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Extending the Boundaries of Supply Chain Transparency: Supplier Monitoring Activity Disclosure, Consumer Evaluations, and Brand Equity

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Extending the Boundaries of Supply Chain Transparency:
Supplier Monitoring Activity Disclosure, Consumer Evaluations, and Brand Equity

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Business Administration

by

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ABSTRACT

Socially responsible policy makers and consumers are pressuring firms to make their supply chains more transparent by disclosing information about their supplier monitoring activities (SMA). Yet, high monitoring costs and the complexity of supply chains pose challenges for firms to effectively monitor their extended supply chain, including both first-tier and lower-tier suppliers. In order to comprehensively evaluate the net benefit from SMA, it is therefore critical to consider potential effects on drivers of additional revenues that may accrue from the disclosure of SMA to consumers.

Prior research on SMA has examined the associated cost, risk, and supplier relational implications on the focal firm. I examine the effect of supply chain transparency by means of a firm's SMA disclosure on consumer evaluations through a series of experiments and sentiment analysis of social media data. Further, I study the effect of SMA disclosures on a firm's brand equity via content analysis of corporate social responsibility (CSR) reports. Specifically, I investigate the effects of (1) mere disclosure of SMA, (2) the breadth of SMA, the depth of SMA, and the specific mechanism used to monitor lower-tier suppliers, and (3) the interactions between issue involvement, SMA disclosure, and SMA characteristics on consumer evaluations.

The results reveal that (1) the disclosure of SMA information improves individual-level consumer evaluations, consumer sentiment, and organizational-level brand equity; (2) SMA characteristics including breadth, depth, and monitoring mechanism each have effects on consumer evaluations; and (3) consumers' CSR involvement plays an important role in strengthening the relationship between firms' SMA disclosures and evaluations.

This work makes several important contributions to several literature streams including the CSR literature, the supply chain transparency literature, and the sustainable supplier

management literature. This research also provides motivation and guidance for practitioners that engage in or are considering SMA by highlighting SMA disclosure as a means for firms to boost consumer evaluations. Further, for firms that strive to achieve supply chain transparency through SMA disclosures, results show that not only is it critical to understand what to disclose, but also to whom to disclose.

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1. INTRODUCTION

Supply chain transparency is becoming increasingly important to companies and consumers. For instance, the California Transparency in Supply Chains Act of 2012 requires all large companies that operate in California to disclose supplier information and their efforts to eradicate illegal labor practices. Consumers also pressure firms for greater supply chain transparency (Bell et al., 2016; Schnackenberg and Tomlinson, 2016; Castillo et al., 2018). In part, these pressures have driven large retailers to pioneer technologies such as RFID so as to better track products throughout their supply chain (New, 2010). The resulting supply chain visibility enables firms to identify and monitor both their first-tier and lower-tier suppliers. Yet, firms are often “lethargic in monitoring” (Wilhelm et al., 2016a p. 42) due to high monitoring costs and the complexity of their extended supply chains. The existing literature has not sufficiently explored the benefits of SMA that may justify these costs. In particular, the effect of SMA on consumer evaluations is not yet well understood. In an effort to address this gap, I study how firms’ communications about their SMA—and the specific nature of the information disclosed in such communications—affect consumers’ evaluations and, ultimately, the firms’ brand equity.

Supply chain transparency is different from both visibility (Busse et al., 2017; Somapa et al., 2018) and traceability (Bell et al., 2016). While visibility and traceability emphasize firms’ exchange of primarily operational information with their supply chain partners, transparency refers to firms’ voluntary information disclosure to external stakeholders (Bell et al., 2016). The benefits of supply chain visibility and traceability have been well-documented in prior literature (Stalk et al., 1992; Waller et al., 1999; Aviv, 2001; Aviv, 2002; Cheung and Lee, 2002). Yet, with a few exploratory exceptions (Doorey, 2011; Egels-Zanden and Lindholm, 2015), the

benefits of supply chain transparency remain understudied. In a similar vein, the supplier management literature has examined the benefits of sustainable supplier management practices (Carter, 2000; Prahinski and Benton, 2004; Blome et al., 2014; Bregman et al., 2015; Huq et al., 2016). Nevertheless, the extant body of research has neither considered the effect of disclosure of these practices on consumer evaluations nor differentiated between first- and lower-tier SMA. To fill this void, my research seeks to understand the effects of firms' mere disclosure about their SMA, the depth of SMA (extending to lower-tier suppliers), the scope of SMA (including environmental and/or social dimensions), and the monitoring mechanisms for lower-tier suppliers on consumer evaluations. In addition, I examine how these effects vary as a function of consumers' issue involvement. Thus, my research aims to provide answers to the following three research questions:

- 1. Do firms' communications about their supplier monitoring activities (SMA) affect consumer evaluations and firms' brand equity?*
- 2. Do consumer evaluations differ based on the characteristics of firms' SMA disclosures (depth, scope and mechanism)?*
- 3. What role does issue involvement play regarding the effect of SMA and consumer evaluations?*

To answer these questions, I employ signaling theory and elaboration likelihood model (ELM) as the overarching theoretical anchors and adopt a mixed-method approach, including both behavioral experiments and archival data analysis.

The contributions of the present study are threefold. First, I extend the boundary of the transparency literature by focusing on consumers and exploring the benefits of firms' transparency about SMA. I provide evidence of a positive association between firms' SMA disclosures and firms' brand equity. Second, my research contributes to the supplier management literature by specifically examining the effects of lower-tier supplier monitoring. Broadening the scope beyond the first-tier suppliers and exploring the top line benefits of SMA, the current

research adds to our understanding of the performance implications of sustainable supplier management. Finally, the present study provides motivation, and maybe more importantly, guidance for practitioners to further engage in SMA as the results provide evidence that communications about firms' SMA can positively influence their brand equity.

2. LITERATURE REVIEW

2.1. Corporate Social Responsibility (CSR) and Firm Performance

Corporate social responsibility (CSR) has long been a strategic and operational concern for contemporary firms (Albuquerque et al., 2018). According to the World Business Council for Sustainable Development (WBCSD), CSR is defined as the “the commitment of a business to contribute to sustainable economic development, working with employees, their families, the local community and society at large to improve their quality of life” (WBCSD, 2004).

The relationship between CSR and firms' performance has received considerable attention in the literature. Regarding the performance implications of CSR, prior literature provides mixed evidence. In early literature, scholars view CSR as a firm's “donation” to stakeholders to reduce firm-level profits (Friedman, 2005; Friedman, 2009) or a result of conflicts between stakeholders and managers (Jensen and Meckling, 1976). Thus, scholars argue that CSR practices result in focal firms' sub-optimal operation from a cost perspective (Leenders and Blenkhorn, 1988; Linton et al., 2007). For instance, researchers argue that firms' CSR engagement impedes their financial performance due to the associated costs, compliance barriers, and partners' opportunistic behaviors (Min and Galle, 1997; Cox et al., 1999; Zhu and Sarkis, 2004). Others, however, provide evidence for the potential value of firms' CSR engagements (Zhu and Sarkis, 2004; Golicic and Smith, 2013). For instance, scholars argue that CSR can be used as a product differentiation strategy that allows firms to maximize profits

(Navarro, 1988; Bagnoli and Watts, 2003; Siegel and Vitaliano, 2007; Albuquerque et al., 2018). Luo and Bhattacharya (2006, 2009) show a positive relationship between firms' CSR engagements and consumer loyalty, resulting in an increase in pricing power. Similarly, multiple studies provide evidence that focal firms can increase sales or raise prices if their products have CSR features (Elfenbein and McManus, 2010; Elfenbein et al., 2012; Ailawadi et al., 2014; Hilger et al., 2018). Moreover, studies show that focal firms' CSR engagements can motivate innovations, improve operations, and provide opportunities to achieve competitive advantages (Porter and van der Linde, 1995; Golicic and Smith, 2013). In a meta-analysis that examines 33 independent studies, Golicic and Smith (2013) identify positive associations between CSR practices and multiple performance indicators, including environmental, market-based, and operational performance. Similarly, Zhu and Sarkis (2004) investigate and establish positive associations between CSR engagements and focal firms' environmental and economic performance.

In addition, recent empirical studies document a negative relationship between firms' CSR engagements and firm risk (Godfrey et al., 2009; Flammer 2013; Hofmann et al., 2014; Kang et al., 2016; Albuquerque et al., 2018). Specifically, prior literature provides evidence that CSR decreases firm-level systematic risk while increasing firm value (Albuquerque et al., 2018). Scholars show that engaging in CSR practices is an effective way to manage supply chains' sustainability risks (i.e., social or ecological issues) that result from focal firms' operations. In addition, evidence suggests that CSR engagement provides an insurance-like mechanism (Godfrey et al., 2009; Flammer, 2013; Kang et al., 2016), which refers to the goodwill focal firms obtain from their CSR practices that consequently mitigate the negative effects of future adverse events. Godfrey et al. (2009) show that CSR engagement signals focal firms' altruistic

orientation, serves as insurance against the effects of negative events, and more importantly, positively affects stakeholder value. Minor and Morgan (2011) find that firms' CSR engagement protects focal firms from losing reputation when adverse events occur. Another study conducted by Flammer (2013) offers more insights about the insurance-like mechanism that CSR engagement provides. Although it supports such a mechanism, the study also reveals that the marginal benefit of CSR decreases with increased stakeholder pressure.

As reflected by the definition, engaging CSR involves the adoption of various practices that may involve, but are not limited to, the environment, community, human rights, and employee treatment (Servaes and Tamayo, 2013). Based on the literature, these activities vary in foci and resource requirements, and, thus, influence focal firms' performance differently (Godfrey et al., 2009; Pullman et al., 2009). For instance, Pullman et al.'s (2009) empirical study of the U.S. food industry compares the effects of social and environmental sustainability practices on firms' performance. Although environmental performance directly and significantly influences quality performance, it does not significantly affect firms' cost performance. Also, firms' social CSR practices were found to affect quality performance, but not cost performance. Along a similar vein, Godfrey et al. (2009) compare the performance implications of institutional CSR activities (i.e., CSR activities that target firms' secondary stakeholders or society) and technical CSR activities (i.e., CSR activities that target firms' trading partners). The authors find that financial benefits result from institutional CSR activities, whereas technical CSR activities did not produce benefits.

However, among the literature that explores the performance implications of CSR, most view CSR as a unified variable that captures firms' overall CSR performance (Godfrey et al., 2009; Servaes and Tamayo, 2013; Albuquerque et al., 2018), or consider it based on a broad

dimension (i.e., environmental or social) (Pullman et al., 2009; Elfenbein and McManus, 2010; Elfenbein et al., 2012; Flammer, 2013; Hilger et al., 2018). Although prior literature has provided evidence for the positive relation between CSR engagement and firms' performance, there is limited understanding of the effect of one specific CSR activity. The present study aims to address this gap by focusing on focal firms' supplier monitoring activity (SMA) and investigating its effect on firms' performance.

2.2. Sustainable Supply Chain Management (SSCM) and Supply Chain Transparency

For most contemporary firms, sustainability concerns shape not only their own business processes and decisions but also the operational processes across their entire supply chains (Zhu and Sarkis, 2004; Vachon and Klassen, 2006; Linton et al., 2007; Srivastava, 2007; Wu and Pagell, 2011). Carter and Rogers (2008) defined sustainable supply chain management (SSCM) as “the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its supply chains” (p. 368). As the boundary of the supply chain extends further, firms start to incorporate SSCM to a broader extent and integrate issues that are beyond the core supply chain management functions (Linton et al., 2007; Golicic and Smith, 2013).

In the framework defined by Carter and Rogers (2008), transparency is included as one of the four supporting facets of SSCM. Supply chain transparency is defined as “the information communicated by a company to its stakeholders (consumers, shareholders, suppliers, customers, governments, and agencies) regarding the sustainability (health, safety, ethics, etc.) of the supply chain products, materials, supply systems (manufacturing, warehousing, transportation, etc.), and services” (Bell et al., 2016, p.4). Driven by requests from external stakeholders (Hart, 1995), the

rapid speed of communication (Elkington, 1998), and the globalization of supply chains (Friedman, 2005), transparency has become the means for focal firms to communicate, engage, and interact with external stakeholders toward continuous improvements in their SSCM engagements (Rivera-Camino, 2007; Carter and Rogers, 2008).

Supply chain transparency is different from supply chain visibility (i.e., the ability of firms to see across their supply chains) and traceability (i.e., firms' ability to track goods across their supply chain) in that it shifts the focus from managers to external stakeholders (Morgan et al., 2018). Hence, to achieve supply chain transparency, firms should consider how to disclose their proactively engaged sustainable supply chain practices to their external stakeholders. Through such disclosure, firms can imply corporate integrity, boost stakeholder trust, and reduce product- and performance-related uncertainty (Bell et al., 2016; Schnackenberg and Tomlinson, 2016; Castillo et al., 2018).

Researchers from various areas have investigated the effect of disclosing different types of information, such as product (Howlett et al., 2009), financial (Bloomfield and O'Hara, 1999; Flood et al., 1999; Jordan et al., 2000), operational (Waller et al., 1999; Cheung and Lee, 2002; Cheung et al., 2010), and leadership information (Walumbwa et al., 2008). Their findings indicate that the effects of information disclosure are highly contingent on the type of information and the associated regulation. For instance, Cheung et al. (2010) explored the association between company transparency and firms' valuation and found a positive and significant relationship. Interestingly, this positive effect only holds when firms disclosed their information voluntarily, indicating that stakeholders might react more positively toward firms that proactively seek transparency.

In the field of supply chain management, prior literature in transparency mostly focuses on operational information disclosures to supply chain partners (Stalk et al., 1992; Waller et al., 1999; Aviv, 2001, 2002; Cheung and Lee, 2002; Dejonckheere et al., 2004). One common finding is that disclosing operational information positively affects firm performance. For instance, Aviv (2001, 2002) showed that sharing forecast information between suppliers and retailers can produce cost benefits across the supply chain. In the context of inventory disclosures, researchers found that information disclosures can result in improved operational performance (Dejonckheere et al., 2004; Waller et al., 1999) and lower costs (Cheung and Lee, 2002). According to the literature, this positive association can have two explanations. First, to achieve supply chain transparency, focal firms must exert more efforts in monitoring and identifying incidents along their supply chains, resulting in more knowledgeable firms. Thus, the value of transparency in the supply chain resides in both the short-term (e.g., increased reputation) and long-term (e.g., industry-wide collaboration) (Doorey, 2011). Second, supply chain information disclosures can reduce information asymmetry and increase trust among supply chain partners, which further promotes management accountability and decreases monitoring costs (Barratt and Oke, 2007; Cheung et al., 2010; Doorey, 2011; Schnackenberg and Tomlinson, 2016).

Although important strides have been made in understanding how transparency can be achieved by and benefit supply chain partners, little is known about the effect of supply chain transparency on consumers as key stakeholders when sustainability-related information is disclosed (Bell et al., 2016). Given the important role consumers play in determining focal firms' performance (Zinn and Liu, 2001; Peinkofer et al., 2015; Ta et al., 2015), it is critical to extend the boundaries of supply chain transparency by examining the effect of non-operational

information disclosures and including external stakeholders as key information recipients.

Therefore, this work aims to examine how firms' sustainability-related information disclosures influence end consumers as firms' critical stakeholders.

2.3. Sustainable Multi-Tier Supplier Management

According to Carter (2000), managers did not previously consider their suppliers' environmental and social issues as focal firms' unethical behaviors. However, firms are beginning to integrate suppliers' sustainable practices into their operations (Linton et al., 2007; Jira and Toffel, 2013; Huq et al., 2016; Jacobs and Singhal, 2017; Villena and Gioia, 2018). The most important motivation for such change comes from stakeholder pressures. For instance, studies show that consumers hold focal firms responsible for the unethical and unsustainable behaviors of their upstream suppliers. Such attribution can lead to significant adverse effects, such as negative emotional reactions and boycotting behavior (Hartmann and Moeller, 2014). Similarly, other evidence shows that consumers make ethical judgments based on their evaluations of focal firms' sourcing practices, which significantly affect their intention to consume focal firms' products (Bregman et al., 2015).

Moreover, as firms' supply chains become longer and more complex, there are increasing pressures from stakeholders to extend sustainable practices further along the supply chain by including both first-tier and lower-tier suppliers (i.e., suppliers located in the second tier or further upstream) (Bregman et al., 2015; Wilhelm et al., 2016a, b; Villena and Gioia, 2018). Nevertheless, although monitoring first-tier suppliers is relatively straightforward, the majority of focal firms find monitoring lower-tier suppliers to be extremely challenging (Choi and Hong, 2002). According to the literature, there are three reasons that may account for such challenges. First, as focal firms do not have access to adequate information from lower-tier suppliers, they

can only exert limited control for SSCM compliance (Plambeck and Denend, 2011; Koh et al., 2012). Second, lower-tier suppliers encounter different institutional pressures compared with the focal firms because most are small in size (Tachizawa and Wong, 2014; Whilhelm et al., 2016a), relatively unfamiliar to the public (Lee et al., 2012), and are located in regions subject to less rigorous sustainability regulations (Esty and Winston, 2009). Lastly, unlike the stable relationships between focal firms and their first-tier suppliers, the relationships between focal firms and their lower-tier suppliers are less stable and lack long-term commitments (Tachizawa and Wong, 2014).

Incorporating SSCM practices into suppliers management can be achieved via various means (Walton et al., 1998; Thornton et al., 2013; Blome et al., 2014; Busse, 2016), and numerous studies have identified benefits for such incorporation (Wu and Pagell, 2011; Jira and Toffel, 2013; Huq et al., 2016; Jacob and Singhal, 2017). For example, Thornton et al. (2013) investigate whether selecting socially responsible suppliers is associated with a focal firm's performance. Results indicate that although this relationship varies across countries, in general, there is a positive association between selecting socially responsible suppliers and the focal firm's financial performance. Similarly, Blome et al. (2014) find that by engaging in green procurement and green supplier development activities, a focal firm's suppliers will perform better. Busse (2016) argues for a positive relationship between suppliers' sustainable conditions and focal firms' economic performance due to reduced risks and collaborative benefits. Most studies, however, focus on focal firms' first-tier suppliers and do not sufficiently consider the critical role of lower-tier suppliers (Villena and Gioia, 2018).

Some important progress has been made to understand the effect of extending SSCM practices to lower-tier suppliers. For instance, Wilhelm et al. (2016a) studied focal firms'

sustainability standards compliance in three-tier supply chains and suggested that tier-one suppliers can play a double-agency role in promoting and imposing focal firms' requirements on lower-tier suppliers. Mena et al. (2013) propose an approach to managing a three-tier supply chain. According to the authors, to ensure the compliance of sustainability standards, focal firms should engage not only their first-tier suppliers but also lower-tier suppliers. In a comprehensive literature review conducted by Tachizawa and Wong (2014), the authors proposed four lower-tier supplier monitoring mechanisms: direct, indirect, through a third-party organization, and don't bother. Through case studies and in-depth interviews, Meinschmidt et al. (2018) concluded that focal firms' lower-tier sustainability management strategies are based on the strength of contextual factors (e.g., stakeholder salience, structural supply network complexity, and product and industry salience). Through a case study approach, Wilhelm et al. (2016b) identified three factors (i.e., supply chain complexity, the sustainability management capabilities of the first-tier suppliers, and the type of sustainability in focus) that determine focal firms' engagements with lower-tier suppliers. Via a field study, Grimm et al. (2014) compiled a set of critical factors that influence lower-tier suppliers' sustainability standard compliance, which may be related to the (1) focal firm, (2) relationships, (3) supply chain, or (4) context. By conducting in-depth interviews, Brockhaus et al. (2013) develop a typology for focal firms to implement sustainability initiatives within their supply chain. Villena and Gioia (2018) adopted a practice-driven framework that guides focal firms to better manage their sustainable supply chain networks. The authors found that lower-tier suppliers, who are the least monitored and regulated, pose the greatest sustainability risk and, thus, have a greater need to adopt sustainability standards. While prior studies establish the importance of including lower-tier suppliers in focal firms' SSCM practices, there is little empirical research that (1) examines the benefits of

engaging lower-tier suppliers in SSCM on drivers of firm revenues, or (2) compares differences in benefits among various lower-tier supplier management strategies.

3. HYPOTHESIS DEVELOPMENT

In this section, I develop research hypotheses regarding the effects of firms' SMA communications on consumer evaluations. Hypothesis 1 investigates the effect of mere SMA disclosure—whether or not any firm discloses any information about its SMA—on consumer evaluations. Hypotheses 2 and 3 explore how consumer evaluations differ based on the characteristics of firms' SMA disclosures (breadth, depth and mechanism). Hypotheses 4 and 5, in turn, examine the role that individuals' issue involvement plays in shaping the relationship between SMA disclosures and consumer evaluations.

3.1. SMA Mere Disclosure

Firms' SMA disclosures are expected to impact consumers' perceptions and evaluations. According to signaling theory such disclosures serve as signals that can reduce the information asymmetry between insiders (e.g., firms) and outsiders (e.g., consumers) (Spence, 1978; Spence, 2002; Connelly et al., 2011). Consumers may then use this information to make inferences and generalizations which can subsequently influence their evaluations. For instance, prior research has associated the disclosure of information regarding firms' sustainable initiatives with greater product quality perceptions and purchase intentions (Borin et al., 2011). Similarly, firms signal their adherence to social laws and values via a heterogeneous board of directors (Miller and del Carmen Triana, 2009). In the realm of supply chain transparency, disclosing information on SMA can signal a firm's socially responsible behaviors and intentions. Though signal interpretation varies among different receivers, the mere fact of sending out signals via SMA disclosures is expected to have a positive effect on consumers' perceptions.

Activation theory provides an alternative argument for the positive association between SMA disclosures and consumer evaluations. In cognitive psychology, human memory is viewed as a network where information resides in linked nodes (Collins and Loftus, 1975; Janakiraman et al., 2009; Borah and Tellis, 2016). The central tenet of activation theory is that exposure to specific information will activate particular nodes (Collins and Loftus, 1975) as well as linked concepts within individuals' memory networks (Nedungadi, 1990; Hahn et al., 1992). Consistent with activation theory (e.g., Collins and Loftus, 1975; Andrew et al., 1998), I argue that SMA disclosure triggers a priming mechanism whereby individuals are sensitized to the concept of supplier monitoring and associate the same with positive concepts, resulting in a positive change in consumer evaluations.

Consistent with activation theory, SMA disclosures are likely to result in positive consumer evaluations by activating two different positive perceptions or concepts (Brown and Dacin, 1997; Creyer, 1997; Mohr and Webb, 2005; Sen and Bhattacharya, 2001). First, SMA disclosures can serve as signals and activate positive perceptions about superior product quality within consumers' memory networks (Loureiro and McCluskey, 2000; Loureiro et al., 2001; Sammer and Wüstenhagen, 2006; Grankvist and Biel, 2007a). According to prior literature, consumers will perceive the focal firm's products to have higher product quality credence after being exposed to firms' sustainability-related communications (Brach et al., 2018). For example, in the household appliance industry, prior literature provides evidence that consumers perceive eco-labelled products to be more energy efficient, and thus are more likely to purchase such products (Sammer and Wüstenhagen, 2006). Similarly, in the food service industry, when firms communicate their sustainable practices (e.g., pesticides usage), consumers consider those products to be safer and healthier, and thus have greater purchase intention (Loureiro and

McCluskey, 2000; Grankvist and Biel, 2007a). Likewise, prior literature provides evidence that while environmental concerns are an important reason for continuously engaging in eco-labelled food purchases, it is the belief that eco-labelled foods have better taste that initiates the purchase (Grankvist and Biel, 2007b). Hence, previous literature provides strong support for the positive association between firms' sustainability-related communications and superior product quality perceptions. I argue that such a positive relationship also exists when SMA information is disclosed.

Through SMA, the focal firm can develop collaborative relationships (Walton et al., 1998; Thornton et al., 2013; Blome et al., 2014) and create shared values with its suppliers, which will further result in commitment and trust in the B2B relational exchange (Morgan and Hunt, 1994; Lancaster and Lages, 2006). Such trust and commitment, in turn, will positively influence suppliers' customer service and product quality (Lancaster and Lages, 2006). In addition, the focal firm can ensure more effective implementation and diffusion of its product quality standards via SMA (Corbett and Kirsch, 2001; Delmas, 2002; Corbett, 2006). For instance, firms such as IBM and Bristol-Myers Squibb highly encourage their suppliers to obtain quality certifications (e.g., ISO 14000) (Corbett and Kirsch, 2001; Delmas, 2002). Consequently, the suppliers are motivated to improve their product quality in order to obtain the certification (Delmas, 2002). Moreover, through SMA, a focal firm can monitor and verify its suppliers' compliance with quality-related requirements (Ayuso et al., 2013), focus on suppliers with high compliance risks and work on mitigating those risks. Therefore, I argue that a focal firm's SMA will activate consumers' beliefs that the focal firm and its suppliers provide higher quality products and will, therefore, result in positive consumer evaluations.

Second, since the majority of consumers have expressed concerns about environmental (Kalamas et al., 2014) and social issues (Musgrove, 2006; Barboza, 2010; Power and Devnath, 2012), disclosure of a focal firm's SMA will activate positive concepts such as "moral" and "ethical" within their memory networks (Bregman et al., 2015). Such concepts will lead consumers to perceive the focal firm as "ethical" and thus are more likely to buy from and remain loyal to the focal firm (Brown and Dacin, 1997; Hassan et al., 2013; Bregman et al., 2015). For instance, Brown and Dacin (1997) show that knowing a focal firm engages in charity donations and community service will enhance consumers' perceived trustworthiness and liking of the firm. I argue that SMA disclosure will trigger similar perceptions since issues such as unfair employee treatment (Musgrove, 2006), worker suicides (Barboza, 2010) and unsafe working conditions (Power and Devnath, 2012) have drawn consumers' attention to the importance of SMA. Indeed, consumers in the UK spent more than \$287 million in ethical clothing in 2009 (Ethical Consumer Research Association, 2010) and are intentionally looking for labels that provide country of origin as well as information on working conditions (Hassan et al., 2013). With the increased attention, consumers are likely to identify the focal firm as "ethical," "social responsible" or "trustworthy" when exposed to SMA information. According to activation theory, these positive concepts, activated by SMA disclosure, will further spread within their memory networks. While the strength and time period of the processes differ among individuals (Collins and Loftus, 1975), a positive evaluation will be the common consequence of the SMA exposures.

In summary, consistent with arguments from signaling theory and activation theory, I hypothesize that firms' disclosures of SMA-related information will positively influence consumer evaluations.

Hypothesis 1: *Firms' SMA disclosures will positively affect consumer evaluations*

3.2. SMA Disclosure Characteristics

3.2.1. Breadth and depth.

I further hypothesize that SMA characteristics, which capture the breadth and depth of SMA, will also affect people's interpretations of SMA signals and result in different perceived signaling costs. *SMA breadth* pertains to firms' foci of their SMA efforts in the environmental dimension, the social dimension, or both. *SMA depth* refers to whether focal firms limit their SMA to only first-tier suppliers or extend these monitoring activities to their lower-tier suppliers located further upstream in the supply chain (Bregman et al., 2015; Wilhelm et al., 2016a, b).

According to signaling theory, signals differ in terms of their characteristics and convey different signaling costs, which will consequently affect consumers' interpretation and valuation of such signals (Smith and Bliege Bird, 2005; Connelly et al., 2011). These signaling costs refer to "the transaction costs associated with implementing a signal" (Connelly et al., 2011 p. 45). The concept of signaling costs is crucial to signaling theory which has also been referred to as the "theory of costly signaling" (Zahavi, 1975; Grafen, 1990; Johnstone, 1997; Smith and Bliege Bird, 2005). While sending signals might be costly, such signals can indicate that signalers are in a better position than others to absorb the associated costs (Bearden and Shimp, 1982; Milgrom and Roberts, 1986; Boulding and Kirmani, 1993; Connelly et al., 2011). For instance, while manufacturers can use ISO 9000 certifications to signal superior product quality, the associated signaling cost is high, which makes cheating—or false signaling—difficult. Meanwhile, obtaining an ISO 9000 certification is relatively less costly for high-quality manufacturers when compared with low-quality manufacturers because the latter will need to implement significant

operational changes to meet the certification requirements (Connelly et al., 2011). Therefore, from the signal receivers' perspective, costlier signals will usually be considered to be more credible (Milgrom and Roberts, 1986; Lee, 2001) and to provide more honest information (Zahavi 1975; Grafen 1990; Johnstone 1997; Smith and Bliege Bird, 2005). Hence, receivers will tend to generate more positive evaluations upon observing costlier signals (Gunther McGrath and Nerkar, 2004; Busenitz et al., 2005; Cohen and Dean, 2005).

In the realm of SMA disclosures, signals and associated costs differ depending on the breadth of a firm's SMA. In this research, SMA breadth refers to the extent to which firms' monitoring activities cover either suppliers' environmental or (/and) social activities and impacts. While both environmental and social dimensions are important components of sustainability (Elkington, 1998; Norman and MacDonald, 2004; Savitz and Weber, 2006), their foci and monitoring/reporting requirements differ significantly (Elkington, 1994; McKenzie, 2004; Pullman et al., 2009; Milne and Gray, 2013).

A firm that focuses on environmental SMA surveys suppliers' activities "relating to the natural environment, environmental protection and resource use" (Jenkins and Yakovleva, 2006 p. 273) and strive to reduce their suppliers' environmental impacts (e.g., reduce energy consumption, waste generation and land use) (Slaper and Hall, 2011). For example, Cisco assists its suppliers in their energy conservation efforts by piloting an Internet of Things (IoT) factory-of-the-future solution, which uses sensors to measure energy consumption of systems and equipment. In addition, Cisco collaborates with its suppliers to reduce greenhouse gas emission by building a shared database, creating and executing a supply chain emissions reduction plan (Cisco 2016 CSR report).

A firm that focuses on social SMA, on the other hand, strives to ensure that suppliers “provide equitable opportunities, encourage diversity, promote connectedness within and outside the community, ensure quality of life and provide democratic processes along with open and accountable governance (Pullman et al., 2009 p. 41-42).” The goal, thus, is to improve employee diversity, equity, health and well-being (Savitz and Weber, 2006; Slaper and Hall, 2013). Hewlett-Packard, for example collaborates with non-profit organizations and as part of an industry-wide coalition to protect factory workers, combat forced labor, and promote suppliers’ health and safety by establishing the labor KPI and capability building programs (Hewlett-Packard 2016 CSR report).

Given the different foci and requirements of environmental and social SMA, I argue that signaling costs will be higher when SMA efforts are broader, covering both the environmental and social dimensions, than when SMA is limited to a single dimension only. Engaging in either environmental or social SMA requires a large amount of financial and human resource commitments. While social and environmental dimensions are complementary to achieving sustainability (Bansal, 2005), they are not integrated and are considered as separate issues (Adizes and Weston, 1973; Davis, 1973; Alexander and Buchholz, 1978; Montiel, 2008). Likewise, environmental and social SMA are dissimilar because they require the focal firm to interact with different organizations, understand different regulations (Delmas and Montiel, 2007; Sarkis et al., 2010), cover different aspects of supplier operations, and thus necessitate expertise in distinct domains. For instance, a common environmental SMA practice is to foster the implementation of ISO 14001 standards (Balzarova and Castka, 2008; Sarkis et al., 2010) and focus on minimizing suppliers’ negative environmental impacts throughout product design, manufacturing, and administrative routines (Klassen and McLaughlin, 1996; Montiel, 2008). In

terms of social SMA, firms focus on eradicating issues such as slavery and human trafficking (Harris, 2015) and monitor suppliers' community and labor relations, as well as diversity issues (Graves and Waddock, 1994; Waddock and Graves, 1997; Ruf et al., 1998). Hence, engaging in both environmental and social SMA requires broader skill sets, greater investments in a more varied set of distinct SMA activities as compared to instances where SMA is limited to either the environmental or social domain only.

Given the differences in commitments and requirements between environmental and social SMA, consumers will perceive signaling costs to be greater when firms engage in both environmental and social SMA. Such signaling cost perceptions will further affect consumers' signal interpretation. That is, consumers will generate more positive evaluations toward those firms whose SMA signals suggest higher signaling costs (Ndofor and Levitas, 2004; Smith and Bliege Bird, 2005).

Hypothesis 2a: *Monitoring suppliers in both environmental and social dimensions, i.e., greater SMA breadth, will have stronger positive effects on consumer evaluations than monitoring suppliers in a single dimension.*

Similarly, I propose that signaling costs and, ultimately, the effects on consumer evaluations will increase with SMA depth. As noted earlier, SMA depth refers to firms' communications regarding whether their monitoring activities are limited to first-tier suppliers or extend to lower-tier suppliers as well. Monitoring lower-tier suppliers is more challenging and generates additional costs: First, a focal firm exerts only limited control over lower-tier suppliers (Hartmann and Moeller, 2014) and, as a result, has limited access to information about these suppliers' activities. This issue is exacerbated by the fact that a focal firm may be indirectly linked with a large number of lower-tier suppliers that are geographically dispersed (Choi and Hong, 2002; Tachizawa and Wong, 2014). Second, lower-tier suppliers face comparatively low

institutional pressure because they tend to be smaller firms (Tachizawa and Wong, 2014; Wilhelm et al., 2016), relatively unknown to the public (Lee et al., 2012) and located in regions that are subjected to less rigorous regulations (Esty and Winston, 2006). Hence, lower-tier suppliers are less motivated to comply the relevant standards and implement sustainable practices. Lastly, unlike the relationships between a focal firm and its first-tier suppliers, the relationships with its lower-tier suppliers are less stable and are marked by a lack of long-term commitments (Tachizawa and Wong, 2014). These concerns are illustrated in Dell's 2016 CSR report: "expanding transparency of the sub-tiers of our supply chain is something we aspire to, but we face some challenges. Since we lack contractual leverage with sub-tier suppliers, we are limited in the kinds of social and environmental performance data we can obtain or share publicly. In some cases, we face competing demands from sub-tier suppliers' other customers or we lack visibility into their supply chains" (p.16).

Hence, when it comes to lower-tier SMA, focal firms have to expend additional efforts to build connections, maintain transparency, and check for compliance, resulting in much higher associated signaling costs (Roth, 2008; Awaysheh and Klassen, 2010; Hartmann and Moeller, 2014). Due to these higher signaling costs, the signal will be considered to be more credible. I therefore argue that when a focal firm's SMA involves both its first- and lower-tier suppliers as opposed to first-tier suppliers only, consumers will generate more positive evaluations of the firm.

Hypothesis 2b: *Monitoring both first- and lower-tier suppliers, i.e., greater SMA depth, will have stronger positive effects on consumer evaluations than monitoring only first-tier suppliers.*

3.2.2. Lower-tier supplier monitoring mechanism.

Firms adopt and report different mechanisms to monitor their lower-tier suppliers (Tachizawa and Wong, 2014). Firms may choose to directly monitor their lower-tier suppliers, they may do so indirectly—delegating the task of monitoring suppliers further upstream in the supply chain to their first-tier suppliers—or they may rely on third-party organizations to monitor, audit or certify lower-tier suppliers.

These approaches differ in terms of monitoring intensity and associated costs (Tachizawa and Wong, 2014). Monitoring lower-tier suppliers directly is typically associated with the highest monitoring cost. To monitor lower-tier suppliers, the focal firm has to first select its lower-tier suppliers (Choi and Hong, 2002) and then build direct connections with these firms, bypassing the first-tier suppliers (Mena et al., 2013). Effective monitoring then requires the firm to maintain these connections through frequent on-site visits and knowledge sharing (Crespin-Mazet and Dontenwill, 2012; Tachizawa and Wong, 2014).

Indirect monitoring, in turn, requires a focal firm to work with its first-tier suppliers and establish detailed sustainability-related standards (Grimm et al., 2011; Pilbeam et al., 2012) that can then be applied to lower-tier suppliers. Since the monitoring activities are delegated to first-tier suppliers, the focal firm only has to ensure the first-tier suppliers' cooperation and compliance through monetary or relational incentives (Whilhelm et al., 2016a). Hence, when compared with direct monitoring, indirect monitoring is lower in monitoring intensity and associated costs.

Compared to direct and indirect monitoring, working with a third-party organization to monitor a focal firm's lower-tier suppliers incurs lower monitoring costs and implies lower monitoring intensity (Crespin-Mazet and Dontenwill, 2012; Tachizawa and Wong, 2014;

Whilhelm et al., 2016a). Firms can work with various third-party organizations such as NGOs, third-party auditors, governments, and standard institutions to monitor suppliers (Peters et al., 2011; Prado, 2013). By working with a third-party organization, the focal firm can support the development of self-regulations or voluntary standards, and then promote the implementation of those standards with its lower-tier suppliers (Plambeck and Denend, 2011; Plambeck et al., 2012; Lee et al., 2012). Another benefit of working with third-party auditors is that the latter may benefit from economies of scale by virtue of monitoring greater numbers of suppliers for multiple clients (Crespin-Mazet and Dontenwill, 2012; Hannibal and Kauppi, 2018). However, working with a third-party organization to conduct lower-tier SMA may result in ineffective monitoring (Albersmeier et al., 2009; Huq, 2014; Hannibal and Kauppi, 2018). Prior research has provided evidence that hiring a third-party organization to conduct supply chain audits can result in “mock compliance, limited interest in assessing suppliers beyond tier one of the chain and poorly trained assessors” (Hannibal and Kauppi, 2018 p.3). Moreover, contrary to expectations, there is also evidence that third-party audits lack independent, consistent, and objective assessments (Huq, 2014). For instance, there were several food quality scandals (e.g., dioxin in animal feed and spoiled meat) in Germany even though third-party certification schemes were in place (Hannibal and Kauppi, 2018). Hence, hiring a third-party auditor is associated with the lowest monitoring costs as well as the lowest monitoring intensity.

Consistent with signaling theory, disclosing information about the different lower-tier supplier monitoring mechanisms will result in varying consumer evaluations due to the different associated signaling costs. Specifically, I propose that SMA disclosures referencing a focal firm’s direct monitoring of its lower-tier suppliers will yield the highest consumer evaluations since such disclosures are associated with the highest signaling costs and, consequently, the

highest perceived signal efficacy. In line with this argument, a focal firm that uses indirect monitoring will result in the second highest consumer evaluations, followed by a firm that outsources SMA to third-party organizations.

Hypothesis 3a: *Direct lower-tier supplier monitoring activities will have the strongest positive effects on consumer evaluations, followed by indirect lower-tier supplier monitoring and third-party organization monitoring.*

The third-party organization endorsement literature (Dean and Biswas, 2001; Dando and Swift 2003; Perego and Kolk, 2012) provides an alternative theoretical rationale for potentially differential effects of various lower-tier SMA mechanisms on consumer evaluations. While delegating lower-tier supplier monitoring activities to a third-party organization might be relatively inexpensive, such delegation can result in increased evaluations for three reasons (Dando and Swift 2003; Perego and Kolk, 2012): First, third-party organizations are often viewed by consumers as independent, nonprofit endorser who have access to various resources and, thus, provide more trustworthy results (Owen et al., 2000; Ball et al., 2000; Dean and Biswas, 2001; Dando and Swift 2003). Therefore, people might view the information from third-party organizations to be more convincing and credible (Ball et al., 2000; Perego and Kolk, 2012). Second, most people consider third-party organizations to have only remote relationships with focal firms (Dean and Biswas, 2001). Hence, third-party organizations are less likely to be manipulated by the focal firms through direct compensations (Dean and Biswas, 2001). Lastly, people may interpret signaling costs associated with third-party SMA differently: Instead of focusing on the lower cost of third-party lower-tier SMA, individuals tend to focus more on the tremendous costs—in terms of damage and credibility loss—if the signals are proven false (Boulding and Kirmani, 1993; Bearden and Shimp, 1982; Dean and Biswas, 2001). According to prior literature, hiring a third-party organization to monitor lower-tier suppliers will provide a

“bonding” component to focal firm’s signals, and result in higher signal credibility (Ippolito, 1990). A cost will be incurred, for both the third-party auditor as well as the focal firm, if the signal is found to be false (Boulding and Kirmani, 1993; Dean and Biswas, 2001). For instance, if a company that delegates its lower-tier SMA to a third-party organization has been identified as having forced labor issues, both the firm and the third-party organization will suffer from a considerable loss of reputation. The loss of reputation will be destructive for the third-party organization since reputation is its most valuable asset (Dean and Biswas, 2001). While the direct cost of working with a third-party organization is relatively low, the loss of reputation will be significant costs to both the focal firm and the third-party organization if the conducted audits appear to be inconsistent or incorrect (Dean, 1999). Hence, consumers will expect third-party organizations to conduct more rigorous audits and objective reporting, perceive the signals sent by them to be more credible (Wakefield and Whitten, 2006; Doh et al., 2010), and more likely to be affected by those signal (Miller and Baseheart, 1969; Schulman and Worrall, 1970). From this perspective, third-party organization monitoring might result in the highest consumer evaluation in comparison to either direct or indirect lower-tier supplier monitoring mechanisms. Hence, I propose an alternative to Hypothesis 3a as follows:

Hypothesis 3b: *Third-party organization lower-tier monitoring will have the strongest positive effects on consumer evaluations.*

3.3. Issue involvement and SMA disclosure.

While the characteristics of SMA disclosures can influence consumer evaluations, individual factors such as issue involvement also play an important role. Defined as “the extent to which the attitudinal issue under consideration is of personal importance” (Petty and Cacioppo, 1979 p. 1915), issue involvement impacts individuals’ perceived information persuasion, which, in turn, influences “the forms and changes of their attitudes” (Griffith et

al., 2018 p.170). An attitude refers to “an evaluation of an object, person, behavior, or event on a scale reflecting some degree of good or bad (Banaji and Heiphetz, 2010; Thompson et al., 2000; Griffith et al., 2018 p. 170)” such as feelings of favor/disfavor, approval/disapproval, liking/disliking (Eagly and Chaiken, 1993).

Prior literature provides evidence that issue involvement will moderate the relationship between information provision and individuals’ attitude. Specifically, there is evidence that the relationship between information provision and evaluations will be further enhanced for highly-involved individuals (Petty et al., 1981; Kemp et al., 2007; Bates et al., 2009). Individuals with high involvement are more concerned about the specific issues and will be motivated to actively look for and even elicit relevant information (Cegala et al., 2007; Bates et al., 2009). Conversely, such information should have little or no effect on individuals with low issue involvement (Kemp et al., 2007). While prior studies have provided evidence for the interaction between information provision and issue involvement, most of them were conducted in non-sustainability contexts (Petty et al., 1981; Cegala et al., 2007; Kemp et al., 2007; Bates et al., 2009). For instance, Bates et al., (2009) investigate the relationship between nutrient information disclosures and consumer evaluations in a food consumption context and find that highly-involved consumers are more likely to be affected by the disclosed information than consumers with low involvement. Similarly, Kemp et al., (2007) provide evidence that consumers with low involvement are less likely to be affected by the disclosed carbohydrate information as compared with highly-involved consumers.

In the context of SMA communications, the present study builds on the environmental involvement literature (Rothschild, 1984; Cho, 2015) and focuses on individuals’ corporate social responsibility (CSR) involvement. CSR involvement is defined

as the degree of personal relevance and importance associated with the environment and society (Savitz and Weber, 2006). Consistent with prior literature, the present study argues that consumers' CSR involvement will influence perceived SMA information persuasion, and consequently affect consumers' attitudes and evaluations toward the focal firm.

Specifically, I argue that consumers who are more concerned about environmental and social issues (high CSR involvement), will proactively search for sustainability information. Hence, SMA disclosures will respond to a specific need and interest on the part of highly-involved individuals and will, therefore, have greater impact on their evaluations.

Meanwhile, consumers with low CSR involvement are less likely to engage in proactive sustainability-related information searching, and are less likely to be affected by SMA disclosures. Accordingly, I argue that the effect of firms' SMA disclosures on consumer evaluations will be moderated by individuals' CSR involvement.

Hypothesis 4: *The positive effects of SMA disclosure on consumer evaluations will be amplified for consumers with high CSR involvement levels.*

Issue involvement is also hypothesized to affect how the disclosure of the previously discussed SMA characteristics influences consumers' evaluations due to the different mental routes selected during information processing. Researchers have identified that issue involvement impacts individuals' information processing routines, thus resulting in different perceived information persuasion and individual evaluations; this is termed the Elaboration Likelihood Model (ELM) (Petty and Cacioppo, 1986, 2012; Brinol et al., 2015; Griffith et al., 2018). According to the ELM, individuals' attitude changes can be attributed to two routes of influence, the central and the peripheral routes, which differ from each other in the amount of thoughtful information processing (Petty et al., 1981; Petty and Cacioppo, 1986). When receiving relevant information, highly-involved individuals will process information via a

‘central-route.’ Following such a route, considerable cognitive resources will be allocated and individuals are able to think critically and scrutinize the merit and relevance of information before making informed judgments (Petty and Cacioppo, 1979; Claeys et al., 2016; Griffith et al., 2018). Hence, highly-involved individuals often form their evaluations based on the quality of the information they receive (Petty and Cacioppo, 1986; Angst and Agarwal, 2009). In contrast, individuals with low issue involvement usually follow a ‘peripheral route’ during information processing (Bhattacharjee and Sanford, 2006; Angst and Agarwal, 2009; Claeys et al., 2016; Griffith et al., 2018). People following such a route in information processing will not engage in diligent considerations and will expend less cognitive effort. Rather, they will base their evaluations heavily on superficial cues such as information sources, number of arguments, or affinity for the endorsers (Petty and Cacioppo, 1979; Lane et al., 2013; Munnukka et al., 2016). Given these different information processing routes, issue involvement interacts with received information in determining individuals’ perceptions (Lee, 2008; Chang et al., 2015). Prior studies have found that when individuals follow the central route, they are more likely to process the information systematically, resulting in individuals taking the received information more seriously (Celsi and Olson, 1988; Maheswaran and Chaiken, 1991; Quintero Johnson et al., 2013; Chang et al., 2015).

In the realm of SMA disclosure, highly-involved consumers, who follow the central route in processing the received SMA information, will be more attentive to the SMA signals and process the signals to a greater extent by allocating a large amount of the cognitive resources (Chang et al., 2015). Hence, with the devoted cognitive resources, highly-involved consumers are more likely to discern and identify the associated signaling costs and are more likely to be affected by signals with high perceived costs. Therefore, high issue involvement will amplify the

positive effects of SMA breadth, depth, and lower-tier supplier monitoring mechanism on evaluations. Hence, I propose Hypotheses 5a to 5d as follows:

Hypothesis 5: *The positive effects of SMA disclosure characteristics on consumer evaluations will be amplified for consumers with high levels of CSR involvement.*

Hypothesis 5a: Breadth: *The positive relationship between SMA breadth and consumer evaluations will be amplified for consumers with high levels of CSR involvement.*

Hypothesis 5b: Depth: *The positive relationship between SMA depth and consumer evaluations will be amplified for consumers with high levels of CSR involvement.*

Hypothesis 5c: Direct lower-tier supplier monitoring: *Direct lower-tier supplier monitoring activities will have the strongest positive effects on consumer evaluations, followed by indirect lower-tier supplier monitoring and third-party organization monitoring, and these differences will be more pronounced for individuals with high levels of CSR involvement.*

Hypothesis 5d: Third-party organization lower-tier supplier monitoring: *Third-party organization lower-tier supplier monitoring activities will have the strongest positive effects on consumer evaluations, and these differences will be more pronounced for individuals with high levels of CSR involvement.*

4. METHODOLOGY

A series of empirical studies at different levels were conducted in order to test the proposed hypotheses. First, through four vignette-based experiments I aim to understand how focal firm's SMA disclosures affect consumer evaluations at the individual level. These four experiments allow me to establish causality and internal validity between focal firm's communications about its SMA and consumer evaluations. Second, via two archival studies, I provide additional external validity and extend the findings to the aggregated consumer level and firm level. The first archival study explores how focal firm's SMA disclosures affect organizational level brand equity. Particularly, by focusing on two industries and five-year period, I carried out a structured content analysis on firms' CSR reports and statistically analyzed

the association between firms' SMA disclosures and their brand equity. Based on the content analysis results, the second archival study explore how focal firm's SMA disclosures affect aggregated consumer sentiment, which was measured by sentiment scores from tweets that were corresponding to the focal firm across a three-month period.

4.1. Experimental Study

I first examine the effects of firms' SMA and its characteristics disclosures on consumer evaluations through four vignette-based experiments. The four experimental studies investigate the effect of (1). SMA mere disclosure; (2). SMA breadth disclosure; (3). SMA depth disclosure; and (4). Lower-tier supplier monitoring mechanism disclosures on consumer evaluations, respectively. In addition, the experiments allow me to study how the individual's issue involvement influences the relationship between SMA disclosures and consumer evaluations.

4.1.1. Overview of experimental studies.

The present research aims to investigate the effects of supply chain transparency about firms' SMA on consumers' perception and intentions. To test the hypotheses, I conducted four scenario-based, role-playing (SBRP) experiments, with each focused on different SMA characteristics. The SBRP experiments allowed me to manipulate different SMA characteristics via scenarios. By comparing the effects across different scenarios, I can identify causality and establish internal validity (Donohue et al., 2018). Specifically, Study 1, a 2 (SMA mere disclosure: disclosed vs. non-disclosed) x 1 between-subject factorial, focuses on the effect of SMA mere disclosure; Study 2, a 2 (SMA environmental dimension disclosure: with vs. without) x 2 (SMA social dimension disclosure: with vs. without) between-subject factorial, explores the effect of disclosing SMA at varying breadth, and Study 3, a 2 (SMA depth disclosure: first-tier SMA only vs. first- and lower-tier SMA) x 1 between-subject factorial, examines the effect of

disclosing SMA at different depth. Lastly, Study 4, a 3 (Lower-tier SMA mechanism disclosure: direct monitoring vs. indirect monitoring vs. 3rd party organization monitoring) x 1 between-subject factorial, investigates the effect of lower-tier supplier monitoring mechanism on consumers' evaluation. The SMA manipulations used in each study were extracted language from actual firms' corporate social responsibility (CSR) reports.

In all four studies, I recruited participants from the Amazon Mechanical Turk (M-Turk) platform. As a popular online crowdsourced platform, the M-Turk has been widely used in various disciplines. Compared with traditional student participants, the M-Turk provides data with similar reliability and quality (Paolacci et al., 2010; Peer et al., 2014) while offering other advantages such as low costs, speedy data collection, and diverse popularity (Kees et al., 2017). Nevertheless, prior researchers cast doubt on the use of M-Turk, concerning about multiple issues (Chandler et al., 2015; Zhou and Fishbach, 2016; Goodman and Paolacci, 2017; Wessling et al., 2017). The current research adopted a series of approaches during data collection in order to address potential concerns regarding the use of M-Turk. Table 1.1 describes potential concerns and my approaches to minimize them. The final sample size included 195, 348, 185 and 238 M-Turk workers for Study 1, 2, 3 and 4 respectively. On average, each participant spent 9 minutes in the study and the payment was \$0.70. Table 1.2 provides study information and demographic information of participants across four studies.

Insert Table 1.1 and Table 1.2 here

Recent studies have identified some issues regarding non-incentivized randomized experiments. Specifically, critical concerns include the unwanted demand effect (Zizzo, 2010), failed randomization (Angrist and Pischke, 2008; Antonakis et al., 2010; Antonakis et al., 2014), and the non-consequential decision environment (Baumeister et al., 2007; Furr, 2009; Lonati et

al., 2018). While it is impossible to address these concerns completely, the present study aims to minimize potential biased effects via multiple approaches.

Firstly, the unwanted demand effect refers to “the changes in behavior by experimental subjects due to cues about what constitutes appropriate behavior (Zizzo, 2010 p.75).” Various factors such as the hierarchical relationships between experimenters and participants, the social desirability, obvious experimental purposes, and direct interactions between experimenters and participants can result in the unwanted demand effects (Lonati et al., 2018). This study minimizes the demand effect with the following approaches. First, the between-subject experimental design makes the purposes of the studies unclear to the participants. In all studies, each participant is randomly assigned to *one* of the multiple scenarios and will be blocked from accessing other studies once finish. Hence, participants will access the information only regarding the focal firm’s SMA once without being able to make any comparison across scenarios, resulting in difficulties to understand the purposes of the studies and to identify the obvious choices. Second, all studies were conducted online, such recruiting procedures minimize the direct interactions between experimenters and participants, reducing the possibility of the demand effect (Carney et al., 2010; Ranhill et al., 2015). Thus, in Study 1, which investigates the effect of SMA mere disclosure, a control group (i.e., non-disclosed group) that exposes participants to a baseline level of the manipulated variable is included. Participants in that group will no access to any SMA information. By including such a control group and comparing the control group with the manipulated group (i.e., disclosed group), the demand effect will hold constant (Lonati et al., 2018).

The second relevant concern is the failed randomization (Angrist and Pischke, 2008; Antonakis et al., 2010; Antonakis et al., 2014), which can be resulted from the session effect

(e.g., sessions are separated by treatments in the laboratory setting) or from small sample sizes (Lonati et al., 2018). During the online recruiting, instead of assigning participants to a specific scenario, the present study randomly assigns each participant to one of the multiple scenarios. Hence, every participant has an equal possibility to be assigned to any of the scenarios once entering the study. Such randomized processes allow me to minimize the potential session effect. In addition, to avoid biased results due to the small sample sizes, there are more than 50 observations per cell in every study. These moderately large sample sizes allow the present study to have sufficient and robust statistical power (Simmons et al., 2011, 2013; Lonati et al., 2018).

Lastly, the present study consists of four non-incentivized SBRP experiments, which rely on self-reported measures and do not elicit actual behaviors (Podsakoff and Organ, 1986; Donaldson and Grand-Vallone, 2002). While using non-incentivized vignette-based experiments might bias the results when measuring behaviors (Antonakis, 2017), it is appropriate to use when “the dependent variable of interest is an emotion or a perception (Lonati et al., 2018 p. 22).” The primary dependent variable in this study is consumer evaluation, which consists of a series of perception measures include attitude toward the firm and perceived brand equity. Hence, with the goal of understanding consumer perceptions, using non-incentivized self-reported measures is justified.

Before testing, we checked assumptions of linearity, independence (i.e., Durbin-Watson), and homoscedasticity (i.e., Levene Statistics) and found them to be satisfied. The tolerance and variance inflation factors (VIF) were well below the recommended threshold, indicating no multicollinearity (Hair, 2006). Assessment of the graphical plots supported the normal distribution of the residuals. Therefore, we had no concerns about the assumptions for regression. Lastly, Cronbach’s alpha for each measure exceeded the 0.7 cutoff point, indicating reliability.

4.1.2. Study 1: SMA mere disclosure.

Study 1 explores the effect of SMA mere disclosures on consumer evaluations. I designed a 2 (SMA mere disclosure: disclosed vs. non-disclosed) x 1 between-subject SBRP experiment for Study 1 (Rungtusanatham et al., 2011; Tokar et al., 2016). Participants were randomly assigned to one of the two scenarios: SMA information disclosure; no SMA information disclosure.

4.1.2.1. Procedures.

Participants at all scenarios were asked to imagine shopping for a computer and were presented with an online e-commerce webpage with the title of “*Feature brands.*” The e-commerce site depicted basic product information (i.e., brand name and logo, product images, product specification). The main manipulation was whether the SMA related information is presented. In the SMA information disclosure scenario, participants were provided information about the firm’s SMA with details under the section of *from the company*. The information presented was as follows, “*We hope to exert influence over the supply chain to lead our suppliers to comply with our code of conduct. Our supplier code of conduct sets forth our commitment to integrity and compliance within its global supply chain. We carefully monitor supplier environmental practices such as: Carbon footprint; Energy and water consumption; Waste recycling. Also, we carefully monitor supplier social practices such as: Diversity; Human rights protection; Community service engagement. We monitor processes and materials with our suppliers to make our products as sustainable as economically and technically possible.*” In the no SMA information disclosure group, no information was provided under the section *from the company*. See Table 1.3 for the language used in each stimulus and Appendix 1.B for an example of the stimulus (i.e., SMA information disclosure vs. no SMA information disclosure). After

seeing the webpage stimulus, participants were asked about their perceptions toward the firm, CSR involvements and demographic information.

Insert Table 1.3 here

4.1.2.2. Measures.

The primary independent variable in Study 1 was the SMA mere disclosure, a binary variable indicating whether SMA-related information was presented (0 = non-disclosed, 1 = disclosed). I also included CSR involvement as the moderator. The CSR involvement was adapted from Savitz and Weber (2006) and captured participants' involvement for both environmental (e.g., pollutants emitted; carbon footprint; recycling and reuse; water and energy use; product impacts) and social issues (e.g., health and safety record; community impact; human right and privacy; product responsibility; employee relationships). The dependent variables were two perceptions measures, including the attitude toward the firm (Burton et al., 1994), and the overall perceived brand equity (Yoo and Donthu, 2001). All constructs were measured using validated items from prior research and were measured on seven-point Likert scales. For each multi-item measure, means were calculated and used in each of the studies. See Appendix 1.A for detailed information for the measures.

4.1.2.3. Results.

4.1.2.3.1. Main effect.

Table 1.4 presents the descriptive statistics for each variable in Study 1. Hypothesis 1 argues that firms' SMA disclosures will lead to positive consumer evaluations. The one-way ANOVA results provide support for this hypothesis: SMA information disclosures group generates significantly higher attitude toward the firm ($M_{disclosed} = 5.74$, $SD = 1.19$, $M_{non-disclosed} = 5.06$, $SD = 1.46$, $F(1, 193) = 12.02$, $p = .001$), and overall perceived brand equity ($M_{disclosed} =$

4.95, $SD = 1.50$, $M_{non-disclosed} = 4.39$, $SD = 1.76$, $F(1, 193) = 5.51$, $p < .05$) than the no SMA information disclosures group. Hence, Hypothesis 1 is supported. The results indicate that disclosing SMA information can result in significantly higher consumer evaluations when compared with no SMA information disclosure.

Insert Table 1.4 here

4.1.2.3.2. Interaction effect of SMA mere disclosures and the CSR involvement.

Hypothesis 4 argues for an interaction effect between SMA mere disclosure and CSR involvement on consumer evaluations. Specifically, I argue that the positive effect of SMA mere disclosure will be amplified for participants with higher rather than lower CSR involvement. To investigate the proposed interaction effect, I ran Preacher and Hayes' (2008) bootstrapping model (mean-centered for SMA disclosure and CSR involvement, model 1, $n = 10,000$) on all dependent variables while controlling for participants' demographics. Results did not provide support for significant interactions on both dependent variables. Hence, Hypothesis 4 is not supported.

4.1.3. Study 2: SMA breadth disclosure.

With a 2 (SMA environmental dimension: with vs. without) \times 2 (SMA social dimension: with vs. without) between-subject factorial design, Study 2 tests hypotheses pertaining to SMA breadth disclosures. The goal for Study 2 is to study how disclosing SMA at varying breadth will influence consumer evaluations. Four different scenarios corresponding to different SMA breadth are examined: (SMA) from both the environmental and social dimensions; only from the environmental dimension; only from the social dimension; from neither dimension.

4.1.3.1. Procedures.

Similar to Study 1, participants at all scenarios were asked to imagine shopping for a computer and were presented with an online e-commerce webpage with the title of “*Feature brands: Eco-friendly companies.*” The e-commerce site depicted basic product information (i.e., brand name and logo, product images, product specification), and a banner with contextual information from the manufacturer about SMA engagement: “*We hope to exert influence over the supply chain to lead our suppliers to comply with our code of conduct. Our supplier code of conduct sets forth our commitment to integrity and compliance within its global supply chain.*” The main manipulation was information disclosure about firms’ SMA breadth. Excerpts of SMA from the environmental dimension described firms were monitoring their suppliers’ environmental practices (e.g., carbon footprint, energy/water consumption, and waste recycling). Excerpts of SMA from the social dimension depicted that firms were monitoring their suppliers in social issues (e.g., diversity, human right, and community service). Excerpts of SMA from the both dimensions depicted that firms were monitoring their suppliers in both the environmental and the social issues. See Table 1.5 for the language used in each stimulus and Appendix 1.C for an example of the stimulus (i.e., SMA from the both dimensions condition). After seeing the webpage stimulus, participants were asked about their perceptions toward the firm, CSR involvements and demographic information.

Insert Table 1.5 here

4.1.3.2. Measures.

The primary independent variable in Study 2 was the information about the SMA breadth, which was captured by a categorical variable with three levels: with the broadest breadth disclosed SMA from the both dimensions, followed by the single dimension disclosure,

and by the no-dimension disclosure. Same moderator (i.e., CSR involvement), control variables (i.e., demographic information) and dependent variables (i.e., attitude toward the firm, overall perceived brand equity) were collected in Study 2.

4.1.3.3. Results.

4.1.3.3.1. Main effect.

Table 1.6 provides descriptive statistics on each variable in Study 2. Hypothesis 2a predicts that disclosing SMA from both environmental and social dimensions (the broadest breadth) will lead to the highest consumer evaluations, followed by the single dimension disclosure, and by the no dimension disclosure. A one-way ANOVA test shows significant group differences in attitude toward the firm ($F(3, 346) = 5.51, p < .001$), and overall perceived brand equity ($F(3, 346) = 2.27, p < .10$). A follow-up Tukey post hoc test offers some interesting insights regarding different conditions' comparison. Specifically, disclosing SMA information from a single dimension generated significantly higher attitude toward the firm ($M_{single} = 5.63, SD = 1.13, M_{no-disclosure} = 5.06, SD = 1.46, p < .001$), and overall perceived brand equity ($M_{single} = 4.48, SD = 1.14, M_{no-disclosure} = 4.11, SD = 1.59, p = .05$) than the no dimension disclosure scenario. Similarly, disclosing SMA information from the both dimensions leads to higher attitude toward the firm ($M_{both} = 5.70, SD = 1.25, M_{no-disclosure} = 5.06, SD = 1.46, p < .01$) than the no dimension disclosure. However, there is no evidence that disclosing from the both dimensions generated higher evaluations ($p = NS$ for all dependent variables) than disclosing from a single dimension. Hence, Hypothesis 2a is partially supported, while disclosing the SMA dimension information results in higher consumer evaluations than the no dimension disclosure, expanding the breadth of disclosure from a single dimension to the both dimensions does not lead to additional increases in evaluations.

Insert Table 1.6 here

4.1.3.3.2. Interaction effect of SMA dimension disclosures and the CSR involvement.

Recall that Hypothesis 5a argues for an interaction between the SMA breadth disclosure (i.e., no dimension disclosure vs. single dimension disclosure vs. both dimensions disclosure) and the CSR involvement on consumers' evaluations, I tested this hypothesis with Preacher and Hayes' (2008) bootstrapping model (mean-centered for the SMA breadth and the CSR involvement, model 1, $n = 10,000$). Given that my independent variable had three conditions, I followed the tutorial by Hayes and Montoya (2017) and specified a multi-categorical predictor. Specifically, I transformed the three-level independent variable into two dichotomous variables (D_1 , D_2) with the base level (i.e., no dimension disclosure) coded as $D_1 = 0$, $D_2 = 0$, single dimension disclosure coded as $D_1 = 1$, $D_2 = 0$ and both dimensions disclosure coded as $D_1 = 0$, $D_2 = 1$. Then I ran the regression by including consumer evaluations as dependent variables, the CSR involvement, D_1 , D_2 and the interaction terms ($D_1 \times$ CSR involvement; $D_2 \times$ CSR involvement) as independent variables, and demographic information as control variables. Table 1.7 presents the moderation results.

Insert Table 1.7 here

Results identified significant two-way interactions between the SMA breadth disclosure and the CSR involvement on the attitude toward the firm ($F(9, 358) = 13.83$, $b = -.31$, $SE = .12$, $p < .05$, 95% CI $[-.5453, -.0695]$), and on the overall perceived brand equity ($F(9, 358) = 21.34$, $b = -.29$, $SE = .14$, $p < .05$, 95% CI $[-.5575, -.0159]$). Figure 1.1 and 1.2 depict the interactions of the SMA breadth information disclosures and the CSR involvement on the attitude and the overall perceived brand equity, respectively. Both figures present a similar pattern: while there is a positive main effect, there is no significant interaction when compare the no dimension

disclosure group with the single (or both) dimension disclosure groups. However, the interaction of CSR involvement and the SMA breadth disclosure is significant when comparing the single dimension disclosure group with the both dimensions disclosure group. For people with low CSR involvement, disclosing SMA from a single dimension generates higher evaluations than disclosing from the both dimensions; differently, for people with high CSR involvement, disclosing SMA from the both dimensions leads to higher evaluations than a single dimension disclosure. Hence, I find support for Hypothesis 5a and conclude that the CSR involvement will enhance the positive effect of the SMA breadth disclosure.

Insert Figure 1.1 and 1.2 here

To further explore the effect of SMA dimension disclosure, I explicitly distinguished the single SMA dimension into the *environmental* or the *social* dimension, which resulted in a four-condition predictor (i.e., no dimension disclosure, environmental dimension disclosure only, social dimension disclosure only, and the both dimensions disclosure). I re-ran the interaction tests between the four-condition SMA breadth disclosures and the CSR involvement on all dependent variables. Results indicated a significant interaction between the SMA breadth disclosures and the CSR involvement on the attitude toward the firm, but not on the overall perceived brand equity. Table 1.8 presents the regression results and Figure 1.3 plots the interaction.

Insert Table 1.8 and Figure 1.3 here

As shown by Figure 3, when comparing the *social dimension disclosure only* scenario with the *environmental dimension disclosure only* scenario, a significant interaction emerges ($b = -.29$, $SE = .13$, $p < .05$, 95% CI $[-.5590, -.0236]$). For those with low CSR involvement, disclosing SMA from the environmental dimension generates lower attitude toward the firm

rating than disclosing SMA from the social dimension. Nevertheless, as people's CSR involvement increase, the positive effect of disclosing SMA from the environmental dimension increases. For people with high CSR involvement, disclosing SMA from the environmental dimension results in higher attitude rating than disclosing from the social dimension. Similar interaction is identified when comparing with the *environmental dimension disclosure only* scenario with the *both dimensions disclosure* scenario ($b = -.29$, $SE = .13$, $p < .05$, 95% CI [-.5682, -.0210]).

4.1.4. Study 3: SMA depth disclosure.

Study 3 tested hypotheses related to the effect of SMA depth disclosures on consumer evaluations. The scenario-based experiment used a 2 (SMA depth disclosure: first-tier SMA only vs. first- and lower-tier SMA) \times 1 between-subject design.

4.1.4.1. Procedures.

Similarly to Study 1 and 2, participants at all scenarios in Study 3 were told to imagine to shop a computer online and were shown a webpage of an e-commerce site with the title of "*Feature brand: Eco-friendly company.*" Each participant was provided the same contextual information about SMA from the webpage banner: "*The complex nature of the products means that the supply chain is also very complex, consisting of a huge variety of different materials used in products. This complexity means it is not only the Tier 1 supplier who is involved in material compliance, but compliance must be assured throughout the supply chain.*" Besides, basic product information (i.e., brand name and logo, product images, product specification) was provided for both groups.

The main manipulation in Study 3 was the information disclosed by the firm about its SMA depth. For the firm that only engaged and disclosed its first-tier SMA, the information was

provided following the contextual information: “*We do not have any direct purchasing relationship with lower-tier suppliers and only monitor our Tier 1 (direct) suppliers due to due to the lack of contractual leverage and visibility.*” Oppositely, for the firm that engaged and disclosed its first- and lower-tier SMA information, the following message was presented after the contextual information: “*Hence, we monitor our Tier 1 (direct) suppliers as well as lower-tier suppliers.*” See Table 1.9 for the exact language used in the stimulus and Appendix 1.D for an example of stimulus in Study 3.

Insert Table 1.9 here

4.1.4.2. Measures.

The main independent variable in Study 3 was the information about SMA depth, which was captured by a binary variable (0 = first-tier SMA only, 1 = first- and lower-tier SMA). Same moderator (i.e., CSR involvement), control variables (i.e., demographic information), and dependent variables (i.e., attitude toward the firm, overall perceived brand equity) were collected in Study 3.

4.1.4.3. Results.

4.1.4.3.1. Main effect.

Table 1.10 provides descriptive statistics of each variable in Study 3. Recall that Hypothesis 2b predicts that disclosing SMA at a greater depth (both first- and lower-tier SMA) will lead to higher consumer evaluations. Results of a one-way ANOVA tests provide strong support for this hypothesis. Disclosing the first- and lower-tier SMA leads to higher attitude toward the firm ($M_{\text{first-tier SMA}} = 4.38$, $SD = 1.47$, $M_{\text{first- and lower-tier SMA}} = 5.32$, $SD = 1.09$, $F(1, 183) = 24.14$, $p < .001$), and the overall perceived brand equity ($M_{\text{first-tier SMA}} = 3.60$, $SD = 1.49$, $M_{\text{first- and lower-tier SMA}} = 4.32$, $SD = 1.12$, $F(1, 183) = 24.14$, $p < .001$).

and lower-tier SMA = 4.34, SD = 1.21, $F(1, 183) = 13.71, p < .001$). Hence, Hypothesis 2b is strongly supported.

Insert Table 1.10 here

4.1.4.3.2. Interaction effect of SMA depth disclosures and the CSR involvement.

In Hypothesis 5b, I argue for the interaction effect between SMA depth disclosures and participants' CSR involvement: high CSR involvement will amplify the positive effect of SMA depth disclosures on consumer evaluations. To investigate the interaction, I ran Preacher and Hayes' (2008) bootstrapping model (mean-centered for SMA depth and CSR involvement, model 1, $n = 10,000$) on each of the dependent variable while controlling for demographics. I identified marginally significant interactions between SMA depth disclosures and the CSR involvement on the overall perceived brand equity ($F(7, 177) = 10.77, b = .30, SE = .18, p < .10, 95\% CI [-.0555, .6506]$), but not on the attitude toward the firm. Table 1.11 shows the regression results and Figure 1.4 plots the interaction on the overall perceived brand equity. Specifically, as expected, while disclosing SMA at a greater depth will positively affect consumer evaluations, CSR involvement enhances such positive effect. Hence, Hypothesis 5b is partially supported, only for the overall perceived brand equity measures.

Insert Table 1.11 here

Insert Figure 1.4 here

4.1.5. Study 4: lower-tier supplier monitoring mechanism disclosure.

Study 4 investigates the effect of communicating about the focal firm's lower-tier supplier monitoring mechanism on consumer evaluations. A 3 (Lower-tier supplier monitoring mechanism disclosure: direct monitoring vs. indirect monitoring vs. 3rd party organization monitoring) \times 1 between-subject design was used in Study 4.

4.1.5.1. Procedures.

Identical contextual information (online computer shopping, product characteristics, SMA context) was provided to each participant in Study 4. The main manipulation was the information disclosed by the firm about its SMA lower-tier supplier monitoring mechanism under the ‘*From the company*’ section. Participants were randomly assigned to one of the three groups that differed in the selected lower-tier monitoring mechanism. For the manufacturer that monitored its lower-tier suppliers directly (direct monitoring), the following description was provided: “*Audits are an important tool in examining suppliers’ adherence to expectations.*” Besides, examples of its direct monitoring were provided: “*Our on-site audits include: Interview with factory managers and workers; Health and safety inspection*” For the manufacturer that monitored its lower-tier suppliers indirectly (indirect monitoring), a short description and a few examples were provided: “*Our Tier 1 suppliers monitor their subcontractors on our behalf. Specifically, our Tier 1 suppliers must: Make sure their sub-contractors comply with our code of conduct; Disclose the name of all their sub-contractors*” For the manufacturer that adopted 3rd party organization to monitor its lower-tier suppliers (3rd party organization monitoring), the following information was shown: “*We require our Tier 1 and lower-tier suppliers to undergo Electronic Industry Citizenship Coalition (EICC)-certified third-party audits. The suppliers must: Undergo a full audit once every two years; Conduct as many follow-ups as necessary.*” See Table 1.12 for the stimulus language and Appendix 1.E for the stimulus used in Study 3.

Insert Table 1.12 here

4.1.5.2. Measures.

The main independent variable in Study 4 was the disclosed information about the focal firm's lower-tier SMA monitoring mechanism. Same moderator (i.e., CSR involvement), control variables and dependent variables were collected in Study 4.

4.1.5.3. Results.

4.1.5.3.1. Main effect.

Table 1.13 provides descriptive information on each variable in Study 4. Two conflicting hypotheses (i.e., Hypothesis 3a and 3b) predict the different effect of disclosing the lower-tier supplier monitoring mechanism on consumer evaluations. On the one hand, consistent with the signaling theory, Hypothesis 3a argues that the direct monitoring results in highest consumer evaluations, followed by the indirect monitoring and by the 3rd-party organization monitoring. On the other hand, based on third-party endorsement literature, Hypothesis 3b argues that using the 3rd-party organization monitoring leads to the highest consumer evaluations, followed by the direct monitoring and by the indirect monitoring. A one-way ANOVA test showed significant group differences in the overall perceived brand equity ($F(2, 235) = 4.09, p < .05$) across different monitoring mechanism groups, however, no difference has been identified for the attitude toward the firm. A follow-up Tukey post hoc test provided detailed insights regarding the group differences for the overall perceived brand equity. Specifically, monitoring lower-tier suppliers by using the direct monitoring generated significantly higher perceived brand equity than the indirect monitoring ($M_{direct} = 5.22, SD = 1.38, M_{indirect} = 4.60, SD = 1.58, p < .05$) and the 3rd-party organization monitoring ($M_{direct} = 5.22, SD = 1.38, M_{third-party\ organization} = 4.73, SD = 1.51, p < .10$). However, there is no evidence that the indirect monitoring is significantly different from the 3rd-party organization monitoring in the overall perceived brand equity. Hence,

the results provide support for Hypothesis 3a that using the direct lower-tier monitoring will lead to the highest consumer evaluations due to the highest associated signaling cost.

Insert Table 1.13 here

4.1.5.3.2. Interaction effect of lower-tier supplier monitoring mechanism disclosures and the CSR involvement.

Hypothesis 5c and 5d argue for interaction effects of lower-tier monitoring mechanism disclosures and the CSR involvement on consumer evaluations. To test the proposed interaction, I conducted a regression analysis using Preacher and Hayes' (2008) bootstrapping model (mean-centered for the SMA lower-tier monitoring mechanism disclosure and the CSR involvement, model 1, $n = 10,000$). Following the procedure of Hayes and Montoya (2017), I transformed the three-category (i.e., direct monitoring, indirect monitoring, and 3rd-party organization monitoring) lower-tier supplier monitoring mechanism disclosure variable into two dichotomous variables D_1 and D_2 . The regression included demographic information as controls, CSR involvement, D_1 , D_2 , CSR involvement $\times D_1$, and CSR involvement $\times D_2$ as the independent variables and consumer evaluation measures as dependent variables.

The findings reveal a marginally significant interaction between lower-tier supplier monitoring mechanism disclosure and the CSR involvement on the attitude toward the firm ($F(9, 228) = 4.75, b = .25, SE = .14, p < .10, 95\% CI [-.0255, .5198]$), but not on the overall perceived brand equity. Table 1.14 presents the results and Figure 5 plots the interaction. As shown by Figure 1.5, when comparing the indirect monitoring with the 3rd-party organization monitoring, the attitude rating differs between people with low and high CSR involvement. Specifically, for people with low CSR involvement, the 3rd-party organization monitoring leads to higher attitude rating than the indirect monitoring. For people with high CSR involvement, the

indirect monitoring tends to result in significantly higher attitude rating than the 3rd -party organization monitoring. Hence, Hypothesis 5c is partially supported, only for the attitude toward the firm.

Insert Table 1.14 here

Insert Figure 1.5 here

4.2. Archival Studies

The experiments described above allow me to establish causality between firms' SMA disclosure and individual consumer evaluations. Two additional archival studies were conducted, aiming to providing additional external validity to the experimental results and extend the findings to higher levels. The first archival study investigates the association between firms' SMA disclosures and organizational brand equity through a structured content analysis. The second archival study, aims to study how firms' SMA disclosures influence aggregated consumer sentiment through sentiment analysis on twitter data.

4.2.1. SMA and firm level brand equity.

4.2.1.1. Sample selection and data collection.

The current study tests the hypotheses in the context of selected U.S. manufacturing industries. Following the prior literature in sustainable supplier management (Wilhelm et al., 2016a), two industries of interest are determined: food (NAICS 311) and electronic products manufacturing (NAICS 334). These two industries are considered as appropriate for two reasons. First, both industries face high pressure from multiple stakeholders that require firms to pay close attention to their upstream suppliers (Pagell and Wu, 2009; Wu and Pagell, 2011; Wilhelm et al., 2016a). Firms in the electronics manufacturing industry source and assemble parts from a wide range of suppliers and are being pressured to monitor their upstream suppliers regarding

environmental and social issues (Lee and Kim, 2009). Similarly, stakeholders expect food manufacturers to supervise their suppliers in multiple areas such as animal welfare, biotechnology, health and human rights (Maloni and Brown, 2006; Wiese and Toporowski, 2013). Second, failure to monitor upstream suppliers has resulted in several scandals in these two industries (Sen and Bhattacharya, 2001; Wiese and Toporowski, 2013). For instance, in the food manufacturing industry, a leading German chicken producer was blamed when consumers found out that its upstream suppliers (i.e., farmers) ignored animal welfare standards. The supplier misconduct infuriated consumers and resulted in a huge reputational loss for the chicken retailer (Sen and Bhattacharya, 2001; Wiese and Toporowski, 2013). Similar examples can be found in electronic manufacturing industry. Apple, one of the most valuable and profitable electronics companies in the world, was under fire for outsourcing production to suppliers with poor employment conditions (Clarke and Boersma, 2017). Moreover, a series of suicides at the factories of Foxconn, the principal supplier of Apple, had negative effects on Apple (Dou, 2013; Lock and Seele, 2015; Clarke and Boersma, 2017). Hence, supplier monitoring is an important issue for firms in these two industries.

I compiled a dataset from a variety of archival data sources covering the 2012-2017 time period. This relatively recent period is chosen to ensure the greatest availability of data on firms' SMA (Hofer et al., 2012). Also, this period allows me to capture the latest developments on firms' sustainable practices. Data were collected from multiple secondary data sources including the electronic copies of corporate social responsibility (CSR) reports, and the Compustat Capital IQ database. Specifically, information on firms' SMA was extracted from CSR reports and complemented with financial data from the Compustat Capital IQ database.

There are several reasons for using firms' CSR reports as the primary source of information on firms' SMA. First, while various databases (e.g., KLD, MEPI, TRI) allow scholars to measure firms' general environmental performance, none of them provide detailed and comprehensive information regarding firms' SMA. Data availability is another limitation of these databases since they are typically limited in their coverage to selected industries, firms and time periods. One possible way to avoid such limitations is to rely on firms' CSR reports for sustainability related information (Montabon et al., 2007; Tate et al., 2010; Hofer et al., 2012). There are several benefits of using CSR reports as the primary data source. First, CSR reports usually disclose information about firms' sustainable practices in a detailed and comprehensive manner. Second, CSR reports are the most common media firms use to communicate their CSR activities and associated performance to stakeholders (Deegan and Gordon, 1996; Morhardt et al., 2002; Kolk, 2003; Tate et al., 2010). Nearly 60% of the top 200 global firms make CSR reports available on their corporate websites (Jose and Lee, 2007). In turn, stakeholders rely on these CSR reports to gain insights into how firms address relevant environmental and social issues. Consumers, as critical stakeholders, "use the information contained in the CSR reports to gauge involvement in and commitment to social and environmental issues via comparing reports among firms and industries" (Tate, 2010 p. 21). Thus, as a common and popular sustainability-related information disclosure media, CSR reports are a suitable primary data source for obtaining SMA information.

I employed a multi-step sampling procedure. First, I identified all publicly listed firms in the U.S. across the food and electronic manufacturing industries via the Compustat – Capital IQ database. Second, financial data were collected for each firm in the sample. In total, the initial sample included 625 U.S. public firms and 3,750 firm-year observations over the 2012-2017

period. Third, based on the list of firms I obtained from the previous step, two independent research assistants visited each firm's website to retrieve any CSR report published during 2012-2016 by using the website's 'sitemap' and 'search' function (Montabon et al., 2007). The results of their searches were compared against the list of available CSR reports published by the Global Reporting Initiative (GRI) to ensure that no reports were overlooked. After excluding the firms that did not publish any CSR reports and observations with missing values, the final sample size was reduced to 268 firm-year observations pertaining to 99 firms across the two industries. Table 2.1 summarizes the data construction and cleaning process.

Insert Table 2.1 here

4.2.1.2. Measurements of variables.

4.2.1.2.1. Temporal sequencing.

Since the current research focuses on investigating the effect of firms' communication about their SMA via CSR reports on their brand equity, I introduce a temporal sequence in the data whereby the outcome variable is measured in the quarter following the publication of the CSR report. Figure 2.1 illustrates the points in time and reference period of the key variables of interest in the research model.

Insert Figure 2.1 here

4.2.1.2.2. Dependent variables.

Consistent with prior literature (Simon and Sullivan, 1993; Anderson et al., 2004; Rao et al., 2004; Wang et al., 2009), the present study uses Tobin's Q as a proxy for brand equity due to the lack of a direct, objective brand equity indicator. As a market-based measure, Tobin's Q captures a firm's intangible assets and provides information regarding investors' expectations for a firm's future profit potential (Simon and Sullivan, 1993; Wang et al., 2009). For example,

Servaes and Tamayo (2013) link firms' corporate social responsibility activities to their brand equity, as measured by Tobin's Q. Defined as the ratio of the market value of a firm to the replacement cost of its tangible assets (Tobin, 1969, 1978). A low Tobin's Q (between 0 and 1) means that the cost to replace a firm's assets is greater than its stock value. Thus, a low Q ratio indicates that the firm's stock is undervalued. Conversely, a high Tobin's Q (greater than 1) indicates that the firm's stock is more expensive than the replacement cost of its asset, which implies that the possession of intangible assets. I computed Tobin's Q for each firm in each quarter over the six-year period. Consistent with the prior literature, I compute Tobin's Q as follows (Chung and Pruitt, 1994; Bharadwaj et al., 1999; Rao et al., 2004; Wang et al., 2009):

$$Q = (MV + PS + DEBT)/TA$$

Where:

MV is the product of closing price of share at the end of the financial year and the number of common shares outstanding,

PS is the liquidating value of the firm's outstanding preferred stock,

DEBT is calculated as the sum of the net current liabilities, book value of inventories and long-term debt.

TA is firm's book value of total assets.

Besides using the quarterly Tobin's Q as the brand equity measure, in the robustness test section, I also present the results using the quarterly change in Tobin's Q (i.e., Δ Tobin's Q), as well as average quarterly analyst sales estimates as alternative dependent variables. Collected from Thomson Reuters I/B/E/S database, the sales estimates data reflect analysts' insights and expectations regarding future sales for specific firm. The rationale for using the estimates data as an alternative measure is that a firm's SMA disclosure can positively affect analysts' expectations toward the firm, and thus results in higher future sales estimates.

4.2.1.2.3. Independent variables.

Two variables that capture a firm's first- and lower-tier SMA are key independent variables in the model. The first independent variable, First-tier SMA, is a binary variable that captures whether the firm discloses any information about its first-tier SMA. Similarly, the Lower-tier SMA variable captures whether the firm engages in any lower-tier SMA.

I conducted structured content analyses of firms' CSR reports to determine whether firms engage in first-tier and/or lower-tier SMA. Structured content analysis is "a methodological technique that enables researchers to systematically evaluate the qualitative content in all communication forms" (Tangpong, 2011 p. 627). This method has been widely adopted in various fields in the social sciences and business research, including supply chain management (Morris, 1994; Harwood and Garry, 2003; Montabon et al., 2007; Tate et al., 2010; Hofer et al., 2012).

In the present study, I employed a combination of automated software coding and subjective human coding to extract information on firms' SMA as outlined in Appendix 2.A. To begin, I generated dictionaries of key terms that describe firms' SMA, including supplier, monitor, and tier. The key words for the automated paragraph extraction, shown in Appendix 2.B, include not only these words but also their synonyms (e.g., vendor) as well as (broadly) related terms (e.g., procurement). I used these dictionaries to locate any potentially relevant paragraphs within the CSR reports. This part of the analysis was implemented in ATLAS.ti, a qualitative data analysis (QDA) software package. Next, I used the co-occur proximity operator within ATLAS.ti to extract paragraphs where 1) the keyword "monitor" (or its synonymous terms) co-occurs with the keyword "supplier" (or its synonymous terms) (named Set A); and 2) the keyword "tier" (or its synonymous terms) co-occurs with the keyword "monitor" (or its

synonymous terms) (named Set B). The co-occur proximity operator located and extracted the paragraphs where the two keywords (and their synonymous terms) co-occurred.

The human coding exercise built on the outputs of the automated content analysis described above. Two human coders read and interpreted the paragraphs extracted from Set A and Set B to determine whether the firm engaged in any first-tier and lower-tier supplier monitoring activities respectively. Both coders were unfamiliar with the research questions and went through comprehensive training processes before coding the text excerpts. The coders were instructed to read through the paragraphs in their entirety to assess if any SMA were discussed and, based on their assessments, coded the binary First-tier SMA and Lower-tier SMA variables.

To make sure the subjective coding was reliable and valid, 74% of the sample was double-coded such that inter-rater reliability (IRR) can be assessed (Tangpong, 2011; Hallgren, 2012). While the percentage of agreement has been used as measure of IRR measure in many prior studies, it does not account for chance agreement (Cohen, 1968; Tangpong, 2011; Krippendorff, 2018). More appropriate and rigorous IRR measures include Cohen's kappa, a chance-corrected agreement coefficient (Harwood and Garry, 2003) and the Intra-Class Coefficient (ICC), a commonly-used measure for examining IRR for ordinal, interval, and ratio variables (Curcuruto et al., 2014). Different from Cohen's kappa, the ICC measure incorporates the magnitude of the disagreement such that "larger-magnitude disagreements resulting in lower ICCs than smaller-magnitude disagreements (Hallgren, 2012 p. 9)."

The present study evaluated IRR by using both Cohen's kappa and ICC. The total sample included 518 coded units, and I calculated IRR for a sub-sample of 384 double-coded units. The resulting IRR indicators (Cohen's kappa = 0.74, ICC= 0.86) were both greater than the suggested

0.7 cutoffs, indicating a high degree of agreement between raters (Tangpong, 2011; Neuendorf, 2016).

4.2.1.2.4. Measurement validation

To provide external validation of the content analysis-based SMA measure, the present study examines the correlation between this measure and an alternative SMA measure obtained from an external database. Specifically, I retrieved an SMA measure from a dataset of environmental, social and governance (ESG) scores that is provided by Sustainalytics, a leading firm in sustainability analysis (Auer, 2016; Orlitzky et al., 2017; Francoeu et al., 2019). For a wide range of firms, this dataset offers time series ESG scores (ranging from 0 to 100) that are based on over 70 indicators (see Auer, 2016 for detailed information about Sustainalytics). While Sustainalytics provides numerous indicators about firms' ESG performance, the present study only focuses on SMA-related indicators. Specifically, one indicator is selected: "supply chain monitoring system," which is defined as the "assessment of whether the company has a supply chain monitoring system and/or whether there are other supply chain monitoring activities." If the SMA measures from content analysis are valid, they should be significantly and positively correlated with the SMA-related indicator from Sustainalytics. Hence, I first match the firm-year observations in the sample with the supply chain monitoring scores that are provided by Sustainalytics. Among the 311 observations in my sample, matching Sustainalytics scores are available for 147 firm-years. Then, I examine pairwise comparisons between the SMA measures from the content analysis and the indicator from Sustainalytics. I find that the first-tier SMA variable is positively correlated with Sustainalytics' supply chain monitoring system measure ($r = .19, p < .05$). Similarly, the lower-tier SMA measure is positively correlated with the supply

chain monitoring system score ($r = .16, p < .10$). Thus, the results provide additional validation for the SMA measures used in the present study.

4.2.1.2.5. Control variables

Based on prior research, the regression model includes several control variables that are found to affect firm level brand equity (Morck et al., 1988; McWilliams and Siegel, 2000; Servaes and Tamayo, 2013). These control variables include industry (Wang et al., 2009), the lagged value of Tobin's Q, firm size, advertising intensity, and research and development (R&D) intensity (Servaes and Tamayo, 2013). A binary variable indicating whether the focal firm operates in the electronic products manufacturing industry (as opposed to the food industry) is included to account for potentially systematic between-industry differences in the level of Tobin's Q. Firm size is another factor that may influence Tobin's Q: larger firms tend to be older and have fewer investment opportunities than younger firms, thus resulting in lower Tobin's Q values (Servaes and Tamayo, 2013; Rao et al., 2004). Firm size is measured as the book value of total assets. Prior research has also shown that advertising and R&D expenditures create value and, thus, may positively affect Tobin's Q (Servaes and Tamayo, 2013). Advertising intensity is computed as the ratio of advertising expenditures and total sales, and R&D intensity is computed by dividing R&D expenditures by total sales. Quarterly advertising expenditures are missing for half of the firms on Compustat since no disclosure will be made if the expenditures are immaterial (Servaes and Tamayo, 2013).

Table 2.2 summarizes the variable definitions and associated operationalization, while Table 2.3 presents descriptive statistics and pairwise correlations. The relatively large correlation coefficients between the measures of quarterly Tobin's Qs across two periods are expected, and the correlation coefficients between other variables are well below the 0.7 cutoff, suggesting that

multicollinearity may not be a significant concern. The firm size (total assets) and quarterly analyst estimate variables violate the skewness and kurtosis assumptions and, therefore, are log-transformed prior to the empirical analysis. Hence, the estimating equation of the present study is as follows:

$$Q_{it} = \beta_0 + \beta_1 \text{Electr. products mfg.}_i + \beta_2 \text{Tobin's } Q_{i(t-1)} + \beta_3 \text{Advertising Intensity}_{it} + \beta_4 \text{R\&D Intensity}_{it} + \beta_5 \log_{10}(\text{Total Asset})_{it} + \beta_6 \text{First-tier SMA}_{it} + \beta_7 \text{Lower-tier SMA}_{it} + \varepsilon_{it}$$

Insert Table 2.2 here

Insert Table 2.3 here

4.2.1.3. Estimation and results.

4.2.1.3.1. Estimation methodology and empirical results.

I used a panel data technique to estimate the model. One common diagnostic issue in panel data analysis is heteroscedasticity (Yao et al., 2013). Indeed, both the modified Wald test ($\chi^2 = 3.8E-33$, $p < .001$) (Greene, 1997) and the Breusch-Pagan/Cook-Weisberg test ($\chi^2 = 400.59$, $p < .001$) indicate the presence of heteroscedasticity in the model. Besides, given that the sample includes repeated observations of the same firms across multiple years, autocorrelation is a common concern (Emery and Marques, 2011; Yao et al., 2013). An autocorrelation test was conducted and the result presents some evidence of first-order autocorrelation (AR1) in the data ($F(1, 42) = 3.19$, $p = 0.08$) (Wooldridge, 2010).

To address the concerns outlined above, I use a generalized least square (GLS) estimator. This method accounts for heteroscedasticity across unbalanced panels in the data. Second, the GLS approach accommodates the inclusion of lagged values of the dependent variable as a predictor (Gedajlovic and Shapiro, 2002; Zhang and Rajagopalan, 2010). Hence, consistent with prior studies that had similar data characteristics (e.g., Emery and Marques, 2011; Shou et al.,

2016), I employed the panel GLS estimation technique with panel-specific AR1 and heteroscedasticity specifications in STATA (Cheng and Nault, 2007; Yao et al., 2013; Su et al., 2015).

Table 2.4 presents the estimation results and model fit statistics. Nineteen observations were excluded because there was only one observation within the group. Model 1 is the baseline model with only control variables, while Model 2 includes the first-tier and lower-tier SMA variables of interest in my research. The Wald statistic for Model 2 is 32,764.75 ($p < .001$). The empirical results are largely consistent with predictions: firm size negatively and significantly affects a firm's brand equity. Advertising intensity positively influences firms' brand equity, while R&D intensity has a significant and negative effect on brand equity. Importantly, the coefficient for first-tier SMA is positive and significant ($\beta = .05$, $p < .001$), indicating a positive association between firms' disclosures about first-tier SMA and their brand equity. Similarly, the coefficient for lower-tier SMA is also positive and marginally significant ($\beta = .02$, $p < .10$), suggesting that aside from the benefits of first-tier SMA disclosure, firms' lower-tier SMA communications can lead to incremental increases in brand equity. Interestingly, the magnitude of the positive effects on brand equity differs between first- and lower-tier SMA: the first-tier SMA results in a significantly stronger positive effect than lower-tier SMA ($\Delta \beta = 64\%$, $p < .05$).

Insert Table 2.4 here

4.2.1.3.2. Robustness Tests.

In order to show that the findings are robust with regard to measurement, two alternative dependent variables were used. Table 2.5 summarizes the robustness analyses. First, ΔQ was used as the key dependent variable in lieu of the nominal value of Tobin's Q (see Models 3 and 4 in Table 2.5). The estimation results are consistent with those presented in Table 2.4. Second,

analysts' forecast estimates were used as the dependent variable. Given that analysts rely on information from various sources to generate forecast estimates, I argue that firms' SMA disclosures can potentially influence analysts' estimates. Again, the results for Models 5 and 6 in Table 2.5 produce largely consistent estimation results: First-tier SMA positively and significantly influences analysts' estimates. However, lower-tier SMA does not appear to have a significant effect. This finding suggests that first-tier SMA is a more important determinant of brand equity (Tobin's Q) than lower-tier SMA.

Insert Table 2.5 here

4.2.2. SMA and Consumer Sentiment.

4.2.2.1. Data collection.

To further investigate the effects of firms' SMA disclosures on consumer evaluations at an aggregate level, I investigate whether such disclosures will result in differences in consumer sentiments toward the firm. To this end, I supplement the archival data set discussed previously with consumer sentiment data extracted from Twitter. The final sample includes panel data for 100 firms that publish CSR reports over the period from 2012 to 2017 ($N = 100, T = 6$), resulting in 311 firm-year observations. Lastly, I exclude observations that have missing values, resulting in a 267 firm-year observations across 99 firms. See Table 3.1 for summary information on the composition of the sample.

Insert Table 3.1 here

4.2.2.2. Dependent variable.

4.2.2.2.1. Consumer sentiment toward a firm.

Consumer sentiment refers to the valence of consumers' opinions of firms' actions, products and services (Homburg et al., 2015b) and is an important measure of consumer attitude

and evaluations. Prior literature has used consumer sentiment to evaluate product quality (Yi et al., 2003; Miyoshi and Nakagami, 2007; Blair-Goldensohn et al., 2008), assess firms' behaviors (Miller and Tucker, 2013; Homburg et al., 2015a), and predict stock market performance (Das and Chen, 2001; Gu et al., 2006; Bollen et al., 2011). In the present study, I aim to explore how focal firms' SMA disclosures affect consumer sentiment as evidenced in social media, a platform widely used by consumers to express their opinions (Godes and Mayzlin, 2004).

4.2.2.2.2. Source data: Twitter

Consumer sentiment information is extracted from Twitter, which is an ideal platform for the current study for several reasons (Culotta and Cutler, 2019). First, consumers widely and increasingly use Twitter to share their thoughts and sentiments on a variety of topics. About 20% of U.S adults were active on Twitter in 2014, and this percentage has continued to grow over time (Duggan et al., 2015). Moreover, as of mid-2013, about 77% of Fortune 500 companies were active on Twitter (Barnes et al. 2013), thus providing a platform for consumers to share their thoughts and opinions. Indeed, prior research has found Twitter to host more brand-related content than Facebook or Youtube (Kwon and Sung, 2011; Culotta and Cutler, 2019) and concluded that Twitter "has emerged as a powerful channel for expressing and measuring consumer behavior and attitudes, frequently leveraged by marketers and brand managers to understand nearly real-time sentiments" (Zimmers and Proferes, 2014 p.250). Finally, Twitter data are organized and accessible. Tweets are short and concise (Ma et al., 2015), time-stamped, and can be searched for specific keywords or keyword combinations. Therefore, given its popularity, relevance and organized data structure, Twitter is an appropriate platform for the assessment of consumer sentiment toward particular firms at given points in time.

4.2.2.2.3. Data collection procedure.

I filtered the Twitter data by imposing several restrictions during data collection. First, I focused on firms within two industries (i.e., electronic manufacturing industry and food manufacturing industry) over six-year time period (i.e., 2012-2017). Second, I only included firms that published annual CSR reports since these reports allowed me to determine, via structured content analysis, whether or not firms disclose their SMA. Based on the month in which the respective CSR reports were published, I extracted all tweets that were posted (1) one month before, (2) during, and (3) one month after the CSR report publication for all companies in the sample. For instance, if a focal company's CSR report was published in January 2013, tweets that mentioned the company by name would be collected if they were posted in December 2012 (one month before the publication), January 2013 (publication month) and February 2013 (one month after the publication). To ensure that I capture tweets from consumers rather than posts from firms themselves, I used company names as identifiers and excluded tweets associated with companies' official twitter handles during the search process. All tweets were extracted via Python from the Twitter website.

I further limited the data extraction to SMA-related tweets by applying the sustainability language dictionary developed by Lee et al. (2013) (see Appendix for the list of key terms), as well as the previously discussed SMA dictionary (i.e., suppl, vendor, audit) during the search process. For the 100 firms in the sample, the number of the extracted tweets for a single firm ranged from 0 to 10,224 for each time period, and totaled 344,973 tweets across all firms across all time periods.

4.2.2.2.4. Sentiment analysis procedure.

The key dependent variable in this study is the sentiment score, also known as polarity, extracted from the set of tweets about a given firm during the month in which the firm's CSR report was published (Pang and Lee, 2008; Johnson et al., 2015). While different techniques can be used to conduct sentiment analyses such as thematic analysis, bag-of-words analysis (Banks et al., 2018), I selected a natural language processing approach that assesses the sentiment expressed in the set of tweets by means of opinion words that convey negative (e.g., "horrible") or positive (e.g., "great") emotions. Specifically, AFINN (Nielsen, 2011), a word-based classifier of sentiments based on a dictionary of emotionally rated English words, is used in the current study as the opinion lexicon. The AFINN lexicon includes 2,476 seed adjectives that are each associated with a pre-defined orientation (879 positive words and 1,597 negative words).

The use of AFINN in the current study is justified for two main reasons. First, the AFINN dictionary includes emotional scores for a large number of English words (Bradley and Lang, 1999) and is tailored to the internet context and, thus, especially suitable for analyzing micro blogs, discussion forums, and tweets (Nielsen, 2011; Johnson et al., 2015). Second, AFINN has been used in prior research (Johnson et al., 2015) and produces sentiment scores that are easy to interpret: AFINN assigns a score to each tweet based on the emotions expressed in the text. A negative score indicates negative polarity while a positive score implies positive polarity. The magnitude of the score shows the intensity of the emotion. For example, a consumer's tweet about Nestle, posted on 03/20/2017, read as follows: "A good example of a disclosure for the CA Transparency in Supply Chains Act." Such a tweet is assigned a score of +3 according to the AFINN dictionary. Specifically, the word "good" is the only word in the tweet that expresses emotion, and the sentiment score corresponding to the word "good" is +3, resulting in a +3 score

for this tweet. Another tweet commented on Apple and was posted on 02/27/2013: “Chinese labor watchdog (there is such a thing?) says Apple is failing to monitor working conditions at its suppliers.” This tweet results in a score of -2 since the word “failing” conveys a negative emotion that is associated with a sentiment score of -2. A tweet about Kellogg’s (posted on 05/19/2014) that reads “W.K.Kellogg Foundation launches Online Racial Equity Guide” was determined to convey no emotion and, thus, given a score of zero. All extracted tweets corresponding to one firm-month were analyzed at the same time, resulting in one aggregated score for each firm and time period.

Following prior research, I processed and cleaned the Twitter data before calculating sentiment scores (Zhang et al., 2011). First, all of the collected tweets were pre-processed to remove the HTML formatting (Banks et al., 2018). Second, I stripped extra whitespace from all tweets and removed any duplicate tweets (Younis, 2015). Lastly, irrelevant elements including punctuation, stop words (e.g., the, after, upon) and numbers were removed (Lewis et al., 2004; Kumar and Sebastian, 2012). After the data cleaning procedure, all tweets were tokenized and converted to corpora, a large and structured set of texts that are electronically stored and processed, before proceeding with the analysis (Zhang et al., 2011). The sentiment analysis was then performed in RStudio.

4.2.2.2.5. Sentiment scores.

To control for cross-industry differences in sentiment scores in a given time period, standardization and normalization procedures were employed prior to data analysis (Dess et al., 1990; Cao and Dowlatshahi, 2005). The numbers of tweets extracted can be significantly different across firms such that firms with greater numbers of tweets are likely to have greater sentiment scores. For instance, firms such as Apple had more than 10,000 extracted tweets for a

given time period. On the other hand, firms such as Archer Daniels Midland (ADM) or Conagra Brands had as few as 30 tweets for a given time period. Hence, the former firms can have significantly higher sentiment scores as compared to the latter firms. To control for the number of tweets, standardized AFINN scores were computed as follows:

$$AFINN_{\text{standardized } it} = \frac{AFINN_{it}}{\# \text{ of tweets}_{it}}$$

Consumer sentiments can also systematically differ between industries. To control for between-industry differences, a normalization procedure was employed. That is, firms in the sample were split into different sub-samples based on their four-digit NAICS codes, and the standardized AFINN scores were normalized within each four-digit NAICS group and time

$$\text{period: } AFINN_{\text{normalized } it} = \frac{AFINN_{\text{standardized } it} - \overline{AFINN}_{\text{within-industry } t}}{\sigma_{AFINN_{\text{within-industry } t}}}$$

4.2.2.3. Independent variables.

Given this study's focus on the effect of firms' SMA disclosure, two variables capturing firms' SMA practices are the key independent variables of interest. The first independent variable, First-tier SMA, is a binary variable that identifies whether the firm discloses any information about its first-tier SMA. Similarly, the Lower-tier SMA variable captures whether the firm engages in any lower-tier SMA. Both measures were extracted from firms' annual CSR reports via a structured content analysis.

I also collected data on a set of control variables to capture the potential effects of industry affiliation, firm size, and firm performance corresponding to the quarter prior to a focal firm's CSR report publication on consumer sentiment. Consumer sentiments likely differ between food manufacturers and electronic product manufacturers since the former are more related to consumer health than the latter. Hence, a binary variable is included to capture whether a focal firm belongs to the electronic product manufacturing industry (Electr. products mfg.).

Firm size can be another factor that influences consumer sentiments. Consumers might perceive larger firms, which have access to more resources and enjoy greater visibility, to be more likely to engage in SMA (McGuire et al., 1988; Johnson and Greening, 1999; Udayasankar and Das, 2007), thus resulting in greater sentiment scores for these firms. In order to control for firm size, total revenue of a focal firm in the quarter prior (Revenue) to a focal firm's CSR report publication is included in the regression model. In addition, quarterly Sales growth, and ROA are included to control for potential effects of firm financial on consumer sentiment. Sales growth is a "market measure of effectiveness that specifically focuses on the degree to which customers were accepting the firm's products and/or services" (Snell and Youndt, 1995 p. 719) and serves as a good complement to ROA, which is an efficiency-focused measure. Besides, prior research provides strong evidence that a focal firm's current reputation is strongly and positively related to the focal firm's prior reputation (Hammond and Slocum, 1996; Roberts and Dowling, 2002). Similarly, previous consumer sentiments, as a proxy of a focal firm's word of mouth reputation (Homburg et al., 2015b), should significantly influence current consumer sentiments. Hence, I control for the sentiment score one month before the firm's CSR report publication (i.e., $AFINN_{i,t-1}$). Lastly, focal firms' investments in advertisement and R&D may influence consumer sentiments (Servaes and Tamayo, 2013). Hence, I control for R&D intensity, the ratio of quarterly R&D expenses and quarterly sales, as well as advertising intensity. The latter is obtained by dividing a firm's annual advertising expenses by annual sales (advertising expenses are not available on a quarterly basis).

Insert Table 3.2 here

Insert Figure 3.1 here

Descriptive statistics and pairwise correlations are provided in Table 3.2. As shown in Table 3.2, firms in the sample have \$ 4,542.93 million in average quarterly revenue with a standard deviation of \$ 8,203.41 million such that the *Revenue_{it}* variable violates skewness and kurtosis assumptions. Hence, the *Revenue_{it}* variable enters the model in logarithmic form. All other correlation coefficients are well below the 0.7 cutoff (Hair, 2006; Terjesen et al., 2010), indicating that multicollinearity is not a pertinent concern. Figure 3.1 summarizes the temporal sequencing of all variables in the model, and the estimation equation is shown below:

$$\begin{aligned}
 AFINN_{normalized\ it} = & \beta_0 + \beta_1 \text{Electr. products mfg}_i + \beta_2 \log(\text{Revenue})_{it} + \beta_3 \text{Sales} \\
 & \text{growth}_{it} + \beta_4 \text{Return on assets}_{it} + \beta_5 AFINN_{normalized\ it-1} + \beta_6 \\
 & \text{R\&D intensity}_{it} + \beta_7 \text{Advertising intensity}_{it} + \beta_8 \text{First-tier SMA}_{it} \\
 & + \beta_9 \text{Lower-tier SMA}_{it} + \varepsilon_{it}
 \end{aligned}$$

4.2.2.4. Empirical analysis and results.

4.2.2.4.1. Estimation methodology and empirical results.

Given that the sample includes multiple firms across a six-year period, I used a panel data technique for model estimation. Two concerns related to the analysis of panel data are autocorrelation and heteroscedasticity. An autocorrelation test was conducted and the results indicated that no first-order autocorrelation is present ($F(1, 44) = 1.461, p = 0.23$) (Wooldridge, 2010). However, while autocorrelation is not an issue, a modified Wald test (Greene, 1997) provides strong evidence for the presence of heteroscedasticity ($\chi^2 = 3.4e+30, p < .001$). In order to address the issue of heteroscedasticity, I employed the feasible generalized least squares (FGLS) method using Stata's *xtgls* command (Cheng and Nault, 2007; Yao et al., 2013). The estimation results and the associated model fit statistics are reported in Table 3.2. Model 1 is the baseline model, while Model 2 includes the key predictors, first-tier SMA, and lower-tier SMA.

The coefficient for first-tier SMA is positive and significant ($\beta = .22, p < .001$), indicating that a focal firm's first-tier SMA disclosures positively and significantly affect consumer sentiments toward the focal firm. However, the results fail to provide evidence that a focal firm's lower-tier SMA communication significantly influences consumer sentiments toward the focal firm since the associated coefficient estimate is statistically insignificant.

A further test is employed in order to answer the question of how long such a positive effect of focal firm's SMA disclosures on consumer sentiments may last. To explore this question, I regressed the sentiment score of tweets that are posted one month after the firms' CSR report publications on the same set of predictors. Models 3-4 in Table 3.3 present the estimation results and associated model fit statistics. Interestingly, when using consumer sentiments one month after the CSR report publication as the dependent variable, the effects of both first-tier SMA and lower-tier SMA are insignificant, indicating that the positive effect of firms' SMA disclosures diminishes over time.

Insert Table 3.3 here

4.2.2.4.2. Robustness tests.

To assess the sensitivity of these results, I conducted two sets of robustness checks that use an alternative sentiment measure and an alternative estimation technique. First, I tested the robustness of the results by using an alternative opinion lexicon: RStudio's built-in polarity (Hu and Liu, 2004; Mostafa, 2013). As compared to the AFINN measure, the polarity measure relies on a different opinion lexicon that is based on the dictionary compiled by Hu and Liu (2004) and is specially designed for analyzing consumer reviews (Archak et al., 2011). This opinion lexicon includes approximately 6,800 seed adjectives with known orientation (2,006 positive words and 4,783 negative words) (Mostafa, 2013). The built-in polarity function provides standardized

outputs by dividing the sum of sentiment scores by the total number of sentences and, thus, is different from AFINN, which provides absolute sentiment scores (from -5 to +5) for each word that is associated with an emotion. Hence, there was no need to standardize the polarity measures; only the normalization procedure was employed to control for systematic inter-industry and between-time differences. Models 5 and 6 in Table 3.4 present the estimation results and the associated model fit statistics for the polarity sentiment measure. The results are consistent with the main model—indicating that firms’ first-tier SMA disclosures have a significant positive effect on consumer sentiment (assessed in the month during which the CSR reports were published), while the effect of lower-tier SMA disclosure on consumer sentiment is, again, not statistically significant.

To show that my results are robust when using a different estimation technique, I performed additional analyses using generalized estimating equations (GEE). The GEE model is chosen because it not only accounts for both within- and between-variance (Ballinger, 2014) but also allows researchers to specify the correlation structure of the data (Zorn, 2001). Using Stata’s `xtgee` command, the dependent variable (i.e., $AFINN_{normalized\ it}$) was regressed on the same independent and control variables. Models 7 and 8 in Table 3.4 present these estimation results. Again, there are no substantive differences in the results as compared with those presented earlier (Table 3.2, Model 2).

Insert Table 3.4 here

5. DISCUSSION AND CONCLUSION

The purpose of this section is to summarize the results of the three empirical studies, derive insights to spur future academic research, and guide practitioners toward better decision making. First, the detailed results across three empirical studies regarding the effect of supplier monitoring activities (SMA) disclosures on consumer evaluations, aggregate consumer

sentiment and firm-level brand equity are summarized. Next, based on these findings, I elaborate on the theoretical contributions and managerial implications. Finally, the limitations of this research and potential opportunities for future study are discussed.

5.1. Findings

5.1.1. Vignette-based experimental study.

Four vignette-based experiments provide evidence that disclosing SMA and its related characteristics significantly affect consumer evaluations toward the focal firm at the individual level. Also, individual factors such as consumers' CSR involvement play an important role in the relationship between SMA disclosure and consumer evaluations. Specifically, the study provides strong evidence that merely disclosing SMA positively influences consumer evaluations toward firms, and such positive effects do not differ across people with varying CSR involvement.

Interestingly, the particular SMA characteristics that are disclosed also influence consumer evaluations. Regarding SMA breadth, disclosing that the focal firm engages in either environmental or social SMA results in significantly higher consumer evaluations as compared to when such detail is not communicated. There is, however, no evidence that SMA in both environmental and social dimensions carries incremental benefits in terms of consumer evaluations. Moreover, I find that the positive effect of SMA breadth tends to be amplified for consumers with high CSR involvement.

In terms of the effect of disclosing the depth of SMA, there is a positive relation between SMA depth disclosure and consumer evaluations: consumers generate higher evaluations toward firms that monitor both first- and lower-tier suppliers compared to those who only monitor their first-tier suppliers. Again, such a positive association is stronger for consumers that have high CSR involvement. In addition, I find that the SMA lower-tier supplier monitoring mechanism

used by a firm affects consumer evaluations. Specifically, the results provide support for the signaling cost argument that monitoring lower-tier suppliers via direct monitoring, which is associated with the highest signaling cost, results in higher consumer evaluations than indirect monitoring and third-party organization monitoring. Similarly, CSR involvement moderates the relationship between lower-tier supplier monitoring mechanism disclosure and consumer evaluations: the positive effect of direct monitoring is enhanced for consumers with high CSR involvement.

5.1.2. SMA and consumer sentiment.

Going beyond the individual level, a sentiment analysis of tweets is conducted to further explore the effect of firms' SMA disclosures on aggregate consumer sentiment toward firms. To this end, I sampled firms in the electronics manufacturing and food industries that published corporate social responsibility from 2012 to 2016. A systematic content analysis was carried out to extract the report publication date information and identify whether the focal firm engaged in any SMA. Across a three-month period, SMA and focal firm-related tweets were extracted, and a natural language processing approach was employed for sentiment analysis. Results provide evidence that a firm's SMA engagement significantly affects consumer sentiment toward the focal firm. These results are robust when alternative sentiment measures and different estimation techniques are used, offering further evidence for the positive effect of SMA engagement on consumer sentiment. Interestingly, the positive effect tends to diminish after a short period. Although SMA is still positively and significantly associated with consumer sentiment in the month after the CSR report publication, both the effect size and level of significance are reduced.

5.1.3. SMA and firm-level brand equity.

Another archival study is then conducted, aiming to further explore the effect of firms' SMA communication on firms' brand equity at the organizational level. Drawing on the same sample described above, I carried out a structured content analysis that incorporates both subjective and objective coding and statistically analyzed the association between firms' SMA disclosures and their brand equity as measured by Tobin's Q. This study thus provides additional evidence that firms' SMA disclosures result in higher brand equity at the organizational level. More specifically, the findings suggest that disclosing firms' engagement in first-tier SMA results in significantly higher brand equity. Additionally, there is an incremental positive effect of firms' disclosure of lower-tier SMA. The results thus align with the findings of the experimental study and further confirm the benefits of extending SMA to lower-tier suppliers.

5.2. Theoretical Implications

This research contributes to the supply chain management literature in three ways. First, the current research is, to my knowledge, the first to systematically test the effects of SMA disclosures on consumer evaluations, aggregate consumer sentiment, and firm-level brand equity. Although prior studies have provided evidence of the positive association between green supply chain management (GSCM) and firm performance (Godfrey et al., 2009; Flammer 2013; Hofmann et al., 2014; Kang et al., 2016; Busse et al., 2017), their focus has typically been on the cost-saving benefits of GSCM. Few studies have specifically examined the effects of disclosing firms' SMA practices on consumer evaluations, including purchase intent, and (perceptions of) brand equity as relevant predictors of firms' future sales performance. By examining the effects of SMA disclosures on consumer evaluations, aggregate consumer sentiment, and firm-level

brand equity, I present evidence that engaging in GSCM, and SMA, in particular, carry top-line benefits that may further contribute to greater firm performance.

Second, the present study contributes to the supplier management literature by exploring how firms' supplier management practices can affect external stakeholder perceptions, and, consequently, influence the focal firms' performance. Different from prior literature, which mostly focuses on focal firms' first-tier suppliers, this study includes both first- and lower-tier suppliers and provides a comprehensive picture regarding the effect of SMA. Results suggest first- and lower-tier SMA affects firm performance differently: the former tends to be stronger, whereas the latter tends to be incremental. Researchers in supplier management, thus, should be encouraged to include and explicitly distinguish lower-tier suppliers in future studies.

Additionally, most of the prior studies explore antecedents for focal firms to engage in sustainable supplier management (Walton et al., 1998; Schleper and Busse, 2013; Schmidt et al., 2017) and demonstrate operational and relational benefits for such engagements (Carter 2000; Thornton et al., 2013; Blome et al., 2014). The present study, instead, focuses on the performance implications of such engagement from the external stakeholders' perspective and provides empirical evidence that sustainable supplier management can yield reputational benefits for the focal firm.

Including consumers as critical external stakeholders, the third contribution of the current study is to the supply chain transparency literature. Although prior literature has demonstrated various benefits of firm transparency in supply chains, including risk mitigation, trust building, and B2B collaboration (Cheung et al., 2010; Doorey, 2011; Bell et al., 2016; Busse et al., 2017), few studies have focused specifically on SMA and incorporated the potential effects of consumers' individual attributes. This study's contribution to the supply chain transparency

literature is bolstered by exploring the effect of disclosing SMA-related issues and by the inclusion of CSR involvement as a moderator. As indicated by the findings, various SMA characteristics impact consumer evaluations differently. Also, the effect of SMA characteristic disclosures varies across consumers with differing CSR involvement levels. Therefore, as firms strive to achieve supply chain transparency during their SMA communications, it is crucial to not only understand what to disclose, but also to whom. Scholars of supply chain literature can extend the findings of the present study to other sustainable practices and identify other factors that influence the effect of firms' sustainable practice disclosures on stakeholder perceptions.

5.3. Managerial Implications

This study provides immediate and important implications for managers. This is particularly true for firms that are under pressure from various stakeholders to increase their supply chain transparency.

First, it is crucial for firms to realize that engaging in SMA is beneficial, not only because stakeholders request it, but also because such engagement can ultimately contribute to greater firm performance. Results from three empirical studies suggest that firms' SMA disclosures serve as signals, which positively affect consumer perceptions toward focal firms. Moreover, such positive perceptions carry over from the individual level to the organizational level, and ultimately influence focal firms' brand equity and reputation. Therefore, instead of passively engaging in SMA as a response to legislation (e.g., the California Transparency in Supply Chains Act) or a furious public after scandals have taken place, focal firms should actively participate in SMA. By actively engaging in and disclosing their SMA, focal firms can boost drivers of revenues such as consumer evaluations, broader consumer sentiment, and brand equity.

Second, although it is challenging for focal firms to monitor lower-tier suppliers due to constraints in location and power exertion, the findings of the present study indicate that firms should strive to go beyond first-tier suppliers in their SMA. Although prior literature provides evidence that the market punishes firms for their suppliers' failures to adhere to standards and expectations of sustainability regardless of a supplier's location along the supply chain (Hartmann and Moeller, 2014), the present study shows evidence at both the individual and organizational levels that the market rewards firms when they go the extra mile by including lower-tier suppliers in their SMA. Additionally, the results of our study provide valuable insights regarding the comparisons between the effects of first- and lower-tier SMA on firms' brand equity. Specifically, engaging in first-tier SMA tends to result in a stronger and more significant positive effect on firms' brand equity than engaging in lower-tier SMA.

Third, despite the importance of engaging in SMA, practitioners should be cautious in deciding what relevant practices to disclose and intentionally target specific consumer groups for a stronger impact. In particular, results from the individual-level experiments demonstrate that different SMA characteristics differentially influence consumer evaluations. Meanwhile, the individual factor also plays a role in affecting the the relationship between SMA disclosures and consumer evaluations. When disclosing SMA, it is critical for focal firms to communicate to what degree they engage in SMA. Knowing that focal firms monitor suppliers and extend SMA to the lower tier can enhance consumers' perceived brand equity and attitude toward firms. Nevertheless, firms should be cautious when disclosing their SMA breadth. Although disclosing SMA to a certain extent can result in higher consumer evaluations, the present study does not find evidence for incremental benefits as the breadth of engagement increases (both environmental and social SMA). Consumers might interpret that, by engaging in both SMA

dimensions, focal firms divert resources from other more important product attributes (e.g., service quality) to SMA (Luchs et al., 2010; Newman et al., 2014), and thus are less likely to positively evaluate focal firms.

Moreover, firms must be deliberate when choosing their lower-tier supplier monitoring mechanism. Results show that consumers tend to place higher value on focal firms' monitoring their lower-tier suppliers through building direct connections and maintaining high monitoring intensity compared to delegating SMA responsibilities to first-tier suppliers or a third-party organization. Hence, although prior studies find that working with a third-party organization might provide additional credibility to a firm's SMA disclosures, consumers might be more aware of potential issues that can happen at lower-tier suppliers and thus prefer focal firms build direct connections with their suppliers upstream.

Lastly, because consumers' reactions to SMA signals vary based on their CSR involvement, firms should strategically tailor their SMA communications to target specific consumer segments. This is becoming increasingly critical in sectors in which companies develop direct relationships with individual consumers through omnichannel efforts.

5.4. Limitations and Future Research

As with all empirical research, the present study has certain limitations. First, the vignette-based experiments assess consumer perceptions and intent rather than their actual purchasing behavior. Prior research (e.g., Hassan et al., 2016) provides evidence for the existence of the intention-behavior gap in ethical consumption. Hence, consumers' perceptions might not always result in consistent actual purchasing behaviors. To show consistency between consumer intention and behavior, future research should evaluate the effect of SMA disclosures in the context of a field study, in which actual monetary payments are involved.

Moreover, in the sentiment analysis study, the data are collected and analyzed at the monthly level due to difficulties in pinpointing the exact publication dates of the focal firms' CSR reports. Although this shortfall can be mitigated with the results from the individual level experiments, future research can overcome this shortcoming and provide more granularity by conducting an event study and examining changes in consumer sentiment in the days or weeks surrounding CSR report publication.

Lastly, the present study is limited to two industries that are subject to high stakeholder pressure (i.e., electronics and food manufacturing), which may limit the generalizability of the findings. It is conceivable that consumers might react differently to firms' SMA disclosures in industries that are not under high stakeholder pressure. Scholars, as well as managers across various industries, could benefit from future research examining the effects of SMA disclosures across a broader array of industries.

Although the previously mentioned limitations need to be addressed in future research, they do not discredit the findings of the current study. Instead, the results of the current study serve as a foundation to build upon for scholars who are interested in the effect of supply chain transparency and SMA.

6. REFERENCES

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7. TABLES AND FIGURES

Table 1.1. Approaches to minimize potential M-Turk concerns

Potential concerns	Description of concern	My approaches
Character misrepresentation	Character misrepresentation occurs when a respondent deceitfully claims an identity, ownership, or behavior in order to qualify and be paid for completing a survey or a behavioral research study. (Wessling et al., 2017 p. 211)	<ul style="list-style-type: none"> • Did not specify demographic characteristics to qualify for our sample (Wessling et al., 2017)
Non-naïve participants	Participants behave differently in studies due to prior exposure to experimental materials (Chandler et al., 2015).	<ul style="list-style-type: none"> • The between-subject design and subtle manipulation prevent participants from guessing the purpose of the research.
Selective attrition	Participants are self-selecting to opt out of an experiment for reasons related to the condition they were assigned to. (Zhou and Fishbach, 2016)	<ul style="list-style-type: none"> • Asked every participant to formally “Accept” before accessing the study (Peer et al., 2012; Goodman and Paolacci, 2017)
Self-selection bias	Participants are free to select the tasks they participate in. (Goodman and Paolacci, 2017)	<ul style="list-style-type: none"> • Adopted a generic study description and described our study as “An E-commerce Task.” Did not provide much detail except for asking participants to imagine shopping for a laptop online. (Goodman and Paolacci, 2017)
Inattentive respondents	Respondents are not paying close attention to the experiment’s instructions. (Peer et al., 2014)	<ul style="list-style-type: none"> • Included an attention check questions to screen out inattentive respondents or to increase the attention of respondents (Peer et al., 2014) • Included quality filter and only recruited workers with above 95% approval rate. (Peer et al., 2014)

Table 1.2. Experimental design and demographic information of studies

		Study 1: SMA mere disclosure		Study 2: SMA dimension		Study 3: SMA depth		Study 4: SMA mechanism	
Final Sample Size		195		348		185		238	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender	Female	71	36%	206	59%	118	64%	71	30%
	Male	124	64%	142	41%	67	36%	167	70%
Race	White	107	55%	218	63%	118	64%	136	57%
	African American	7	4%	19	5%	11	6%	9	4%
	Hispanic	6	3%	9	3%	5	3%	6	3%
	Asian	71	36%	92	26%	48	26%	84	35%
	Others	4	2%	10	3%	3	2%	3	1%
Education	Less than high school	0	0%	3	1%	1	1%	0	0%
	High school	16	8%	32	9%	20	11%	15	6%
	Some college	31	16%	57	16%	32	17%	37	16%
	2-year college	16	8%	28	8%	24	13%	24	10%
	4-year college	86	44%	169	49%	84	45%	125	53%
	Master degree	46	24%	57	16%	19	10%	34	14%
	Ph.D.	0	0%	1	0%	1	1%	2	1%
Others	0	0%	1	0%	4	2%	1	0%	
Income	Under 20,000	35	18%	63	18%	34	18%	38	16%
	20,000-29,999	37	19%	48	14%	25	14%	40	17%
	30,000-39,999	23	12%	48	14%	25	14%	32	13%
	40,000-49,999	14	7%	29	8%	23	12%	24	10%
	50,000-59,999	16	8%	40	11%	25	14%	21	9%
	60,000-69,999	16	8%	37	11%	10	5%	11	5%
	70,000 +	54	28%	83	24%	43	23%	72	30%
Age	Under 15	0	0%	0	0%	0	0%	0	0%
	15-24	10	5%	8	2%	6	3%	18	8%
	25-34	82	42%	164	47%	79	43%	114	48%
	35-44	64	33%	46	13%	60	32%	55	23%
	45-54	29	15%	19	5%	31	17%	35	15%
	55 +	10	5%	5	1%	9	5%	16	30%

Table 1.3. Study 1: SMA mere disclosure scenarios

SMA mere disclosure	
SMA information disclosure	No SMA information disclosure
<p>We hope to exert influence over the supply chain to lead our suppliers to comply with our code of conduct.</p> <p>Our supplier code of conduct sets forth our commitment to integrity and compliance within its global supply chain.</p> <p>We carefully monitor supplier environmental practices such as:</p> <ul style="list-style-type: none"> • Carbon footprint • Energy and water consumption • Waste recycling <p>Also, we carefully monitor supplier social practices such as:</p> <ul style="list-style-type: none"> • Diversity • Human rights protection • Community service engagement <p>We monitor processes and materials with our suppliers to make our products as sustainable as economically and technically possible.</p>	N/A

Table 1.4. Study 1: Descriptive statistics

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
1. SMA mere disclosure	0	1	0.44	0.50	1	.24**	.11	.02
2. Attitude toward the firm	1	7	5.36	5.36		1	.74**	.48**
3. Overall perceived brand equity	1	7	4.24	4.24			1	.38**
4. CSR involvement	1	7	5.34	5.34				1

Note: *** $p < .01$

Table 1.5. Study 2: SMA breadth disclosure scenarios

SOC	ENV	With	Without
With		We carefully monitor supplier environmental practices such as: <ul style="list-style-type: none"> •Carbon footprint •Energy and water consumption •Waste recycling Also, we carefully monitor supplier social practices such as: <ul style="list-style-type: none"> •Diversity •Human rights protection •Community service engagement 	We carefully monitor supplier social practices such as: <ul style="list-style-type: none"> • Diversity • Human rights protection • Community service engagement
Without		We carefully monitor supplier environmental practices such as: <ul style="list-style-type: none"> • Carbon footprint • Energy and water consumption • Waste recycling 	N/A

Table 1.6. Study 2: Descriptive statistics

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
1. SMA breadth information	1	4	2.43	1.17	1	.17**	.13*	.07
2. Attitude toward the firm	1	7	5.47	1.29		1	.72**	.44**
3. Overall perceived brand equity	1	7	4.36	1.31			1	.41**
4. CSR involvement	1	7	5.42	1.25				1

Note: *** $p < .01$

Table 1.7. Regression result for Study 2

Dependent variable: attitude toward the firm				
	Control model		Interaction	
	<i>Estimate</i>	<i>Std. error</i>	<i>Estimate</i>	<i>Std. error</i>
Constant	6.07***	0.42	5.92***	0.39
Age	-0.22***	0.07	-0.17**	0.06
Gender	0.08	0.14	-0.18	0.13
Education	0.05	0.06	0.01	0.05
Income	-0.20	0.20	0.00	0.02
CSR involvement			0.60***	0.10
D ₁			0.50***	0.14
D ₂			0.67***	0.16
D ₁ x CSR involvement			-0.31**	0.12
D ₂ x CSR involvement			-0.08	0.14
N	368		368	
Adjusted R²	0.04		0.26	
F-statistics	3.79 (df = 4, 363)		13.83 (df = 9, 358)	
Dependent variable: overall perceived brand equity				
	Control model		Interaction	
	<i>Estimate</i>	<i>Std. error</i>	<i>Estimate</i>	<i>Std. error</i>
Constant	5.32***	0.51	5.29***	0.44
Age	-0.29***	0.08	-0.21**	0.07
Gender	0.19	0.17	-0.19	0.15
Education	0.11	0.07	0.05	0.06
Income	-0.03	0.02	-0.00	0.02
CSR involvement			0.83***	0.12
D ₁			0.54***	0.16
D ₂			0.54**	0.19
D ₁ x CSR involvement			-0.29**	0.14
D ₂ x CSR involvement			-0.14	0.16
N	368		368	
Adjusted R²	0.04		0.35	
F-statistics	5.14 (df = 4, 363)		21.34 (df = 9, 358)	

Table 1.8. Regression result for Study 2 with four conditions

Dependent variable: attitude toward the firm				
	Control model		Interaction	
	<i>Estimate</i>	<i>Std. error</i>	<i>Estimate</i>	<i>Std. error</i>
Constant	6.07***	0.42	2.75***	0.68
Age	-0.22***	0.07	-0.17***	0.06
Gender	0.08	0.14	-0.18	0.13
Education	0.05	0.06	0.01	0.05
Income	-0.20	0.20	0.00	0.02
CSR involvement			0.58***	0.11
D ₁			2.11***	0.75
D ₂			2.09***	0.77
D ₃			1.07	0.75
D ₁ x CSR involvement			-0.29**	0.14
D ₂ x CSR involvement			-0.29**	0.14
D ₃ x CSR involvement			-0.07	0.14
N	368		368	
Adjusted R²	0.04		0.26	
F-statistics	3.79 (df = 4, 363)		11.26 (df = 11, 356)	

Table 1.9. Study 3: SMA depth disclosure scenarios

SMA depth disclosure	
Contextual information:	
The complex nature of the computers means that the supply chain is also very complex, consisting of a huge variety of different materials. This complexity means it is not only the Tier 1 (direct) supplier who is involved in material compliance, but compliance must be assured throughout the supply chain by including lower-tier suppliers.	
First-tier SMA only	First- and lower-tier SMA
We do not have any direct purchasing relationship with lower-tier suppliers and only monitor our Tier 1 (direct) suppliers due to due to the lack of contractual leverage and visibility.	Hence, we monitor our Tier 1 (direct) suppliers as well as lower-tier suppliers.

Table 1.10. Study 3: Descriptive statistics

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
1. SMA depth information	0	1	0.50	0.50	1	.34**	.26**	(.02)
2. Attitude toward the firm	1	7	4.85	1.38		1	.75**	.15**
3. Overall perceived brand equity	1	7	3.97	1.40			1	.23**
4. CSR involvement	1	7	5.49	1.18				1

Note: *** $p < .01$

Table 1.11. Regression result for Study 3

Dependent variable: perceived brand equity						
	Control model		Main effect		Interaction	
	<i>Estimate</i>	<i>Std. error</i>	<i>Estimate</i>	<i>Estimate</i>	<i>Estimate</i>	<i>Std. error</i>
Constant	5.55	0.66	3.07***	0.78	5.25***	0.59
Age	-0.46	0.12	-0.42***	0.11	-0.43***	0.11
Gender	-0.17	0.25	-0.10	0.23	-0.09	0.22
Education	0.22	0.09	0.26***	0.09	0.27***	0.09
Income	-0.15	0.06	-0.17**	0.05	-0.17***	0.05
CSR involvement			0.28***	0.09	0.29**	0.09
SMA depth			1.24***	0.21	1.24***	0.21
CSR involvement x SMA depth					0.30*	0.18
N	185		185		185	
Adjusted R²	0.10		0.26		0.30	
F-statistics	5.75 (df = 4, 180)		11.98 (df = 6, 178)		10.77 (df = 7, 177)	

Table 1.12. SMA lower-tier supplier monitoring mechanism disclosure scenarios

The lower-tier supplier monitoring mechanism disclosure		
Contextual information: Featured brands: Eco-friendly companies that strive for transparency “The complex nature of the products means that the supply chain is also very complex, consisting of a huge variety of different materials used in products. This complexity means it is not only the Tier 1 supplier who is involved in material compliance, but compliance must be assured throughout the supply chain.”		
Direct monitoring	Indirect monitoring	3rd-party organization monitoring
Audits are an important tool in examining suppliers’ adherence to expectations. Our on-site audits include: • Interview with factory managers and workers • Health and safety inspection	Our Tier 1 suppliers monitor their subcontractors on our behalf. Specifically, our Tier 1 suppliers must: • Make sure their sub-contractors comply with our code of conduct • Disclose the name of all their sub-contractors	We require our Tier 1 and lower-tier suppliers to undergo Electronic Industry Citizenship Coalition (EICC)-certified third-party audits. The suppliers must: • Undergo a full audit once every two years • Conduct as many follow-ups as necessary

Table 1.13. Study 3: Descriptive statistics

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
1. Lower-tier supplier monitoring mechanism	1	3	2.01	0.83	1	.11	.17**	.02
2. Attitude toward the firm	2.33	7	5.62	1.09		1	.70**	.35**
3. Overall perceived brand equity	1.6	7	4.57	1.30			1	.34**
4. CSR involvement	1	7	5.51	1.23				1

Note: *** $p < .01$

Table 1.14. Regression result for Study 4

Dependent variable: attitude toward the firm				
	Control model		Interaction	
	<i>Estimate</i>	<i>Std. error</i>	<i>Estimate</i>	<i>Std. error</i>
Constant	5.81***	0.43	5.88***	0.41
Age	-0.13**	0.07	-0.11*	0.06
Gender	0.10	0.16	-0.01	0.15
Education	0.05	0.06	0.02	0.06
Income	-0.01	0.02	-0.00	0.02
CSR involvement			0.17*	0.10
D ₁			0.02	0.17
D ₂			0.27*	0.16
D ₁ x CSR involvement			0.25*	0.14
D ₂ x CSR involvement			0.18	0.13
N	238		238	
Adjusted R²	0.02		0.16	
F-statistics	1.18 (df = 4, 233)		4.75 (df = 9, 228)	

Table 1.15. Result summary

Study	Hypothesis	Independent variable	Support?
1	1	Mere disclosure	Yes
	4	Mere disclosure x CSR involvement	No
2	2a	SMA breadth	Yes Disclosing SMA dimension information leads to higher evaluation than no SMA dimension disclosure; no additional increase by disclosing from both dimensions.
	5a	SMA breadth x CSR involvement	Yes
3	2b	SMA depth	Yes
	5b	SMA depth x CSR involvement	Partially supported (overall perceived brand equity)
4	3a, 3b	SMA lower-tier supplier monitoring mechanism	Hypothesis 3a is supported
	5c, 5d	SMA lower-tier supplier monitoring mechanism x CSR involvement	Hypothesis 5a is partially supported (attitude toward the firm)

Table 2.1. Data construction and cleaning process

Step	Procedure	Reduction	# of firms	# of firm/year observations
1	Public firms that start with 334 and 311 in Compustat that are active from 2012-2017		625	3,125
2	Firms in the list that published CSR reports from 2012-2016 period	2,814	100	311
3	Firms that do not have missing values	44	99	268

Table 2.2. Variable definition and operationalization

	Variables	Data sources	Periodicity	Explanation
Dependent variable	<i>Tobin's Q</i>	Compustat	Quarter	Proxy variable for firms' brand equity
	Δ <i>Tobin's Q</i>	Compustat	Quarter	
	<i>Mean analyst estimate</i>	Thomson Reuters I/B/E/S	Quarter	Variable indicating average analysts' sales estimates one quarter after firms' CSR reports are published
Control variables	<i>Electr. products mfg.</i>	Compustat		Binary variable identifying firms in electronic products manufacturing industry
	<i>R&D Intensity</i>	Compustat	Quarter	Research and development expenses/Total revenue
	<i>Advertising Intensity</i>	Compustat	Annual	Advertising expenditure/Total revenue
	<i>Total Assets</i>	Compustat	Quarter	Common logarithm of total assets (proxy firm size)
Independent variables	<i>First-tier SMA</i>	Content analysis (CSR reports)	Annual	Binary variable indicating whether the firm engages in any first-tier supplier monitoring activities
	<i>Lower-tier SMA</i>	Content analysis (CSR reports)	Annual	Binary variable indicating whether the firm engages in any lower-tier supplier monitoring activities

Table 2.3. Descriptive statistics and correlation matrix

Variables	Mean	Standard deviation	1	2	3	4	5	6	7	8
1 Tobin's $Q_{(t)}$	1.35	1.29	1							
2 Tobin's $Q_{(t-1)}$	1.34	1.22	0.85	1						
3 Electronic prod. mfg.	0.72	0.45	-0.11	-0.15	1					
4 R&D Intensity	0.20	0.37	-0.05	0.15	0.32	1				
5 Advertising Intensity	0.01	0.02	0.33	0.34	-0.43	-0.15	1			
6 Total Assets	22998.72	38627.48	0.04	0.04	0.08	-0.04	0.03	1		
7 First-tier SMA	0.61	0.49	-0.07	-0.12	0.17	-0.04	-0.04	0.20	1	
8 Lower-tier SMA	0.18	0.38	-0.16	-0.15	0.26	0.12	-0.15	0.15	0.36	1

Correlation coefficients significant at $p < 10\%$ are printed in bold.

Table 2.4. Estimation results (Feasible generalized least squares) ($N = 248$)

	Tobin's $Q_{i,t}$	
	Model 1 <i>Coef.</i>	Model 2 <i>Coef.</i>
Intercept	0.66 (0.06)***	0.62 (0.05)***
Elect. products mfg.	0.31 (0.01)***	0.31 (0.01)***
Tobin's Q_{t-1}	0.92 (0.01)***	0.91 (0.01)***
\log_{10} (TotalAssets)	-0.15 (0.02)***	-0.15 (0.01)***
R&D Intensity	-0.79 (0.03)***	-0.75 (0.03)***
Advertising Intensity	3.04 (0.37)***	3.40 (0.42)***
First-tier SMA		0.05 (0.01)***
Lower-tier SMA		0.02 (0.01)*
Model statistics		
Wald Chi-squared	59,201.08***	32,764.75***

Std. errors are shown in parentheses

*** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level

Table 2.5. Robustness tests with alternative dependent variables (FGLS)

	$\Delta Q_{i,t}$		$\log_{10}(\text{Mean analyst sales estimate})_{i,t}$	
	Model 3 <i>Coef.</i>	Model 4 <i>Coef.</i>	Model 5 <i>Coef.</i>	Model 6 <i>Coef.</i>
Intercept	0.46 (0.07)***	0.42 (0.05)***	0.06 (0.01)***	0.07 (0.02)***
Electr. products mfg.	0.29 (0.01)***	0.27 (0.01)***	-0.01 (0.01)	-0.01 (0.01)*
Log ₁₀ (TotalAssets)	-0.12 (0.02)***	-0.12 (0.01)***	0.02 (0.01)**	0.02 (0.01)**
R&D Intensity	-0.80 (0.03)***	-0.75 (0.03)***	0.02 (0.01)*	0.01 (0.01)
Advertising Intensity	1.39 (0.24)***	1.55 (0.34)***	-0.09 (0.06)	-0.07 (0.08)
First-tier SMA		0.05 (0.01)***		0.01 (0.00)**
Lower-tier SMA		0.06 (0.05)***		0.00 (0.00)
Lagged DV			0.97 (0.01)***	0.96 (0.01)***
Model statistics				
N	248	248	79	79
Wald Chi-squared	911.30***	10,211.95 ***	123,996.63 ***	81,249.20 ***

Std. errors are shown in parentheses

*** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level

Table 3.1. Data construction and cleaning process

Step	Procedure	Reduction	# of firms	# of firm/year observations
1	Public firms that start with 334 and 311 in Compustat that are active from 2012-2017		625	3,125
2	Firms in the list that published CSR reports from 2012-2016 period	2,814	100	311
3	Firms that do not have missing values	44	99	267

Table 3.2. Descriptive statistics and correlation matrix ($N = 268$)

		Mean	SD	1	2	3	4	5	6	7	8	9	10
1	AFINN _{normalized it}	0.05	0.97	1									
2	AFINN _{normalized it-1}	0.03	0.98	0.48	1								
3	Return on Assets _{it}	0.02	0.03	-0.02	0.08	1							
4	Sales growth _{it}	0.02	0.13	0.04	0.02	0.27	1						
5	Revenue _{it}	4542.93	8203.41	0.03	-0.20	0.15	0.15	1					
6	Electr. prod. mfg.	0.71	0.46	0.03	0.00	-0.14	-0.10	-0.02	1				
7	R&D intensity _{it}	0.21	0.37	-0.13	-0.09	-0.36	-0.20	-0.11	0.33	1			
8	Adv. intensity _{it}	0.01	0.02	0.14	0.07	0.08	0.18	0.03	-0.41	-0.15	1		
9	First-tier SMA _{it}	0.62	0.49	0.13	-0.00	0.01	-0.04	0.17	0.17	-0.03	-0.04	1	
10	Lower-tier SMA _{it}	0.17	0.37	0.05	0.06	0.03	0.01	0.11	0.27	0.12	-0.13	0.33	1

Correlation coefficients significant at $p < 10\%$ are printed in bold.

Table 3.3. Feasible generalized least squares estimation results ($N = 268$)

	AFINN _{normalized it}		AFINN _{normalized it+1}	
	Model 1 Coef.	Model 2 Coef.	Model 3 Coef.	Model 4 Coef.
Intercept	-1.22 (0.15)***	-1.22 (0.14)***	0.08 (0.21)	0.03 (0.22)***
AFINN _{normalized it-1}	0.49 (0.02)***	0.48 (0.03)***	0.60 (0.03)***	0.60 (0.03)
Return on assets _{it}	-4.52 (1.17)***	-3.24 (1.14)***	1.58 (1.46)	1.40 (1.45)
Sales growth _{it}	0.39 (0.21)*	0.39 (0.23)*	0.02 (0.22)	0.02 (0.21)
Log ₁₀ Revenue _{it}	0.34 (0.04)***	0.33 (0.04)***	-0.03 (0.06)	-0.01 (0.06)
Electr. products mfg.	0.30 (0.05)***	0.16 (0.05)***	-0.01 (0.06)	0.04 (0.06)
R&D intensity _{it}	-0.26 (0.10)***	-0.14 (0.10)	-0.07 (0.12)	-0.09 (0.13)
Advertising intensity _{it}	7.24 (1.19)***	6.25 (1.42)***	1.89 (1.37)	2.01 (1.31)
First-tier SMA _{it}		0.22 (0.05)***		-0.03 (0.05)
Lower-tier SMA _{it}		-0.08 (0.07)		-0.02 (0.09)
Previous month dependent variable included?	Yes	Yes	Yes	Yes
Wald Chi2	838.53***	691.33***	402.38***	405.57***

Std. errors are shown in parentheses

*** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level.

Table 3.4. Robustness test with alternative dependent variable and estimation method ($N = 268$)

	Alternative dependent variable		Different estimation method	
	Polarity _{normalized it}		GEE estimator	
	Model 5 <i>Coef.</i>	Model 6 <i>Coef.</i>	Model 7 <i>Coef.</i>	Model 8 <i>Coef.</i>
Intercept	0.27 (0.08)***	0.31 (0.08)***	-0.91 (0.32)***	-0.94 (0.33)***
Lagged DV	0.38 (0.04)***	0.53 (0.02)***	0.45 (0.05)***	0.42 (0.05)***
Return on assets _{it}	-0.24 (0.38)	-0.12 (0.38)	-4.46 (1.76)**	-4.29 (1.74)**
Sales growth _{it}	0.24 (0.09)***	0.28 (0.08)***	0.10 (0.39)	0.25 (0.39)
Log ₁₀ Revenue _{it}	-0.06 (0.02)***	-0.08 (0.02)***	0.27 (0.09)***	0.24 (0.10)**
Electr. products mfg.	-0.03 (0.02)	-0.04 (0.02)	0.23 (0.14)	0.20 (0.15)
R&D intensity _{it}	-0.08 (0.03)**	-0.07 (0.03)**	-0.26 (0.15)*	-0.24 (0.15)
Advertising intensity _{it}	1.99 (1.08)*	1.27 (1.08)	5.11 (3.17)	4.37 (3.26)
First-tier SMA _{it}		0.03 (0.01)**		0.26 (0.11)**
Lower-tier SMA _{it}		0.03 (0.03)		-0.22 (0.14)
Wald Chi2	109.20***	1218.11***	94.48***	93.15***

Std. errors are shown in parentheses

*** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level.

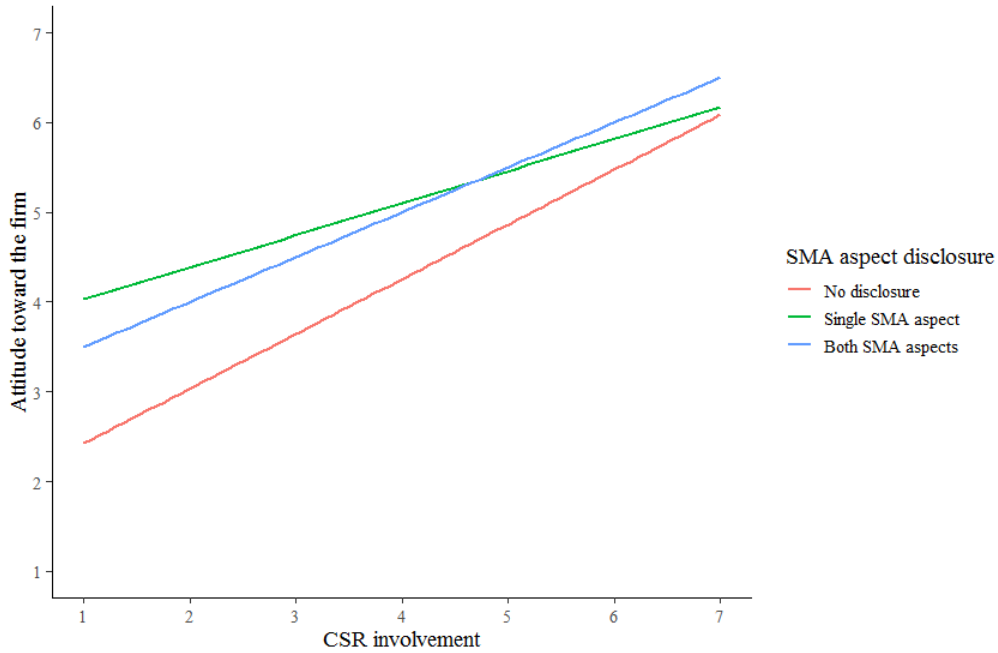


Figure 1.1. Interaction of CSR involvement and SMA breadth disclosure on attitude toward the firm

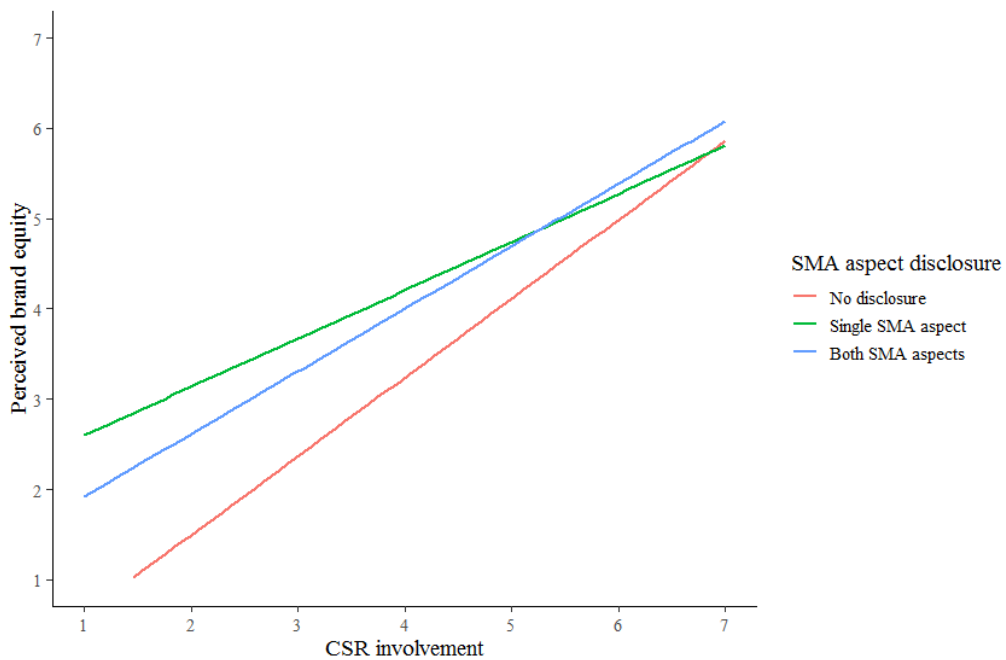


Figure 1.2. Interaction of CSR involvement and SMA breadth disclosure on perceived brand equity

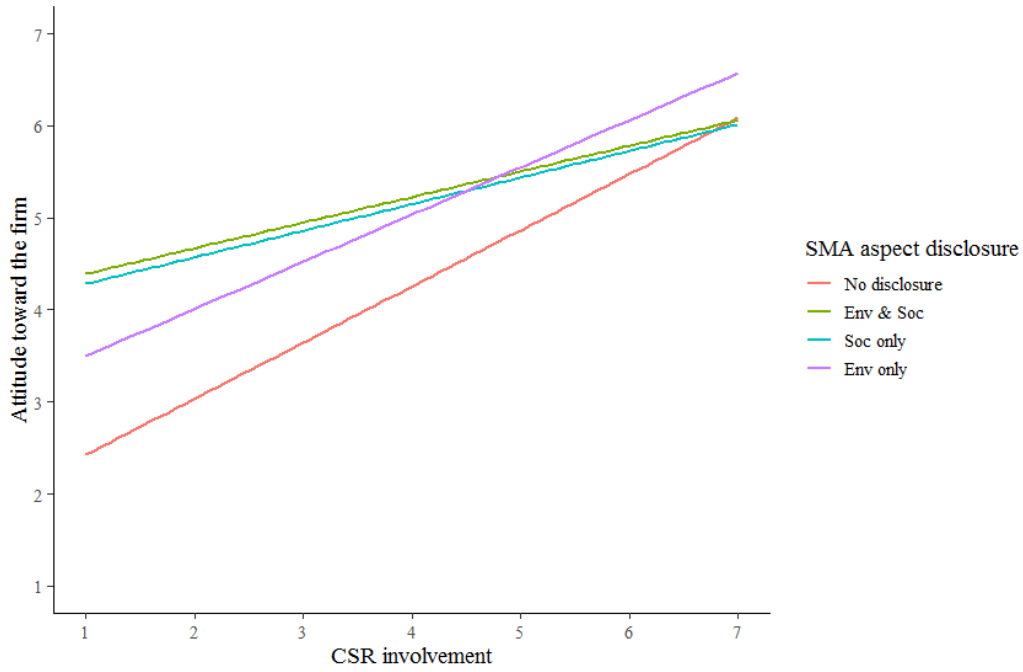


Figure 1.3. Interaction of CSR involvement and SMA breadth (four conditions) disclosure on attitude toward the firm

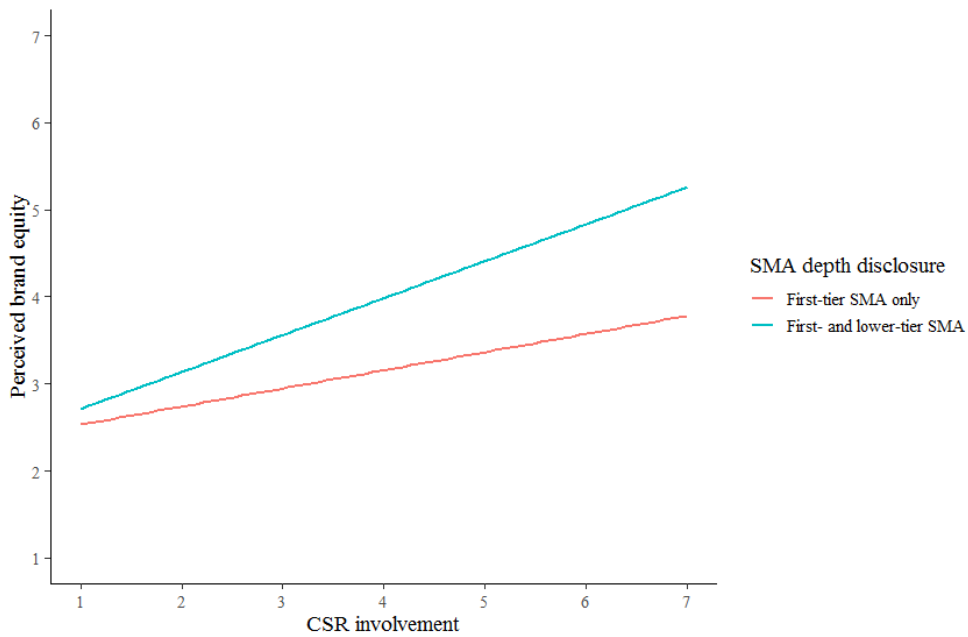


Figure 1.4. Interaction of CSR involvement and SMA depth information disclosure on perceived brand equity

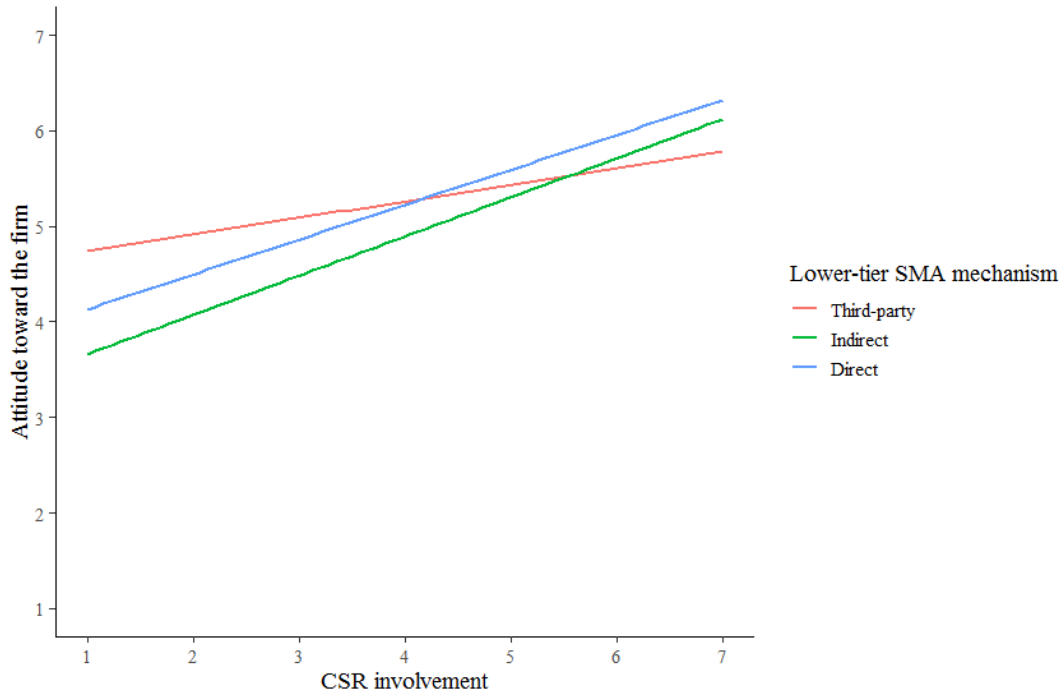


Figure 1.5. Interaction of CSR involvement and SMA lower-tier supplier monitoring mechanism disclosure on attitude toward the firm

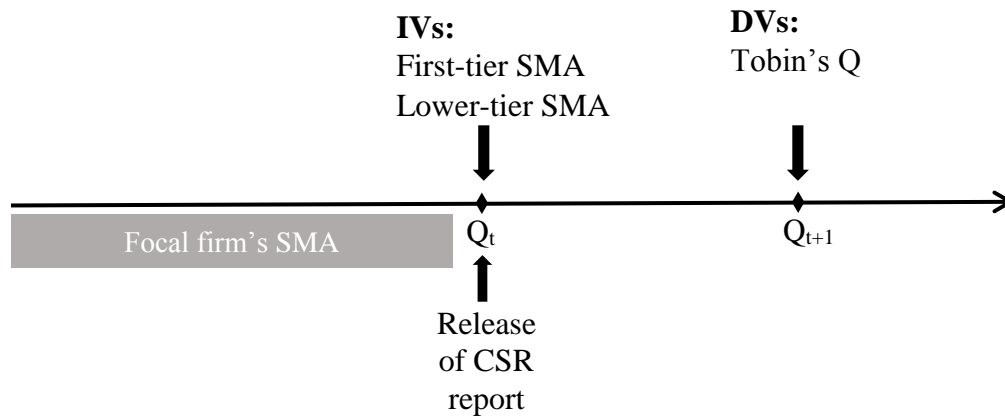


Figure 2.1. Temporal sequencing of variable measurements

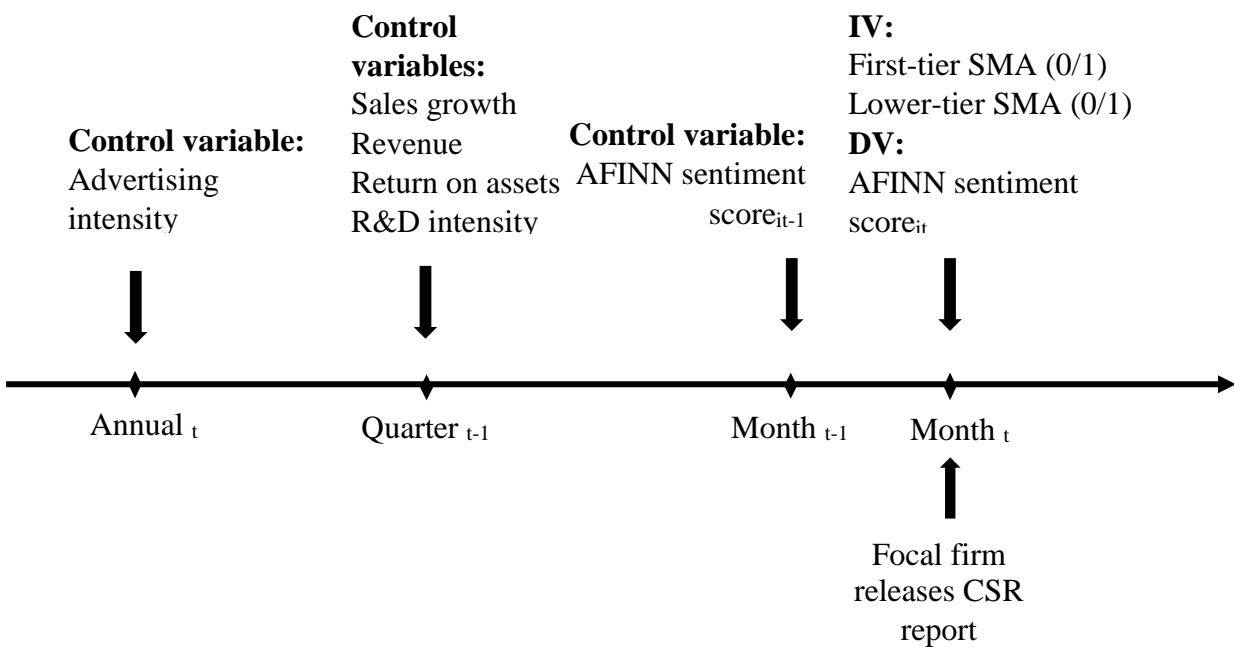


Figure 3.2. Temporal sequencing of variable measurements



8. APPENDIX

1.A. Measurement of variables


Measure	Adopted from	Item Description	Anchors	Alpha
Attitude toward the firm	Burton et al. (1994)	Att1-3: What is your overall attitude towards company A?	1= Very Unfavorable; 7= Very Favorable 1= Bad; 7= Good 1= Negative; 7= Positive	.96
Overall perceived brand equity	Yoo and Donthu, 2001	PBE1: It makes sense to buy [Brand X] instead of any other brand, even if they are the same. PBE2: Even if another brand has the same features as [Brand X], I would prefer to buy [Brand X]. PBE3: If there is another brand as good as [Brand X], I prefer to buy [Brand X]. PBE4: If another brand is not different from [Brand X] in any way, it seems smarter to purchase [Brand X].	1= Strongly Disagree; 7= Strongly Agree	.94
CSR involvement	Savitz and Weber (2006)	CSR1: I am concerned about the pollutants emitted. CSR2: I am concerned about the recycling and reuse. CSR3: I am concerned about the product responsibility. CSR4: I am concerned about the carbon footprint. CSR5: I am concerned about the product impacts. CSR6: I am concerned about people's health and safety record. CSR7: I am concerned about community impacts. CSR8: I am concerned about human rights and privacy. CSR9: I am concerned about product responsibility. CSR10: I am concerned about employee relations.	1= Strongly Disagree; 7= Strongly Agree	.96

1.B. Stimulus for Study 1 (SMA mere disclosure: disclosed)

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Review

From the company

We hope to exert influence over the supply chain to lead our suppliers to comply with our code of conduct. Our supplier code of conduct sets forth our commitment to integrity and compliance within its global supply chain.

We carefully monitor supplier environmental practices such as:

- Carbon footprint
- Energy and water consumption
- Waste recycling

Also, we carefully monitor supplier social practices such as:

- Diversity
- Human rights protection
- Community service engagement

We monitor processes and materials with our suppliers to make our products as sustainable as economically and technically possible.

Frequently bought together

Stimulus for Study 1 (SMA mere disclosure: non-disclosed)

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1.C. Stimulus for Study 2 (SMA dimension: social dimension only)

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Review

From the company

We hope to exert influence over the supply chain to lead our suppliers to comply with our code of conduct. Our supplier code of conduct sets forth our commitment to integrity and compliance within its global supply chain.

We carefully monitor supplier social practices such as:

- Diversity
- Human rights protection
- Community service engagement

We monitor processes and materials with our suppliers to make our products as sustainable as economically and technically possible.

Frequently bought together

Stimulus for Study 2 (SMA dimension: environmental dimension only)

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From the company

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We hope to exert influence over the supply chain to lead our suppliers to comply with our code of conduct. Our supplier code of conduct sets forth our commitment to integrity and compliance within its global supply chain.

We carefully monitor supplier environmental practices such as:

- Carbon footprint
- Energy and water consumption
- Waste recycling

We monitor processes and materials with our suppliers to make our products as sustainable as economically and technically possible.

1.D. Stimulus for Study 3 (SMA depth: first-tier SMA only)

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Review

From the company

Frequently bought together

The complex nature of the computers means that the supply chain is also very complex, consisting of a huge variety of different materials. This complexity means it is not only the Tier 1 (direct) supplier who is involved in material compliance, but compliance must be assured throughout the supply chain by including lower-tier suppliers.

We do not have any direct purchasing relationship with lower-tier suppliers and only monitor our Tier 1 (direct) suppliers due to the lack of contractual leverage and visibility.

Stimulus for Study 3 (SMA depth: first- and lower-tier SMA)

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Review

From the company

Frequently bought together

The complex nature of the computers means that the supply chain is also very complex, consisting of a huge variety of different materials. This complexity means it is not only the Tier 1 (direct) supplier who is involved in material compliance, but compliance must be assured throughout the supply chain by including lower-tier suppliers.

Hence, we monitor our Tier 1 (direct) suppliers as well as lower-tier suppliers.

1.E. Stimulus for Study 4 (lower-tier SMA mechanism: direct monitoring)

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"The complex nature of the products means that the supply chain is also very complex, consisting of a huge variety of different materials used in products. This complexity means it is not only the Tier 1 supplier who is involved in material compliance, but compliance must be assured throughout the supply chain."



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From the company

Frequently bought together

Audits are an important tool in examining suppliers' adherence to expectations.

Our on-site audits include:

- Interviews with factory managers and workers
- Health and safety inspections

Stimulus for Study 4 (lower-tier SMA mechanism: indirect monitoring)

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"The complex nature of the products means that the supply chain is also very complex, consisting of a huge variety of different materials used in products. This complexity means it is not only the Tier 1 supplier who is involved in material compliance, but compliance must be assured throughout the supply chain."



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From the company

Frequently bought together

Our Tier 1 suppliers monitor their subcontractors on our behalf.

Specifically, our Tier 1 suppliers must:

- Disclose the name of all their sub-contractors
- Make sure their sub-contractors comply with our code of conduct

Stimulus for Study 4 (lower-tier SMA mechanism: 3rd-party organization monitoring)

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“The complex nature of the products means that the supply chain is also very complex, consisting of a huge variety of different materials used in products. This complexity means it is not only the Tier 1 supplier who is involved in material compliance, but compliance must be assured throughout the supply chain.”



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From the company

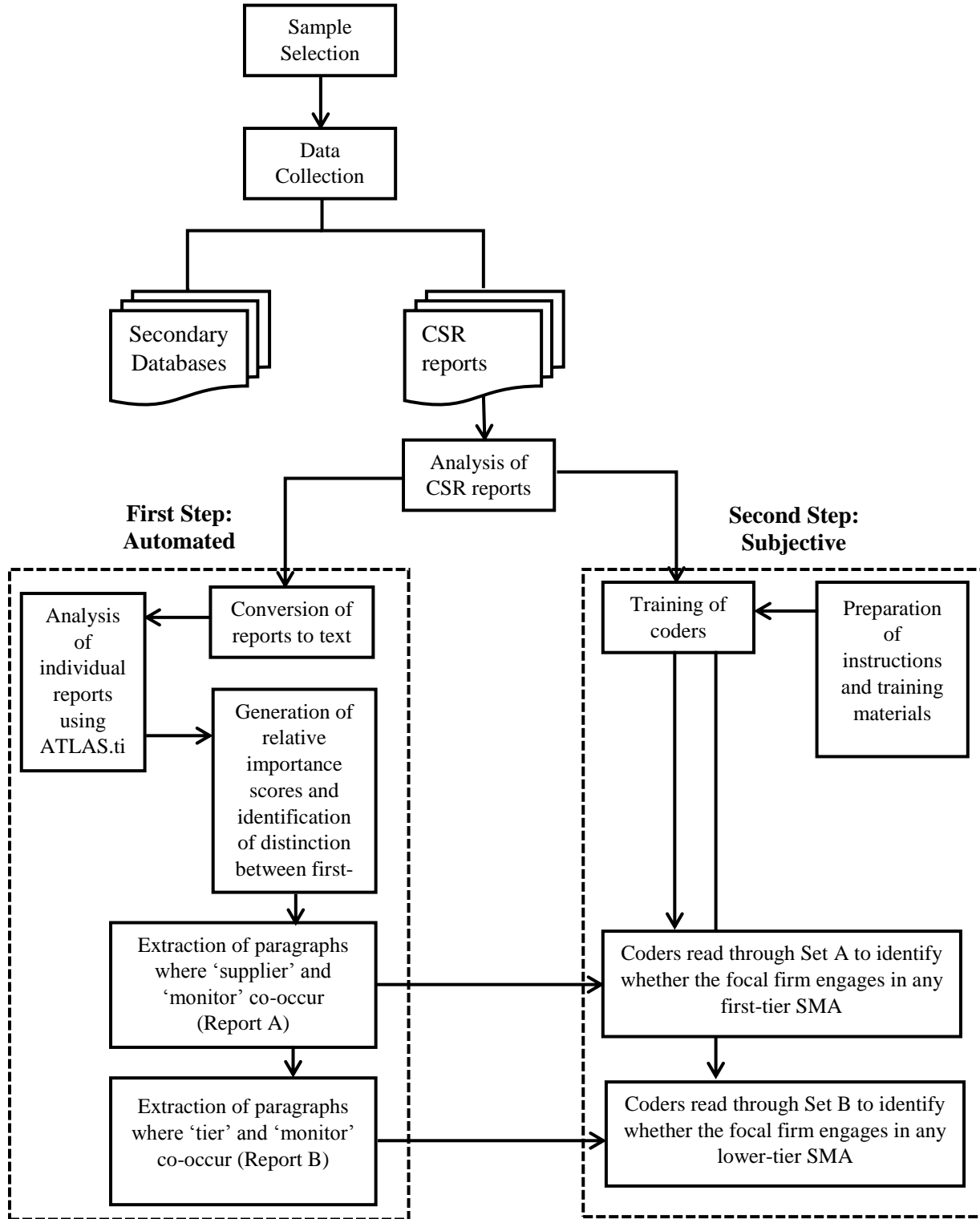
Frequently bought together

We require our Tier 1 and lower-tier suppliers to undergo Electronic Industry Citizenship Coalition (EICC)-certified third-party audits.

The suppliers must:

- Undergo a full audit once every two years
- Conduct as many follow-ups as necessary

2.A. Overview of content analysis procedure.



2.B. List of the SMA keywords

Activities	Search Terms	Explanation
Supplier	<ul style="list-style-type: none"> • Vendor • Sourc • Purchas • Procur 	Does the company disclose about its suppliers?
Monitoring	<ul style="list-style-type: none"> • Audit • Monitor 	Does the company conduct any type of supplier monitoring activity?
Tier	<ul style="list-style-type: none"> • Tier • Subcontract 	Does the company explicitly distinguish between the suppliers that it directly works with (first-tier suppliers) and the suppliers' suppliers (lower-tier suppliers)?

3.A. List of keywords for tweets extraction

	Citizen
	Common good
	Environment
	Equity
	Equitable
	Ethical
	Global
	Moral
	Planet
	Responsible
	Social
	Stewardship
	Sustain
	Audit
	Monitor
	Suppl
	Vendor

Sustainability-related keywords

Adapted from Lee et al., (2013)

SMA-related keywords