms towards sustainability from the value other firms place on the resources it controls, or, from how dependent other firms are upon its resources. In this section we discuss the implications of competition, or how a firm's capacity to diffuse corporate sustainability is influenced by the presence of other players within the same stage

of the value chain. We refer to the presence of these horizontal relationships as resource substitutability, since it refers to the possibility that firm resources vary in how rare, inimitable, and non-substitutable they are. Thus, we argue that although the relative value of a resource may remain stable, the ability those resources have to generate competitive advantages will vary according to the number of alternatives its vertical counterparts have available.

To illustrate this argument, let us consider the internal combustion engine, and the fact that it is a fundamental component (or module) to the production of an automobile, which until very recently had no real substitutes. Let us then suppose a scenario where car manufacturers have a number of similar, or, equivalent alternatives in terms of suppliers of internal combustion engines. Although the engine remains a resource of absolute value to the auto manufacturer – since without a motor there is no car – the fact that the car manufacturer can acquire it from more than one supplier reduces the ability each of those suppliers have to derive power from that valuable resource⁶.

A more concrete example can be observed when, from late 1997 to 2007, auto manufacturers had to work to reverse the modularization component of their vision for the automotive sector (Jacobides et al., 2015). This change was brought about not only as the result of the auto manufacturers' loss of control over key resources, but also because the shift toward modularization led to the consolidation of smaller suppliers into fewer, larger, and more specialized. In other words, modularization contributed to lower the resource

⁶ It is worth noting that the introduction of disruptive innovations would not only increase resource substitutability, but would also affect the resources relative value. Clues of such a change in the automotive industry can be seen with the introduction of high performance, fully electric motors, such as the ones produced by Tesla motors.

substitutability of those suppliers, causing an increase of their bargaining power before the auto manufacturers. From these arguments our second hypothesis reads:

Hypothesis 2. A firm's resource substitutability will negatively moderate the effects of its relative resource value on its corporate sustainability diffusion performance.

2.3.2. Relative Network Position and Corporate Sustainability Diffusion

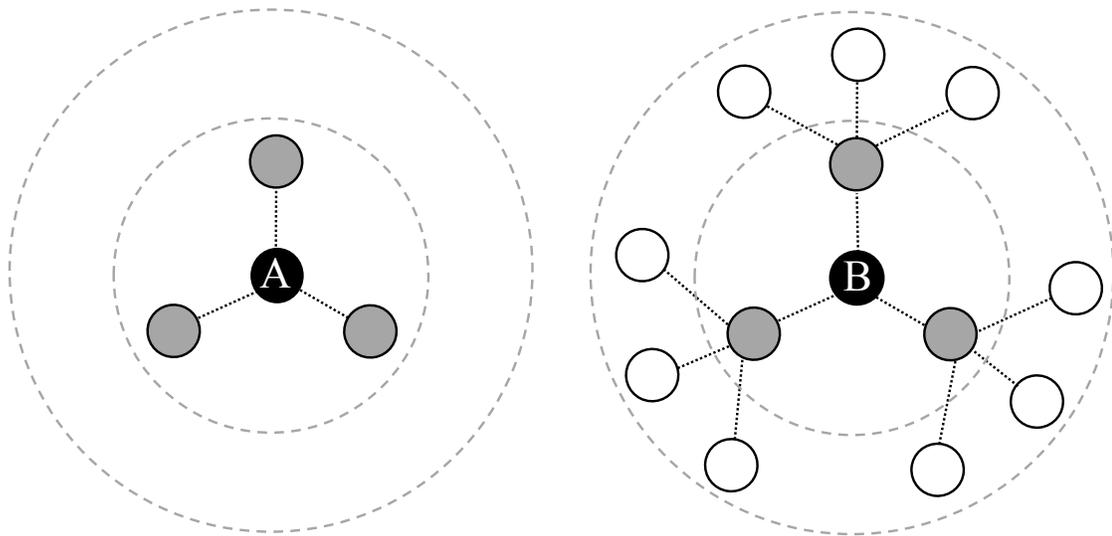
A network is generally defined as a system of nodes connected by edges, which in this study are represented by the firms in the automotive sector and the inter-firm relationships among them, respectively. Researchers have called attention to the fact that the position of a firm in relation to the other members of its network will determine to a large extent the its role within that network (Gulati et al., 2000; Miemczyk et al., 2012; Zaheer and Bell, 2005; Zaheer et al., 2010). From a network perspective, it is possible to go beyond the simple assessment of the firm's role as a buyer, supplier, and its place in the value chain. It is possible to understand how the firm "fits" among all its upstream and downstream partners, competitors, and potential new and alternative partners. At the network level, therefore, we abandon the assumption that the firm's relative resource power is restricted to its internal resources, or those over which it exerts complete control, and assume that the firm's original pool of resources can be extended and reconfigured by including its access to the resources endowments of other firms with which it has established its network relationships (Gnyawali and Madhavan, 2001; Gulati, 1999; Gulati and Gargiulo, 1999; McEvily and Marcus, 2005; Stuart, 1998). Given the network's contextual implications to the firm's actual resource endowment (Zaheer and Bell 2005),

the firm's relative network position becomes fundamentally important for the development of a corporate sustainability strategy (Gulati et al., 2000).

For example, by the mid-2000s, as the auto manufacturers began to realize the strategic miscalculations in their vision. It was their central roles in the network with respect to system integration, as well as in terms of differentiability creation, that ultimately enabled them to halt the modularity aspect of the process they had originally started. Thus, allowing them to remain the most influential members of their network (Jacobides et al., 2015)

In the context of supply networks, the measure that best reflects the firm's how a firm's relative network position affects its ability to diffuse corporate sustainability is centrality. The most common measure of centrality is given by the firm's degree, or, the number of firms to which it is connected. In those terms, the higher the firm's degree, the more central to the network it is. Although degree centrality provides a good idea of the firm's influence in the network, it fails to account for the multiple layers, or, tiers of the supply network. Therefore, we propose to measure centrality by using eigenvalue centrality, which not only takes into consideration the number of direct connections the firm has, but also the number of direct connections its connections have, and so on.

FIGURE 2.3
Degree versus eigenvector centrality



Let us consider firms A and B, within their respective networks, as depicted in FIGURE 2.3. Their measure of degree centrality would suggest that both firms are equally central, since they both have three direct connections. That obviously underestimates firm B's diffusion capacity, since it does not take into consideration the fact that its connections are also well connected, which makes its network much larger than that of firm A. Therefore, since eigenvector centrality considers not only the firm's direct connections, but also those of its entire network, we have used it as our measure of relative firm position in the network. This leads us to hypothesis 3:

Hypothesis 3. A firm's relative network position will positively moderate the effects of its relative resource value on its corporate sustainability diffusion performance.

Not only does the firm's net relative position positively moderate the effects of the firm's relative resource value onto its corporate sustainability diffusion capacity by potentially adding value to the firm's original pool of resources, but, its position may also exert a direct effect on diffusion. This happens due to the mere fact that this position is determined by how it associates with other members of the network. Hence, a firm with a higher number of relationships has, regardless of the relative value of its resources, access to a higher number of entities to which it can diffuse information. Therefore, using centrality once again as our measurement unit, we put forth hypothesis 4:

Hypothesis 4. A firm's relative network position is directly related to its corporate sustainability diffusion performance.

2.4. Data and Methodology

Our sample consists of the joint supply networks of the largest and most significant car manufacturers in the world (see Table 2.1), comprising approximately 80 percent of the automotive industry's market share. These networks contain the first two upstream and downstream tiers for each of these auto manufacturers, adding up to a total of 10,726 firms, and 45,044 buyer-supplier relationships. For each of these firms and relationships, we collected a number of variables related to supply chains, sustainability, and firm performance, which were either directly employed in our regression models or used as the basis to calculate other constructs proposed in this study. Besides its size and representativeness in relation to the automotive industry, our sample is also representative of the global nature of these network structures. The auto manufacturers have their

headquarters located in nine countries: France (2), Germany (3), Great Britain (1), India (1), Japan (6), Russia (1), South Korea (2), Sweden (1), and the United States (3). The remaining companies in the sample represent a total of 95 different countries.

TABLE 2.1
Ranking of auto manufacturers by motor vehicle production (2014) *

	Company Name	Country of Domicile	Percentage of Total Vehicles Sold
1	Toyota Motor Corp	Japan	12%
2	Volkswagen AG	Germany	11%
3	General Motors Co	United States	11%
4/5	Hyundai Motor Co/Kia Motors Corp**	South Korea	9%
6	Ford Motor Co	United States	7%
7	Nissan Motor Co Ltd	Japan	6%
8	Fiat Chrysler Automobiles NV	Great Britain	5%
9	Honda Motor Co Ltd	Japan	5%
10	Suzuki Motors	Japan	3%
11	Peugeot SA	France	3%
12	Renault SA	France	3%
13	Bayerische Motoren Werke AG	Germany	2%
14	Daimler AG	Germany	2%
15	Mazda Motor Corp	Japan	1%
16	Mitsubishi Motors Corp	Japan	1%
17	Tata Motors Ltd	India	1%
18	Geely (Volvo AB)	China	1%
19	GAZ OAO	Russia	< 1%
20	Tesla Motors Inc	United States	< 1%

Source: Organisation Internationale des Constructeurs d'Automobiles (OICA)

* This ranking refers solely to the manufacturers included in this study.

** The data for these two manufacturers was only available in aggregate form.

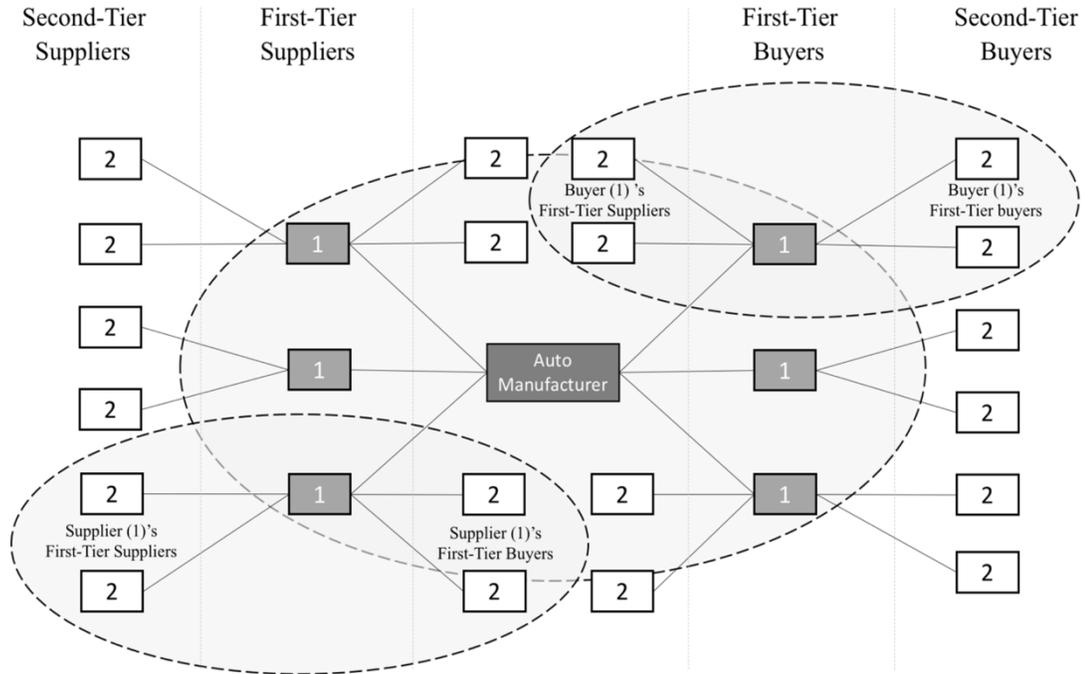
The raw data were collected from Bloomberg's databases through its specialized computer terminal. Within the Bloomberg system, we collected most of the data from two distinct databases. The first, accessed through the SPLC function, provides information on the structure of supply networks by listing the direct buyer and supplier relationships for a specific base firm. Figure 2.4 illustrates the basic structure of how the supply network data were structured in our final sample. We began the process by choosing an auto

manufacturer as the base company. After recording its direct relationships, we chose the first supplier on the list and proceeded to record its relationships—both its buyers and suppliers. We repeated that process for all the first-tier suppliers, then moved to the auto manufacturer's first-tier buyers and performed the same procedure. This process was repeated for all of the auto manufacturers listed in Table 2.1. At first, we listed a total of 123,858 buyer-supplier relationships among 10,726 individual firms, but once all redundancies were removed from the list, a total of 45,044 of those relationships remained (Bloomberg, 2015).

All the buyer-supplier relationships included in this study are inter-firm, or business to business relationships. Examples of car manufacturers suppliers are manufacturers of intermediate products, such as automotive components and modules that go into the assembly of automobiles. Examples of buyers are auto dealerships, car rental companies, and transportation companies. Since auto manufacturers are positioned close to the end of the industry's value chain, the downstream tiers contain a much smaller number of firms.

We then accessed the second database through the terminal's ESG function to download information regarding each firm's environmental, social, and governance performance. The database consists of four scores. The first three refer to the three areas just cited, while the fourth is an aggregate measure of all three. The process of downloading the SPLC and ESG data, as well as the other more generic variables (such as return on assets and total sales) from Bloomberg was done through an interface linking Bloomberg's system to Microsoft Excel (Bloomberg, 2015).

FIGURE 2.4
Network data structure



2.4.1. *Dependent Variable*

Corporate Sustainability Diffusion Performance (CS_Diff) refers to the level of effectiveness with which any firm is able to diffuse its corporate sustainability strategies throughout the network. Its value is calculated as the sum of the ESG disclosure scores of all the firms to which the company in question is directly connected. The *ESG Disclosure Score*, or the *Environmental, Social and Governance Information Disclosure Score*, is a proprietary Bloomberg measure that aggregates the disclosure of corporate information on the environmental, social, and governance areas of sustainability. This score ranges from 0.1 for companies that disclose a minimum amount of data to 100 for those that disclose every data point collected by Bloomberg. Each data point is weighted in terms of importance, with data such as *Greenhouse Gas Emissions* carrying greater weights than

other disclosures (Bloomberg, 2015). See the Appendix for a detailed description of the information that composes the ESG Disclosure Score.

2.4.2. Independent Variables

Relative Resource Value: this variable is calculated based upon two variables extracted from Bloomberg's SPLC function. The SPLC function, as previously discussed, provides information on the structure of supply networks by mapping the relationships between a company and its suppliers, customers and competitors. The Supply Chain Revenue Percentage stands for the percentage of a supplier's revenue that is received from a buyer and, thus, represents the Relative Value of the resources of that buyer to that supplier. Conversely, the Supply Chain Cost Percentage, which stands for the percentage of a buyer's total cost that is destined toward paying a supplier, represents the Relative Value of the resources of the latter to the former. Using these two variables, we calculate a firm's resource dominance within each of the dyads to which it belongs—that is, between itself and each of its direct relationships regardless of whether they are buyers or suppliers. The Net Relative Value of Firm (A) in relation to Firm (B) is calculated by subtracting the value of B's resources to A, from the value of A's resources to B. After A's Dominance is calculated for each of the dyads to which it belongs, the sum will be equal to its Resource Dominance in relation to the network as a whole (Bloomberg, 2015).

Resource substitutability: refers to the levels of rarity, inimitability, and non-substitutability of any given firm's resources. Therefore, we used the number of competing companies as a proxy for substitutability. We adopted "number of competitors as reported by the firm" (Bloomberg, 2015), as our measure of resource substitutability due to two reasons. The first is that the other available measurements were made according to the

firm's generic industrial activity, thus, we found that those numbers could be misleading as they could consider producers of similar, but non-substitute products as competitors, and could fail to consider the producers of less similar products, but that could be used as imperfect substitutes. Our reasoning was that, each firm's direct knowledge of their business activities would be better able to report on the number of firms it considers as competitive threats, both directly and indirectly. The second reason has to do with the fact that our sample contains a large number of industrial sectors, sub-sectors, groups and sub-groups. Since the other available measures were all specific to these categories, we decided to adopt the current measure because it applied to all firms in the sample.

Relative Network Position: was measured using the value of each firm's eigenvector centrality. In order to account for each firm's total diffusion potential, we took into consideration each of their direct and indirect relationships (as explained earlier). We used Gephi version 0.8.2, an open-source software specialized in graph and network analysis, to calculate the eigenvector centrality for each of the firms in the network. Our choice of software was based on its ability to deal with large networks, providing a series of measurements and statistics as well as a clear visualization of the network. This graphic representation of the network allowed us to visually explore various aspects of the data, including the recognition and correction of inconsistencies in the process of filtering and removing redundancies from the sample.

2.4.3. Control Variables

Geographical Location: companies were grouped into four world regions according to the country in which their headquarters are domiciled (Bloomberg). The regions are: (1) W_Region: Americas (North America, Central America, and South

America); (2) Europe (Europe and Eastern Europe); (3) Australasia_Japan (Australasia and Japan); and (4) Asia_Africa (Africa, Asia Pacific (excluding Japan), India/Bangladesh/Pakistan, and the Middle East).

Value Chain: dummy variable was created as a binary categorization of firms as belonging (“1”) or not belonging (“0”) to the automobile’s value chain. To differentiate between these two groups, we used the Bloomberg Industry Classification System (BICS), which categorizes companies based upon their business or economic functions and characteristics into three levels of specificity: industrial sectors, industrial groups, and industrial subgroups (Bloomberg, 2015). A value of “1” was assigned to firms performing activities that are closely related to the production of automobiles and a “0” to those engaged in activities that are not directly connected to the auto value chain. Starting from the most general activity descriptions (industrial sector), we moved to more fine-grained levels (industrial groups and subgroups) according to how difficult it was to discern the firm’s main activity. For example, while we included the entire basic materials sector, the consumer, cyclical sector was less clear-cut. Industrial groups within that sector included, among others: (A) auto manufacturers, (B) auto parts and equipment, (C) leisure time (cruise lines), (D) entertainment (theaters), and (E) retail. In those cases, firms belonging to industrial groups (A) and (B) were assigned a “1,” those in (C) and (D) were assigned a “0,” and those in (E) had to be evaluated at the industrial subgroup level, which, for instance, included: (a) retail: automobiles, (b) retail: auto parts, (c) retail: convenience store, (d) retail: pet food and supplies, and (e) retail: jewelry. In these cases, (a) and (b) were coded as “1,” while the remaining three were coded as “0.” This process resulted in 5,573 firms being assigned a “1” and 5,154 a “0” or 52 percent and 48 percent, respectively.

Past Performance: used as the measure of past financial performance to control for endogenous causation, and it was measured as the firm's return on assets (ROA) for the year (Bloomberg, 2015).

Firm Ownership: is a dummy variable used to differentiate whether firms are private ("1") or publicly listed ("0").

ESG Disclosure Score: Bloomberg's proprietary measure that aggregates the disclosure of corporate environmental, social, and governance information. This score ranges from 0.1 for companies that disclose a minimum amount of environmental, social, and governance data to 100 for those that disclose every data point collected by Bloomberg. Each data point is weighted in terms of importance, with data such as Greenhouse Gas Emissions carrying greater weight than other disclosures (Bloomberg, 2015). See the Appendix for a detailed description of the information that composes the ESG Disclosure Score.

Firm Tier: was measured according to the shortest path, or geodesic distance, between an auto manufacturer and the firm in question. Since we had three tiers in total, the tier containing the auto manufacturers was numbered zero, the first tier numbered one, and the second tier numbered two.

Firm Size: measured by the total sales revenue figure reported by the company for the year of 2014.

2.5. Results and Discussion

The hypotheses in this study were tested by employing ordinary least squares (OLS) cross-sectional regressions. To avoid problems of collinearity among variables, we examined bivariate correlations and computed variance inflation factors (VIF). The

correlations among explanatory and control variables were not large enough to raise concerns about multicollinearity, and VIFs fell within an acceptable range, from 1.01 to 1.52. Moreover, we checked all regression models for independence of errors, equality of variance, and normality of residuals in order to determine their adequacy. To mitigate the potential for omitted variable bias caused by the correlation among endogenous variables and the error terms, all independent variables were lagged one year. There were a number of missing values, so from our original sample of 10,726 members of the automotive industry's network, we were able to use 2,457. This still constitutes a highly representative sample of the total population.

Table 2.2 consists of three models. Model (I) is the base model, including only control variables. Model (II) adds Relative Resource Value and Eigenvector Centrality, in reference to direct effects tested in Hypotheses 1 and 3, respectively. Finally, Model (III) represents the full model, which introduces the two interaction terms, Relative Resource Value X Resource Substitutability and Relative Resource Value X Eigenvector Centrality to which Hypotheses 2 and 4 refer, respectively.

The econometric specification of the full model is as follows:

$$\begin{aligned}
 CS_Diffusion_{2015} = & \beta_0 + \beta_1 Americas + \beta_2 Europe + \beta_3 Asia_Pacific_Africa + \\
 & \beta_4 Australia_Japan + \beta_5 Auto_Value_Chain + \beta_6 Ownership + \beta_7 ROA_{2014} + \\
 & \beta_8 ESG_{2014} + \beta_9 Tier + \beta_{10} Size + \beta_{11} Relative_Resource_Value + \\
 & \beta_{12} Resource_Substitutability + \beta_{13} Relative_Network_Position + \\
 & \beta_{14} (Relative_Resource_Value \cdot Resource_Substitutability) + \\
 & \beta_{15} (Relative_Resource_Value \cdot Relative_Network_Position) + \varepsilon
 \end{aligned}$$

Results in Model (II) regarding Hypothesis 1 display a positive and highly significant ($p < 0.001$) coefficient, strongly supporting the fact that Relative Resource Value has a positive effect on Corporate Sustainability Diffusion Performance. Hypothesis 3 was strongly supported, since the coefficient for Relative Network Position is positive and highly significant ($p < 0.001$). This corroborates the positive and direct effect of Relative Network Position on Corporate Sustainability Diffusion. In Model (III), results for the interaction terms are highly significant ($p < 0.001$), strongly support Hypotheses 2 and 4. The coefficient for the first interaction is negative, confirming that Resource Substitutability negatively moderates the effects of Relative Resource Value on Corporate Sustainability Diffusion Performance. Conversely, the coefficient of the second interaction term is positive, which, in this case, confirms that Relative Network Position positively moderates the effects of Resource Dominance on Corporate Sustainability Diffusion Performance in supply networks.

The model also shows good explanatory power. Model 2 shows a very significant improvement in the R-squared, from 0.21 to 0.31. Model (III) shows a more modest rise in the R-squared to 0.32. Nevertheless, the adjusted R-squared also improved from 0.31 to 0.32 after the inclusion of the two interaction terms and the resulting loss in degrees of freedom, thus, providing some validation for the inclusion of those last two variables in the model.

Although our current data limits us to a cross-sectional analysis of the problem, rendering it difficult to establish strong cause and effect relationships. Nonetheless, since we are continuing to collect this data overtime (yearly), we expect that in a future longitudinal analysis, these cause and effect relationships will be confirmed.

We could also observe some interesting results regarding the effects of some of our control variables. Regarding Geographical Location, we used Australasia and Japan as the base variable and found significant effects for both the Americas and Europe, which seem to suggest a significant difference in corporate sustainability diffusion performance among these two regions and the base region. The results for Asia Pacific and Africa were not significant due to their lower representativeness in the sample, given the high number of missing values for firms in those regions of the globe. These results seem to suggest that corporate sustainability performance varies in different areas of the world, warranting further investigation the topic.

The significant results for Size, Tier and Relative Network Position all corroborate each other. The positive coefficients for Size and Relative Network Position indicate that larger and more central firms have a higher corporate sustainability diffusion performance, while the negative Tier coefficient indicates that as the tier increases, the corporate sustainability diffusion performance on the second tier is lower than that of the first. This serves as an indication of an outward flow of corporate sustainability diffusion in the network, that is, diffusion starts at the center with the larger (focal) firms, or, auto manufacturers, and spreads towards the more peripheral firms in the sector.

TABLE 2.2
OLS regression results: effects of relative resource value, resource substitutability and relative network position on corporate sustainability diffusion

Independent Variables	(I) CS Diffusion Performance	(II) CS Diffusion Performance	(III) CS Diffusion Performance
Americas	-0.432 *** (0.095)	-0.502 *** (0.088)	-0.466 *** (0.094)
Europe	-0.683 *** (0.113)	-0.696 *** (0.106)	-0.677 *** (0.108)
Asia Pacific & Africa	-0.136 (0.110)	-0.180 (0.102)	-0.145 (0.102)
Australasia & Japan	- -	- -	- -
Automotive Value Chain	0.044 (0.070)	0.035 (0.065)	0.014 (0.065)
Ownership	0.026 (0.229)	0.063 (0.213)	0.055 (0.212)
ROA 2014	-0.005 * (0.003)	-0.005 (0.002)	-0.004 (0.002)
ESG Score 2014	0.016 *** (0.002)	0.010 *** (0.002)	0.011 *** (0.002)
Tier	-0.850 *** (0.084)	-0.317 *** (0.087)	-0.346 *** (0.088)
Size (Total Sales Revenue 2014)	9.28E-08 *** (0.000)	1.73E-08 ** (0.000)	1.24E-08 * (0.000)
Relative Resource Value (Hypothesis 1)		0.246 *** (0.027)	0.294 *** (0.031)
Resource Substitutability			0.002 (0.024)
Relative Network Position (Hypothesis 3)		2.12E-01 *** (0.028)	0.143 *** (0.035)
Interaction: Dominance & Substitutability (Hypothesis 2)			-0.123 *** (0.025)
Interaction: Dominance & Centrality (Hypothesis 4)			0.139 *** (0.033)
Constant	1.544 ** (0.498)	0.620 (0.469)	0.657 (0.467)
Observations	2457	2457	2457
R-Squared	0.21	0.31	0.32
Adjusted R-Squared	0.21	0.31	0.32

* p < 0.05

** p < 0.01

*** p < 0.001 (standard errors in parentheses.)

2.6. Conclusion

This paper provides an empirical examination of how car manufacturers diffuse their corporate sustainability strategies in the global automotive supply network. It makes multiple contributions to the extant literature.

2.6.1. Theoretical and Empirical Contributions

First, the article contributes to the literature by presenting a theoretical framework to explain the factors that enhance or detract from a firm's ability to effectively diffuse corporate sustainability to its network. These factors, which represent network related firm characteristics, are: (1) relative resource value, (2) resource substitutability, and (3) relative network position. From the presented framework, we derived a set of four hypotheses regarding the specific effects of each of these factors on the firm's performance in diffusing corporate sustainability throughout the network. Our results provided strong empirical support for the framework's conceptual claims.

Its second contribution can be characterized by the data itself. In developing the database for this study, we were able to analyze the automotive supply network with unprecedented breadth and depth, allowing us to examine the resource dependence dynamics in relationships among thousands of firms in multiple tiers of the automotive supply network and observe how they affect each other's corporate sustainability behaviors, providing us with detailed insights and generating more solid results.

2.6.2. Managerial Applications

The issues addressed in this paper should be of great interest to managers, especially those in the automotive industry who are involved in the development of sustainable procurement and supply chain management strategies. According to Freeman and McVea, (2001, p. 192), they are the ones who:

“must formulate and implement processes which satisfy all and only those groups who have a stake in the business. The central task in this process is to manage and integrate the relationships and interests of stakeholders in a way that ensures the long-term success of the firm.”

This paper provides managers with tools to better understand their firms' position in the supply network in terms of resource dominance/dependence and to improve it in order to more effectively diffuse their corporate sustainability strategies. By understanding how network-related characteristics affect a firm's diffusion effectiveness, a company may be able to improve its dominance by reconfiguring its resource pool through new and more advantageous relationships, differentiation strategies to make it less substitutable, or by becoming more central to the network by engaging with other well-connected parties in the network.

The next managerial implications relate to network dominance and its antecedents: relative resource value, resource substitutability, and relative network position. We examine the repercussions that the pursuit of network dominance, caused by the focal firm's necessity to mitigate supplier sustainability risk, have on the decision making process of managers in both focal and non-focal firms.

Kotabe et al. (2008) discussed the two leading explanations for managers to outsource their firm's activities, especially when that takes place across countries: cost reduction and specialization (Quinn 1999), and as a means to obtain access the competences of suppliers (Dyer and Singh 1998). The introduction of a triple bottom line approach to firm performance (Carter and Rogers, 2008; Elkington, 1998) especially to focal firms, introduces not only the costs associated with the adoption and implementation of their own corporate sustainability initiatives, but, as we just discussed, cases involving supplier sustainability risk add to business uncertainty and, thus, constitute a new and possibly significant source of transaction costs to the focal firm. Although it has been pointed out that decisions based on transaction costs often fail to accurately weight the true

costs of making versus buying (Kotabe et al., 2008), this has implications to managers of both focal and non-focal firms in the industry.

Based on the introduction of these corporate sustainability constraints, car manufacturers must reduce the risks of being held responsible for sustainability-related misconducts occurred elsewhere in the network. Therefore, these focal firms must reassess their outsourcing strategies to take into consideration the level of supplier sustainability risk to which they are exposed, the necessary levels of network dominance to mitigate that risk to acceptable levels, and, most importantly, the transaction costs involved in reaching such a level of risk. This becomes an even more complex task if we consider that we are still at the early stages of development of corporate sustainability within global supply chains as both a field of study and practice. As the scientific and humanistic bases that support this field quickly and continuously evolve, it should be expected that it will undergo multiple and continuing changes, and so will the demands and tools that accompany it. Therefore, corporate sustainability adds another to the dynamism of the industry, which increases the difficulty for managers to keep their make-or-buy assessment not only accurate, but current. In turn, this may result in yet another

The introduction of these new factors into the make or buy decision process attempt to further reverse the vision put forth and highly promoted by leading car manufacturers in the late 1990s and early 2000s, which was originally based upon modularization and outsourcing (Jacobides et al., 2015). Having reversed the modularization aspect of this vision when suppliers began to threaten their dominant position in the network, car manufacturers' may now find themselves in need to reverse, at least in part, their vision's outsourcing component in order to avoid supplier sustainability risk.

Managers of non-focal firms are also likely to face relevant challenges, most of which will occur in one of two scenarios. The first, considers the maintenance of the *status quo* in terms of the focal firm's outsourcing policies. In this scenario, the managers of non-focal firms will have to deal with intensifying pressures from focal firms regarding the adoption and further diffusion of corporate sustainability goals and initiatives, as well as from potential new competitors. Innovative entrants will not only add to the resource substitutability of incumbent's resources, but given the current stage of the automotive industry, are likely to destroy their relative resource value with the introduction of new, disruptive technologies. The second scenario relates a potential re-integration of the automotive value chain centered around the car manufacturers. This situation would likely lead to the absorption of the most qualified non-focal members of the network by the focal firms, and the alienation of those that fall short of corporate sustainability performance expectations.

The study faces several limitations we hope future research will be able to address. The first of these limitations is the lack of longitudinal data on the structure of these supply chains as well as on the resource dependence structure within each of the firm dyads. Although we have firm-level data spanning several years, the lack of information on the composition of the network for previous years forces us to wait some time to compile data on future configurations of the automotive network. This renders our analysis essentially and inadequately static. This is because such networks are in a constant state of flux, caused by firms entering and exiting outsourcing relationships as they assess and reassess their competitive positions. Finally, this prevents us from confidently establishing a cause-and-effect relationship between resource dominance, resource substitutability, and network

centrality in relation to corporate sustainability diffusion. To mitigate this problem, we have established a protocol to periodically update this database in the future.

This study lays a strong foundation to the study of corporate sustainability propagation in supply networks of corporate sustainability in global supply networks. We see the study of how the retro-feeding relationship between sustainability and innovation plays out in terms of strategic and entrepreneurial behaviors as a very promising area—especially in the automotive industry where these two factors appear to be causing two simultaneous paradigm shifts. The first relates to the concepts of corporate sustainability and sustainable living and how they are increasingly influencing consumer preferences toward safer and more environmentally friendly cars as well as toward a more TBL-based perception of what it means to be a successful car company. The second refers to the technological advances that are allowing the production of such cars and causing profound impacts in the hierarchical structure of the sector. Innovation is playing such a big role in changing this sector that entrepreneurial start-ups like Tesla or giant technology firms without any previous involvement with the sector, such as Google and Apple, are taken seriously as potential new entrants in an industry previously surrounded by very high entry barriers. Incumbent auto manufacturers have not, however, been idle, as they reinvent themselves and seek new strategies to cope with these changes. Another interesting area related to international business strategy is to investigate the effects regional, cultural, and institutional differences may have on corporate sustainability propagation rates.

REFERENCES

- Andersen, M., and Skjoett-Larsen, T. (2009). Corporate social responsibility in global supply chains. *Supply Chain Management: an International Journal*, 14(2), 75–86.
- Ashby, A., Leat, M., and Hudson-Smith, M. (2012). Making connections: a review of supply chain management and sustainability literature. *Supply Chain Management: An International Journal*, 17(5), 497-516.
- Ashforth, B.E., Gibbs, B.W., (1990). The double-edge of organizational legitimation. *Organization Science* 1, 177-194.
- F., (1999). Nike and Pakistani Child Labor, TED Case Studies, Volume 9, Number 2.
- Bansal, P. (2005). Evolving sustainably: a longitudinal study of corporate sustainable development. *Strategic Management Journal*, 26(3), 197–218.
- Bansal, P., and Roth, K. (2000). Why Companies Go Green: A Model of Ecological Responsiveness. *Academy of Management Journal*, 43(4), 717–736.
- Barney, J. (1991), “Firm resources and sustained competitive advantage”, *Journal of Management*, Vol. 17 No. 1, pp. 99-120.
- Barney, J., Wright, M. and Ketchen, D.J. (2001), “The resource-based view of the firm: ten years after 1991”, *Journal of Management*, Vol. 27 No. 6, pp. 625-41.
- Beier, F. J., and Stern, L. W. (1969). Power in the Channel of Distribution. *Distribution channels: Behavioral dimensions*, 92-116.
- Benoit, W. L. (1995). *Accounts, Excuses, and Apologies: A Theory of Image Restoration Strategies*. Albany, NY: State University of New York Press.
- Bhattacharya, C. B., Korschun, D., and Sen, S. (2009). Strengthening stakeholder–company relationships through mutually beneficial corporate social responsibility initiatives. *Journal of Business Ethics*, 85(2), 257-272.
- Bloomberg L.P. (2015) SPLC and ESG data. Retrieved Fall, 2015 from Bloomberg database.
- Carr, A. S., Kaynak, H., Hartley, J. L., and Ross, A. (2008). Supplier dependence: impact on supplier's participation and performance. *International Journal of Operations & Production Management*, 28(9), 899-916.
- Carter, C. R., and Easton, P. L. (2011). Sustainable supply chain management: Evolution and future directions. *International Journal of Physical Distribution & Logistics Management*, 41(1), 46-62.

- Carter, C. R., and Rogers, D. S. (2008). A framework of sustainable supply chain management: moving toward new theory. *International journal of physical distribution & logistics management*, 38(5), 360-387.
- Cartwright, D. (1965), "Influence. Leadership, Control." in *Handbook of Organizations*. James G. March, ed. Chicago: Rand McNally. 1-47.
- Chen, I.J. and Paulraj, A. (2004), "Towards a theory of supply chain management – the constructs and measurement", *Journal of Operations Management*, Vol. 22 No. 2, pp. 119-50.
- Chen, S.-F. S. (2005). Extending internalization theory: a new perspective on international technology transfer and its generalization. *Journal of International Business Studies*, 36(2), 231– 245.
- Chen, Y. J., and Sheu, J.-B. (2009). *Transportation Research Part E. Transportation Research Part E*, 45(5), 667–677.
- Connelly, B.L., Ketchen, D.J., Hult, G.T.M., (2013). Global Supply Chain Management: Toward a Theoretically Driven Research Agenda. *Global Strategy Journal* 3, 227–243.
- Dahl, R. A. (1957). The concept of power. *Behavioral science*, 2(3), 201-215.
- Deegan, C. (2002). Introduction: the legitimising effect of social and environmental disclosures - a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15(3), 282-311.
- Dowling, J., and Pfeffer, J. (1975). Organizational legitimacy: Social values and organizational behavior. *Pacific sociological review*, 122-136.
- Dyer, J. H., and Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of management review*, 23(4), 660-679.
- Elkington, J., (1998), *Cannibals with Forks: The Triple Bottom Line of the 21st Century*, New Society, Stoney Creek, CT.
- Emerson, R. M. (1962). Power-dependence relations. *American sociological review*, 31-41.
- Fortanier, F., Kolk, A., and Pinkse, J. (2011). Harmonization in CSR reporting. *Management International Review*, 51(5), 665-696.

- Freeman, R.E. (2002). Stakeholder Theory of the Modern Corporation. In Donaldson, T. and Werhane, P. (Eds), *Ethical Issues in Business: A Philosophical Approach*, Prentice Hall, Englewood Cliffs, NJ, pp. 38-48.
- Freeman, R.E. and Mcvea, J., (2001). A Stakeholder Approach to Strategic Management. In Hitt, M.A., Freeman, R.E., and Harrison, J.S., (Eds), *The Blackwell handbook of strategic management*, Blackwell, Malden, MA (2001), pp. 189-208.
- French, John R. P. and Bertram Raven (1959). "The Bases of Social Power," in *Studies in Social Power*, Dorwin Cartwright, ed. Ann Arbor: University of Michigan Press.
- Gallo, P.J., Jones Christensen, L., (2011). Firm size matters: an empirical investigation of organizational size and ownership on sustainability-related behaviors. *Business & Society* 50, 315-349.
- Gaski, J. F. (1984). The Theory of Power and Conflict in Channels of Distribution. *Journal of Marketing*, 48(3), 9–29.
- Gereffi, G. (1999). 'International trade and industrial upgrading in the apparel commodity chain', *Journal of International Economics* 48(1): 37–70.
- Gnyawali, D. R., and Madhavan, R. (2001). Cooperative networks and competitive dynamics: A structural embeddedness perspective. *Academy of Management review*, 26(3), 431-445.
- Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360–1380.
- Groves, C., Frater, L., Lee, R., and Stokes, E. (2011). Is there room at the bottom for CSR? Corporate social responsibility and nanotechnology in the UK. *Journal of business ethics*, 101(4), 525-552.
- Gulati, R. (1999). Network location and learning: The influence of network resources and firm capabilities on alliance formation. *Strategic management journal*, 20(5), 397-420.
- Gulati, R., and Gargiulo, M. (1999). Where Do Interorganizational Networks Come From?. *American Journal of Sociology*, 104, 177-231.
- Gulati, R., Nohria, N., and Zaheer, A., (2000). Strategic networks. *Strategic management journal*, 21(3), 203.
- Haddock, J. (2005). Consumer influence on internet-based corporate communication of environmental activities: the UK food sector. *British Food Journal*, 107(10), 792-805.

- Hahn, R., and Kühnen, M. (2013). Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production*, 59, 5–21.
- Hajmohammad, S., and Vachon, S. (2016). Mitigation, Avoidance, or Acceptance? Managing Supplier Sustainability Risk. *Journal of Supply Chain Management*, 52(2), 48–65.
- Hall, J. (2000). Environmental supply chain dynamics. *Journal of Cleaner Production*, 8(6), 455–471.
- Hillman, A. J., Withers, M. C., Collins, B. J., (2009). Resource dependence theory: A review. *Journal of management*, 35(6), 1404-1427.
- Hoffman, E. (2016, July). IBISWorld Industry Report C2533-GL. Global Automobile Engine & Parts Manufacturing. Retrieved from ibisworld.com
- Hofmann, H., Busse, C., Bode, C., and Henke, M. (2014). Sustainability-related supply chain risks: Journal of Supply Chain Management Conceptualization and management. *Business Strategy & the Environment*, 23, 160–172.
- Howard-Grenville, J., Buckle, S. J., Hoskins, B. J., George, G., (2014). Climate Change and Management. *Academy of Management Journal* 57, 615–623
- Hult G.T.M., (2004). Global supply chain management: an integration of scholarly thoughts. *Industrial Marketing Management* 33(1): 3–5
- Jacobides, M. G., MacDuffie, J. P., and Tae, C. J. (2015). Agency, structure, and the dominance of OEMs: Change and stability in the automotive sector. *Strategic Management Journal*, 37(9), 1942–1967.
- Jayaraman, V., Klassen, R., and Linton, J. D. (2007). Supply chain management in a sustainable environment. *Journal of Operations Management*, 25(6), 1071-1074.
- Jenkins, R. (2001), *Corporate Codes of Conduct. Self-Regulation in a Global Economy*, United Nations Research Institute for Social Development, Geneva.
- Jiang, B., Baker, R. C., and Frazier, G. V. (2009). An analysis of job dissatisfaction and turnover to reduce global supply chain risk: Evidence from China. *Journal of Operations Management*, 27, 169–184.
- Kotabe, M. (1998). Efficiency vs. Effectiveness Orientation of Global Sourcing Strategy: A Comparison of U.S. and Japanese Multinational Companies. *The Academy of Management Executive* (1993-2005), 12(4), 107–119.

- Kotabe, M., Mol, M. J., and Ketkar, S. (2008). An evolutionary stage model of outsourcing and competence destruction: A triad comparison of the consumer electronics industry. *Management International Review*, 48(1), 65-94.
- Kotabe, M., and Mudambi, R. (2009). Global sourcing and value creation: opportunities and challenges. *Journal of International Management*, 15(2), 121-125.
- Kotabe, M., and Murray, J. Y. (2004). Global sourcing strategy and sustainable competitive advantage. *Industrial Marketing Management*, 33(1), 7-14.
- Krause, D. R., Vachon, S., and Klassen, R. D. (2009). Special topic forum on sustainable supply chain management: Introduction and reflections on the role of purchasing management. *Journal of Supply Chain Management*, 45(4), 18-25.
- Lambert, D. M., and Cooper, M. C. (2000). Issues in supply chain management. *Industrial Marketing Management*, 29(1), 65-83.
- Lim, S.-J., and Phillips, J. (2008). Embedding CSR values: The global footwear industry's evolving governance structure. *Journal of Business Ethics*, 81(1), 143-156.
- Linton, J., Klassen, R., Jayaraman, V., (2007). Sustainable supply chains: An introduction. *Journal of Operations Management*, 25(6), 1075–1082.
- Locke, R. M. (2002). The Promise and Perils of Globalization: The Case of Nike. *Industrial Performance Center Working Paper Series*, 1–36.
- Madu, C. N., Kuei, C. H., and Winokur, D. (1995). Environmental quality planning: a strategic total quality management (STQM) approach. *Futures*, 27(8), 839-856.
- Marshall, S., Vaiman, V., Napier, N., Taylor, S., Haslberger, A., and Andersen, T. (2010). The end of a “period”: Sustainability and the questioning attitude. *Academy of Management Learning & Education*, 9(3), 477-487.
- Mayer-Schönberger, V., and Cukier, K. (2013). *Big data: A revolution that will transform how we live, work, and think*. Houghton Mifflin Harcourt.
- Mayer, K. J., and Sparrowe, R. T. (2013). Integrating theories in AMJ articles. *Academy of Management Journal*, 56(4), 917-922.
- McEvily, B., and Marcus, A. (2005). Embedded ties and the acquisition of competitive capabilities. *Strategic management journal*, 26(11), 1033-1055.
- McIntyre, K. (2007). Delivering sustainability through supply chain management. In D. Waters (Ed.), *Global Logistics - New directions in supply chain management* (pp. 245-260). London, England: Kogan Page.

- Miemiczyk, J., Johnsen, T. E., Macquet, M., (2012). Sustainable purchasing and supply management: a structured literature review of definitions and measures at the dyad, chain and network levels. *Supply Chain Management: An International Journal* 17, 478–496.
- Miles, R. E., and Snow, C. C. (1986). *Organizations: New Concepts for New Forms*. *California Management Review*, 28(3), 62–73.
- Miller, D., and Shamsie, J. (1996). The resource-based view of the firm in two environments: The Hollywood film studios from 1936 to 1965. *Academy of management journal*, 39(3), 519-543.
- Mudambi, R. (2008). Location, control and innovation in knowledge-intensive industries. *Journal of Economic Geography*, 8(5), 699–725. <http://doi.org/10.1093/jeg/lbn024>
- Mudambi, R., and Venzin, M. (2010). The Strategic Nexus of Offshoring and Outsourcing Decisions. *Journal of Management Studies*, 47(8), 1510–1533.
- Neef, D. (2004). *The Supply Chain Impetrative: How to Ensure Ethical Behavior in Your Global Suppliers*. New York: American Management Association.
- New, S., Green, K., and Morton, B. (1997). The sustainable supply chain: theoretical perspectives and practical developments. Unpublished Working Paper. Hertford College, Oxford and Manchester School of Management, UMIST.
- Parsa, S., and Kouhy, R. (2008). Social reporting by companies listed on the alternative investment market. *Journal of Business Ethics*, 79(3), 345-360.
- Penrose, E.T. (1959), *The Theory of the Growth of the Firm*, Wiley, New York, NY.
- Peters, N. J., Hofstetter, J. S., and Hoffmann, V. H. (2011). Institutional entrepreneurship capabilities for interorganizational sustainable supply chain strategies. *The International Journal of Logistics Management*, 22(1), 52–86.
- Pfeffer, J., and Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. New York, NY: Harper & Row.
- Quinn, J. B. (1999). Strategic outsourcing: leveraging knowledge capabilities. *MIT Sloan Management Review*, 40(4), 9.
- Reuter, C., Foerstl, K., Hartmann, E., and Blome, C. (2010). Sustainable global supplier management: The role of dynamic capabilities in achieving competitive advantage. *Journal of Supply Chain Management*, 46(2), 45-63.

- Roehrich, J. K., Grosvold, J., and Hoejmoose, S. U. (2014). Reputational risks and sustainable supply chain management: Decision making under bounded rationality. *International Journal of Operations & Production Management*, 34, 695–719.
- Schiller, H., (2010, May). Analysis: Apple's Supply Chain - iResponsibility. *Ethical Corporation*, 9.
- Scott, W. R., and Davis, G. F. (2007). *Organizations and Organizing: Rational, Natural, and Open System Perspectives*. Upper Saddle River, NJ: Pearson-Prentice Hall.
- Seuring, S. (2013). A review of modeling approaches for sustainable supply chain management. *Decision Support Systems*, 54(4), 1513-1520.
- Seuring, S., and Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16(15), 1699-1710.
- Skjøtt-Larsen, T., Schary, P.B., Mikkola, J.H., Kotzab, H. (2007). In: *Managing The Global Supply Chain*, third ed. Copenhagen Business School Press.
- Sotorrió, L.L., and Sánchez, J.L.F. (2010). Corporate social reporting for different audiences: The case of multinational corporations in Spain. *Corporate Social Responsibility and Environmental Management*, 17(5), 272-283.
- Souza, G. C., Zhao, Z., and Chen, M. (2004). Coordinating sales and raw material discounts in a global supply chain. *Production & Operations Management*, 13(1), 34-45.
- Stohl, C., Stohl, M., and Popova, L. (2009). A New Generation of Corporate Codes of Ethics. *Journal of Business Ethics*, 90(4), 607–622.
- Stuart, T. E. (1998). Network positions and propensities to collaborate: An investigation of strategic alliance formation in a high-technology industry. *Administrative science quarterly*, 668-698.
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of management review*, 20(3), 571-610.
- The Volkswagen scandal. A mucky business. (2016, September 26). *The Economist*.
- Ulrich, D., and Barney, J. B. (1984). Perspectives in organizations: Resource dependence, efficiency, and population. *Academy of Management Review*, 9(3), 471–481.
- van Bommel, H. W. M. (2011). A conceptual framework for analyzing sustainability strategies in industrial supply networks from an innovation perspective. *Journal of Cleaner Production*, 19(8), 895–904.

- WCED (1987). *Our Common Future*, World Commission on Environment and Development, Oxford University Press, Oxford, p. 43.
- Webb, T., (2007, October). Nike and sustainability: Making the running for business ethics. *Ethical Corporation*, 47-49.
- Williams H, Medhurst J, Drew K. (1993). Corporate strategies for a sustainable future. In: Fischer K, Schot J, editors. *Environmental Strategies for Industry*. Washington, DC: Island Press.
- Winter, M., and Knemeyer, A. M. (2013). Exploring the integration of sustainability and supply chain management: Current state and opportunities for future inquiry. *International Journal of Physical Distribution & Logistics Management*, 43(1), 18–38.
- Zaheer, A., and Bell, G. G. (2005). Benefiting from network position: firm capabilities, structural holes, and performance. *Strategic Management Journal*, 26(9), 809–825.
- Zaheer, A., Gözübüyük, R., and Milanov, H. (2010). It's the connections: The network perspective in interorganizational research. *The Academy of Management Perspectives*.

**APPENDIX:
BLOOMBERG'S ENVIRONMENTAL, SOCIAL, AND GOVERNANCE
SUSTAINABILITY CRITERIA.**

Environmental Disclosure Score: Score based on the extent of a company's environmental disclosure as part of Environmental, Social and Governance (ESG) data. The score ranges from 0.1 for companies that discloses minimum amount of ESG data to 100 for those that disclose every data point collected by Bloomberg. Each data point is weighted in terms of importance, with data such as Greenhouse Gas Emissions carrying greater weight than other disclosures.

Social Disclosure Score: Score based on the extent of a company's social disclosure as part of Environmental, Social and Governance (ESG) data. The score ranges from 0.1 for companies that discloses minimum amount of social data to 100 for those that disclose every data point collected by Bloomberg. Each data point is weighted in terms of importance, with workforce data carrying greater weight than other disclosures. The score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector.

Governance Disclosure Score: Score based on the extent of a company's governance disclosure as part of Environmental, Social and Governance (ESG) data. The score ranges from 0.1 for companies that discloses minimum amount of governance data to 100 for those that disclose every data point collected by Bloomberg. Each data point is weighted in terms of importance, with board of directors data carrying greater weight than other disclosures. The score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector.

Total GHG Emissions (Thousand Tonnes): Total Greenhouse Gas (GHG) Emissions of the company, in thousands of metric tons. Greenhouse Gases are defined as those gases which contribute to the trapping of heat in the Earth's atmosphere and they include Carbon Dioxide (CO₂), Methane, and Nitrous Oxide. Total GHG Emissions as defined in this field, equals the total of company Scope 1 and Scope 2 emissions. It does not include Scope 3 emissions. Definition of Scope 3 emissions remains subject to much interpretation and therefore there is significant variability in company reported data - this could cause undue variation in company Total GHG emissions figure. Emissions reported as CO₂ only will NOT be captured in this field. Emissions reported as generic GHG emissions or CO₂ equivalents (CO₂e) will be captured in this field.

Total Energy Consumption (MWh): Total Energy Consumption Figure in thousands of megawatt hours (MWh). This field might include energy directly consumed through combustion in owned or controlled boilers, furnaces, vehicles, or through chemical production in owned or controlled process equipment. It also includes energy consumed as electricity.

Total Water Use: Total amount of water used to support a company's operational processes, in thousands of cubic meters. The sum of all water withdraws for process water and cooling water and all water retained by company facilities through recycling.

Hazardous Waste (Thousand Tonnes): Amount of hazardous waste the company discards, in thousands of metric tons.

Total Waste (Thousand Tonnes): Total amount of waste the company discards, both hazardous and non-hazardous, in thousands of metric tons.

Travel Emissions (Thousand Tonnes): Travel Emissions Carbon dioxide (CO₂) emissions associated with employee travel, in thousands of metric tons. Travel Emissions are defined as those generated by company employees when conducting business travel by air, rail and any other vehicles. NOTE: employee car travel excludes employee commuting and business travel by company owned vehicle. Business travel by company owned vehicles, reported as CO₂ emissions, should be captured as Direct CO₂ emissions. Travel Emissions expressed as generic Greenhouse Gas emissions or CO₂ equivalents (CO₂e) will not be captured in this field.

GHG Scope 1: Direct Greenhouse Gas (GHG) Emissions of the company, in thousands of metric tons. GHG are defined as those gases which contribute to the trapping of heat in the Earth's atmosphere and they include Carbon Dioxide (CO₂), Methane, and Nitrous Oxide. Scope 1 Emissions are those emitted from sources that are owned or controlled by the reporting entity. Examples of Direct Emissions include emissions from combustion in owned or controlled boilers, furnaces, vehicles , emissions from chemical production in owned or controlled process equipment. Emissions reported as CO₂ only will NOT be captured in this field. Emissions reported as generic GHG emissions or CO₂ equivalents (CO₂e) will be captured in this field.

GHG Scope 2: Indirect Greenhouse Gas (GHG) Emissions of the company in thousands of metric tons. Greenhouse Gases are defined as those gases which contribute to the trapping of heat in the Earth's atmosphere and they include Carbon Dioxide (CO₂), Methane, and Nitrous Oxide. Scope 2 Emissions are those emitted that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity. The principle source of Indirect Emissions is emissions from purchased electricity,

steam and/or heating/cooling. These emissions physically occur at the facility where electricity/steam/heating/cooling is generated. Emissions reported as CO₂ only will NOT be captured in this field. Emissions reported as generic GHG emissions or CO₂ equivalents (CO₂e) will be captured in this field.

GHG Scope 3: Greenhouse Gas (GHG) Emissions of the company, in thousands of metric ton. Greenhouse Gases are defined as those gases which contribute to the trapping of heat in the Earth's atmosphere and they include Carbon Dioxide (CO₂), Methane, and Nitrous Oxide. Scope 3 emissions are all non-scope 2, indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. Transmission & Distribution losses) not covered in Scope 2, outsourced activities, waste disposal, etc. Emissions reported as CO₂ only will NOT be captured in this field. Emissions reported as generic GHG emissions or CO₂ equivalents (CO₂e) will be captured in this field.

Electricity Used: Total amount of electricity used by the company. In thousands of megawatt hours (MWh).

Renewable Energy Use (MWh): Amount of energy consumed that was generated by a renewable energy source, in thousands of megawatt hours (MWh). This includes REC (Renewable Energy Certificates) amounts company purchased as well.

Fuel Used - Natural Gas: Total volume of natural gas used as fuel by the company during the reporting period, in thousands of cubic meters. Field includes gas and gas-liquids primarily composed of methane, including natural gas, liquefied natural gas (LNG), compressed natural gas (CNG), and City/Town Gas in Japan. This field does not include

gas or gas-liquids from any other type or mixture of gases, such as liquefied petroleum gas (LPG) or propane.

Waste Recycled (Thousand Tonnes): Total amount of waste the company recycles, in thousands of metric tons.

Energy Efficiency Policy: Indicates whether the company has implemented any initiatives to make its use of energy more efficient. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Emissions Reduction: Indicates whether the company has implemented any initiatives to reduce its environmental emissions to air. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Environmental Supply Chain Management: Indicates whether the company has implemented any initiatives to reduce the environmental footprint of its supply chain. Environmental footprint reductions could be achieved by reducing waste, by reducing resource use, by reducing environmental emissions, by insisting on the introduction of environmental management systems etc. in the supply chain. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Green Building Policy: Indicates whether the company has taken any steps towards using environmental technologies and/or environmental principles in the design and construction of its buildings. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Waste Reduction Policy: Indicates whether the company has implemented any initiatives to reduce the waste generated during the course of its operations. "N" indicates that the

company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Water Policy: Indicates whether the organization has undertaken any initiatives to reduce the quantity of water used or to improve the efficiency of its processes, and whether the company is considering the potential water stress to its areas of operation.

Sustainable Packaging: Indicates whether the company has taken any steps to make its packaging more environmentally friendly. This might include efforts to improve the recyclability of packaging, to use less environmentally damaging materials in packaging etc. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Environmental Quality Management Policy: Indicates whether the company has introduced any kind of environmental quality management and/or environmental management system to help reduce the environmental footprint of its operations. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Climate Change Opportunities Discussed: Indicates whether the Management Discussion and Analysis (MD&A) and its equivalent section of company's annual report discuss business opportunities related to climate change. This is marked "Y" when MD&A explicitly mentions opportunities associated with climate change.

Risks of Climate Change Discussed: Indicates whether the Management Discussion and Analysis (MD&A) and its equivalent section of company's annual report discuss business risks related to climate change. This is marked "Y" when MD&A explicitly mentions risks associated with climate change.

Climate Change Policy: Indicates whether the company has outlined its intention to help reduce global emissions of the Greenhouse Gases that cause climate change through its ongoing operations and/or the use of its products and services. Examples might include efforts to reduce Greenhouse Gas (GHG) emissions, efforts to improve energy efficiency, efforts to derive energy from cleaner fuel sources, investment in product development to reduce emissions generated or energy consumed in the use of the company's products etc. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

New Products - Climate Change: Indicates whether the company has developed and/or launched products during the current period only which address future impacts of climate change and/or which mitigate customers' contributions to climate change by reduced Green House Gas (GHG) emissions. The products may or may not be new to the market.

Biodiversity Policy: Indicates whether the company has implemented any initiatives to ensure the protection of biodiversity. This might include trees and vegetation as well as wildlife and endangered species.

Verification Type: Indicates whether the company's environmental policies were subject to an independent assessment for the reporting period.

Number of Employees: This is the total number of company employees at the end of the reporting period disclosed in the company's Corporate Responsibility reports. The number should represent the total for the below figures disclosed by the company.

Social Supply Chain Management: Indicates whether the company has implemented any initiatives to reduce the social risks in its supply chain. Social risks might include poor working conditions, the use of child or forced labor, lack of a living, fair or minimum wage

etc. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Sustain Sup Guidelines Encomp ESG Area Pub Disclosed: Indicates whether a supplier's guidelines, that encompass all Environmental, Social and Governance (ESG) areas, are publicly disclosed.

Number Supplier Facilities Audited: Number of supplier facilities audited. Suppliers can be audited by company or by third party. Audits include first-time and repeat audits. Audits are concerned specifically with the management of environmental and social risks. Examples would include working conditions, evidence of child labor, pollution management etc. This field is available for companies in the technology, industrials, consumer discretionary and consumer staples sectors.

Fair Remuneration Policy: Indicates if the company has demonstrated a group wide commitment to ensure payment of a fair (could be defined as minimum, living, or some other criteria) wage to all Group employees, even in those countries that do not legally require a minimum wage.

Employee CSR Training: Discloses whether the company conducts training courses for employees on Corporate Social Responsibility (CSR). Japan: Data may be provided by CanPan.

Equal Opportunity Policy: Indicates whether the company has made a proactive commitment to ensure non-discrimination against any type of demographic group. This could be in the form of an equal opportunities policy, as described by the company.

Human Rights Policy: Indicates whether the company has implemented any initiatives to ensure the protection of the rights of all people it works with. "N" indicates that the

company has not explicitly disclosed any such efforts in its most recent Annual or Company Responsibility reports.

Policy Against Child Labor: Indicates whether the company has implemented any initiatives to ensure the prevention of child labor in all parts of its business. "N" indicates that the company has not explicitly disclosed any such efforts in its most recent annual or company responsibility reports.

Business Ethics Policy: Indicates whether the company has established ethical guidelines and/or a compliance policy for its non-management/executive employees in the conduct of company business. 'N' indicates the company has not explicitly disclosed this policy in its most recent Annual or Company Responsibility Reports.

UN Global Compact: Indicates whether the company is a signatory of the United Nations Global Compact.

Size of the Board: Number of Directors on the company's board, as reported by the company. Full time Directors only. Deputy members of the Board will not be counted. Europe: Where the company has a Supervisory Board and a Management Board, this is the number of Directors on the Supervisory Board.

Number of Independent Directors: Number of Independent Directors on the company's board, as reported by the company. Independence is defined according to the company's own criteria. Europe: Where the company has a Supervisory Board and a Management Board, this is the number of Independent Directors on the Supervisory Board.

Board Duration (Years): Length of a board member's term, in years. For boards which allow renewal of terms, it is the length of a single term prior to renewals.

Number of Board Meetings for the Year: Total number of corporate board meetings held in the past year.

Board Meeting Attendance %: Percentage of members in attendance at board meetings during the period.

Number of Employee Representatives on the Board: Number of employee representatives on the board when companies have non-executive employee representatives.

CEO Duality: Indicates whether the company's Chief Executive Officer is also Chairman of the Board, as reported by the company. "N" indicates the two roles are separate.

Independent Chairperson: Indicates whether the company chairperson was independent as of the fiscal year end wherever available, otherwise as at date of latest filing. Independence is defined according to the company's own criteria. Where the company has a two-tier board, this field refers to the chairperson of the supervisory board.

Number of Women on Board: Number of female directors on the company board, as of the fiscal year end wherever available, otherwise as at date of latest filing. Where the company has a two-tier board, this field refers to the supervisory board.

Female Chief Executive Officer or Equivalent: Indicates whether the company Chief Executive Officer (CEO) or equivalent is female, as of the fiscal year end wherever available, otherwise as of the date of the latest filing. Where the company has a two-tier board, this field refers to the chairperson of the management board.

Female Chairperson or Equivalent: Indicates whether the company chairperson or equivalent is female, as of the date of the last filing. Where the company has a two-tier board, this field refers to the chairperson of the supervisory board.

Number of Female Executives: Number of female executives, as of the fiscal year end wherever available, otherwise as of the date of the latest filing. Executives are as defined by the company, or those individuals that form the company executive committee/board or management committee/board or equivalent.

CSR/Sustainability Committee: Indicates whether the company has a corporate social responsibility (CSR)/sustainability (or equivalent) committee that reports directly to the board. This field will not return "Y" if the company only has a Health and Safety Committee.

Non-Executive Director with Responsibility for CSR: Indicates whether there is a non-executive director on the board with responsibility for corporate social responsibility (CSR)/sustainability. This field will not return "Y" if there is a non-executive director on the board with responsibility for health and safety only. Where the company has a two-tier board, this field refers to the supervisory board.

Executive Director with Responsibility for CSR: Indicates whether there is an executive director on the board with responsibility for corporate social responsibility (CSR)/sustainability. This field will not return "Y" if there is a non-executive director on the board with responsibility for health and safety only. Where the company has a two-tier board, this field refers to the supervisory board.

Executive Compensation Linked to ESG: Indicates whether executive compensation is linked to Environmental, Social and Governance (ESG) goals.

ESG Linked Compensation for Board: whether board compensation is linked to Environmental, Social and Governance (ESG) goals.

GRI Criteria Compliance: Indicates whether the company is in compliance with Global Reporting Initiative (GRI) criteria.

Global Reporting Initiatives Checked: Indicates whether the company's application level was checked by the Global Reporting Initiative (GRI).

Source: Bloomberg, 2016