DISS. ETH NO. 25368

Managing reputation and sustainability risks in global supply chains

A thesis submitted to attain the degree of
DOCTOR OF SCIENCE of ETH ZURICH
(Dr. sc. ETH Zurich)

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2018

Acknowledgments

First of all, I would like to thank my academic advisor Prof. Dr. Stephan Wagner for the great opportunity to conduct this dissertation at his chair. He encouraged me to perform outstanding research and provided excellent expert advice. I would also like to express my appreciation to Prof. Dr. Petra Schmid for being the co-examiner of this dissertation, dedicating her time and expertise. Moreover, I would like to acknowledge Prof. Dr. Torbjörn Netland for acting as chairperson in the doctoral examination.

I would like to offer special thanks to Prof. Dr. Christian Busse who extraordinarily supported and guided all my research papers from the very beginning. His constructive thoughts and feedback raised my research to new levels. Besides, I am very grateful to Prof. Dr. Benn Lawson for hosting me as a visiting researcher at the University of Cambridge. He provided many valuable comments on my third research paper and made it possible to pretest the study with his students.

The first and second research paper of this dissertation would not have been possible without the cooperation of several industry practitioners. Therefore, I would like to thank the managers from a German technology firm for many insightful discussions and productive workshops, and for providing us access to firm-internal data. Beyond that, I would like to extend my gratitude to the guest editors and reviewers of the special topic forum “Sustainable supply chains in a digital inter-connected world” from the Journal of Business Logistics for their helpful comments and for making my first research paper available to a broader audience.

Many thanks also go to my dear colleagues from the Chair of Logistics Management for providing an exceptional work environment. I always highly appreciated the cooperative atmosphere in our team.

On a personal note, I am deeply thankful to my partner Dr. Marc Kohler, my brother Volkmar Reinerth, my parents Helmut and Christa Reinerth, and my grandmother Susanna Reinerth. They have been a constant source of support, motivation, and reflection, making me the person I am today.

Abstract

Today, buying firms are collaborating with a large number of suppliers from various countries, leading to reputation and sustainability risks in their global supply chains. These risks are prevailing due to increased stakeholder pressure, urging buying firms to consider environmental, social and governance aspects of suppliers next to economic criteria. So far, the literature on sustainable supply chain management has mostly addressed environmental aspects. Studies focusing on all aspects of reputation and sustainability jointly or on the social aspect in specific are rare. Moreover, studies considering a broader range of stakeholders are needed.

Against this background, this dissertation offers a comprehensive analysis concerning the management of reputation and sustainability risks in global supply chains covering all sustainability aspects jointly and the social aspect in specific. By considering suppliers, employees, international organizations and potential consumers, it incorporates the perspective of different stakeholders.

This dissertation builds on three empirical investigations based on country-related, firm-internal, and consumer-related data sets to provide insights on (1) how the assessment of sustainability risks at the supplier level can be informed by measures of country-level sustainability risk, (2) the extent to which a reputation for sustainable business conduct can be translated into a competitive advantage, and (3) how the characteristics of the inter-organizational relationship between the buying firm and the supplier affect the extent of negative legitimacy spillovers due to supplier misconduct. In doing so, it utilizes a stakeholder perspective and builds on institutional theory, the resource-based view, and attribution theory. The attained findings contribute to the management literature and corporate practice alike.

Zusammenfassung

Heute arbeiten Unternehmen mit einer grossen Anzahl von Lieferanten aus verschiedenen Ländern zusammen, was zu Reputations- und Nachhaltigkeitsrisiken in ihren globalen Lieferketten führt. Diese Risiken sind vor allem auf zunehmenden Druck von Stakeholdern zurückzuführen, die erwarten, dass Unternehmen neben wirtschaftlichen Kriterien auch ökologische, soziale und governance Aspekte von Lieferanten berücksichtigen. Bisher hat sich die Literatur zum nachhaltigen Management von Lieferketten hauptsächlich mit Umweltaspekten befasst. Studien, die sich auf alle Aspekte von Reputation und Nachhaltigkeit gemeinsam oder auf den sozialen Aspekt im speziellen fokussieren sind selten. Darüber hinaus sind Studien erforderlich, die ein breiteres Spektrum von Stakeholdern berücksichtigen.

Vor diesem Hintergrund bietet die vorliegende Dissertation eine umfassende Analyse zum Management von Reputations- und Nachhaltigkeitsrisiken in globalen Lieferketten, die alle Nachhaltigkeitsaspekte gemeinsam und den sozialen Aspekt im Einzelnen abdeckt. Durch die Berücksichtigung von Lieferanten, Mitarbeitern, internationalen Organisationen und potenziellen Konsumenten wird auf die Perspektive verschiedener Stakeholder eingegangen.

Diese Dissertation baut auf drei empirischen Untersuchungen basierend auf länderbezogenen, unternehmensinternen und konsumentenbezogenen Datensätzen auf, um Erkenntnisse darüber zu gewinnen wie (1) die Bewertung von Nachhaltigkeitsrisiken auf Lieferantenebene durch Nachhaltigkeitsrisikovariablen auf Länderebene unterstützt werden kann, (2) die Ausprägung einer Reputation für nachhaltige Unternehmensführung zu einem Wettbewerbsvorteil führen kann, und (3) die Eigenschaften der interorganisationalen Beziehung zwischen Unternehmen und Lieferant das Ausmass von negativem Legitimitätsübergreifen aufgrund von Lieferantenfehlverhalten beeinflussen. Dabei nutzt sie die Stakeholder-Perspektive und baut auf der Institutionstheorie, der ressourcenorientierten Sichtweise und der Attributionstheorie auf. Die gewonnenen Erkenntnisse tragen zur sowohl zur Managementliteratur als auch zur Unternehmenspraxis bei.

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CHAPTER 1 – INTRODUCTION

1. Motivation and research objectives

In the globalized economy, production processes and service provisions often span a large number of countries. The firms along the supply chain are connected through flows of information, material, and capital (Mentzer et al., 2001). Next to the value of the product, the environmental, social and legal consequences of sourcing from different countries have to be considered (Seuring and Müller, 2008; Short and Toffel, 2010). This is the case since stakeholders might hold buying firms accountable for the unsustainable conduct of their globally located suppliers (Park-Poaps and Rees 2010; Klassen and Vereecke 2012).

The importance of having sustainable suppliers has increased for buying firms in recent years due to two reasons. First, the rise of electronic media, NGOs and consumer interest concerning sustainability, which drives buying firms to penalize unsustainable supplier behavior (Yawar and Seuring, 2017). Second, the large and increasing number of suppliers which affect the reputation of the buying firm (Höjmose et al. 2014). In this vein, Shevchenko et al. (2016) conclude that firms are in a period of change, where they incrementally balance but do not fully resolve unsustainable behavior.

In recent years, more stringent laws with respect to environmental and social regulations have been implemented in developed countries (Rajeev et al., 2017). Some firms increasingly source from developing and underdeveloped countries, where these laws do not exist or are not appropriately adhered to (Goedhuys and Sleuwaegen, 2016). Hence, management initiatives concerning sustainability have been implemented to cost-effectively and cost-efficiently fulfill stakeholder requirements, aiming for enhanced risk management with respect to reputation and sustainability in globalized supply chains (Bansal and Roth, 2000; Lintukangas et al., 2016).

Researchers call for more studies on sustainable supply chain management, which consider a broader range of stakeholders, as well as all three aspects of sustainability jointly and particularly the social aspect (Seuring and Müller, 2008; Rajeev et al., 2017). Moreover, more industry-specific studies are needed since there are pronounced differences in

sustainability requirements and sustainability performance among the industries (Rajeev et al., 2017).

With that in mind, this dissertation takes a multi-stakeholder perspective, focusing on all three aspects of sustainability jointly and on the social aspect in particular, and analyzing buying firms and suppliers specifically from the technology and food industry. Thereby, environmental, social and governance supply chain sustainability risks (SCSR) are the prime object of analysis (Schleper and Busse, 2013). Hence, the overall goal of this dissertation is to contribute towards alleviating supplier-related reputation and sustainability risks. In doing so, it addresses the following primary research question: *How can reputation and sustainability risks be managed in global supply chains?*

Given the existing prior research in sustainable supply chain management, this dissertation follows an explanatory research agenda. Therefore, a quantitative design that considers the context-sensitive nature of the guiding research question is the method of choice (Edmondson and McManus, 2007). The main part of this dissertation comprises three independent contributions (Chapters 2 to 4), which utilize three different perspectives to answer the research question stated above. To analyze whether supplier-level sustainability risks can be informed by country-level measures, Chapter 2 (Paper A) focuses on institutional theory and the development of an SCSR map. Very few studies take a supplier perspective and focus on the effects of sustainable supplier behavior (Yawar and Seuring, 2017). Hence, grounded in the resource-based view, Chapter 3 (Paper B) analyzes whether a reputation for sustainability can be a source of competitive advantage for suppliers. Finally, Chapter 4 (Paper C) scrutinizes the boundary conditions of negative legitimacy spillovers in buyer-supplier relationships by employing attribution theory.

Overall, this dissertation merges the research stream on supply chain risk management with the literature on supplier sustainability and supplier reputation in buyer-supplier relationships. In a broader context, it also contributes to the understanding of inter-organizational legitimacy spillovers.

2. Reputation and sustainability risks as a threat to global supply chains

Companies have increasingly been managing not only their own sustainability performance but are also trying to manage the sustainability performance of their suppliers (Govindan et al., 2013). This is necessary since unsustainable supplier behavior can increase the risk of adverse

sustainability-related incidents, either immediately (e.g., contamination of water supply) or cumulatively (e.g., climate change due to greenhouse gas emissions) (Hartmann and Möller, 2014), resulting in negative stakeholder reactions and, therefore, in financial losses.

Two complementing strategies can be used for dealing with sustainability issues along the supply chain, namely ‘‘supplier management for risks and performance’’ and ‘‘supply chain management for sustainable products’’ (Seuring and Müller, 2008; Yawar and Seuring, 2017). Buying firms use these strategies to gain a competitive advantage and to reduce the risk of reputation loss (Seuring and Müller, 2008). The focus of this dissertation is the first strategy, which is also often referred to as sustainable supply chain management. Adopting sustainable supply chain management practices is a common way of buying firms to prevent sustainability issues in their supply chains (Hassini et al., 2012).

Ahi and Searcy (2013, p. 339) define sustainable supply chain management as “the creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term”. This definition draws on the triple bottom line approach, which was introduced by Elkington (1997) since it encompasses all three aspects of sustainability. Moreover, it emphasizes not only customers but different stakeholders along the supply chain. Most existing studies do not take all three aspects of the triple bottom line into consideration. The largest number of studies concentrates on its economic aspect, followed by the environmental aspect (Rajeev et al., 2017). Studies taking the social aspect of the triple bottom line into consideration are rare, but their number has been growing in recent years (Rajeev et al., 2017; Yawar and Seuring, 2017). Consequently, further research in the area of sustainable supply chain management should focus on all three aspects jointly, and on the social aspect in particular.

The intersection between sustainable supply chain management and supply chain risk management is constituted by supply chain sustainability risk. In contrast to traditional supply chain risks, which consider for instance disruptions and delays, supply chain sustainability risks are related to difficulties in balancing the objectives of the triple bottom line (Bode et al., 2011; Giannakis and Papadopoulos, 2016). While traditional supply chain risks mainly affect a firm’s financial performance, supply chain sustainability risks can also result in reputation risk

(Höjmose et al., 2014). Figure 1 shows the interaction between supply chain sustainability risk and reputation risk, which are both the focus of this dissertation.

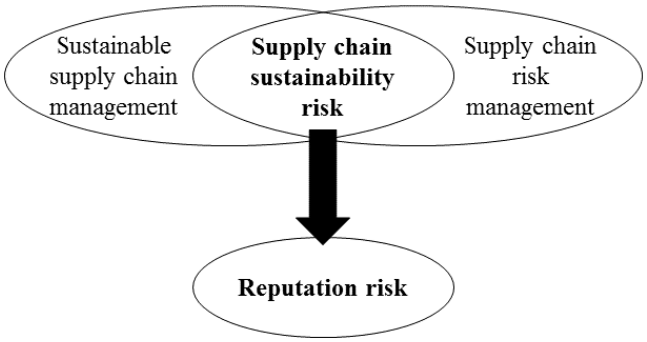

Figure 1: Interaction between supply chain sustainability and reputation risk

However, there are considerable barriers when trying to enhance the sustainability of supply chains. These are mainly higher costs, complexity and lacking communication with suppliers (Seuring and Müller, 2008). Next to communication with suppliers, supplier evaluation and disciplinary measures can be used to overcome these barriers (Cousins et al., 2004; Porteous et al., 2015).

Beginning in the late 1990s, the amount of research articles focusing on sustainable supply chain management has substantially increased, reaching its peak after 2010 (Rajeev et al., 2017). This peak in research studies after 2010 could also have occurred due to international agreements such as the 2009 Copenhagen Climate change summit, which highlighted the harmful effects of insufficient environmental protection (Bodansky, 2010). Moreover, after 2010, some tremendous industrial catastrophes occurred, amongst these the 2010 BP Gulf of Mexico oil spill, the 2011 Fukushima Daiichi nuclear power plant disaster, and the 2013 Rana Plaza building collapse. These incidents resulted in global economic, environmental, and social loss, showing that the consequences of these catastrophes have an impact for several decades (Rajeev et al., 2017). Moreover, the events lead to reputational harm, which affected the competitive advantage of the involved firms (Roberts, 2003; Parmigiani et al., 2011; Torugsa et al., 2013).

Today, researchers' interest in sustainable supply chain management is still at a growing level (Rajeev et al., 2017). Current and highly cited literature reviews with respect to sustainable supply chain management include Seuring and Müller (2008), Carter and Liane Easton (2011), Ashby et al. (2012), Hassini et al. (2012), Brandenburg et al. (2014), and Rajeev et al. (2017).

3. Capturing reputation and sustainability risks in global supply chains from a stakeholder perspective

Stakeholder theory is an established theoretical perspective within sustainable supply chain management research and has also been applied to SCSR (Touboulic and Walker, 2015). This theory is concerned with the reciprocal relationships between a firm and its stakeholders (Donaldson and Preston, 1995). A stakeholder is constituted by "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984, p. 46). Stakeholders have certain expectations concerning the behavior of a firm and evaluate its actions according to those (Barnett, 2014).

Stakeholders in a contractual relationship with the firm are referred to as primary stakeholders (e.g., suppliers and employees), and all others are secondary stakeholders (e.g., potential consumers and international organizations) (Clarkson, 1995). Without the primary stakeholders' continuing participation, the firm cannot survive, whereas secondary stakeholders are not engaged in the operations of the firm and are, therefore, seemingly less crucial to the firm's existence (Clarkson, 1995). In the case of SCSR, however, secondary stakeholders are also highly relevant, since these stakeholders can substantially augment the consequences of adverse supply chain sustainability incidents. For instance, international organizations like NGOs can highlight the unsustainable behavior of firms for primary stakeholders, leading for instance to supplier, employee or customer boycotting.

Bridoux and Stoelhorst (2014) distinguish stakeholders with respect to their motivation in self-regarding stakeholders, who are primarily concerned with their own interests (e.g., suppliers, employees, and potential consumers), and so-called reciprocal stakeholders (e.g., international organizations), who mainly care about fairness towards others. More specifically, next to suppliers and employees, potential consumers are of great importance since purchasing is only needed if enough consumers accept the products and services at the end (Seuring and Müller, 2008). Moreover, pressure from international organizations, which hold buying firms accountable for the environmental and social misbehavior of their suppliers, can result in reputational harm for buying firms (Roberts, 2003). Hence, not only self-regarding stakeholders but also reciprocal stakeholders play an important role, since without the latter many sustainability issues would be unaddressed.

Nevertheless, the mere presence of sustainability issues in the upstream supply chain does not always provoke punishing reactions from stakeholders (Hofmann et al., 2014).

Stakeholders have different expectations about sustainability and may react differently towards buying firms facing sustainability-related grievances in their upstream supply chains (Gualandris et al., 2015). Therefore, perceived illegitimacy is subjective for every stakeholder (Bitektine and Haack, 2015).

In summary, we address all three of our research questions from a multi-stakeholder perspective. Figure 2 provides an overview of the types of stakeholders considered for the three papers of this dissertation.

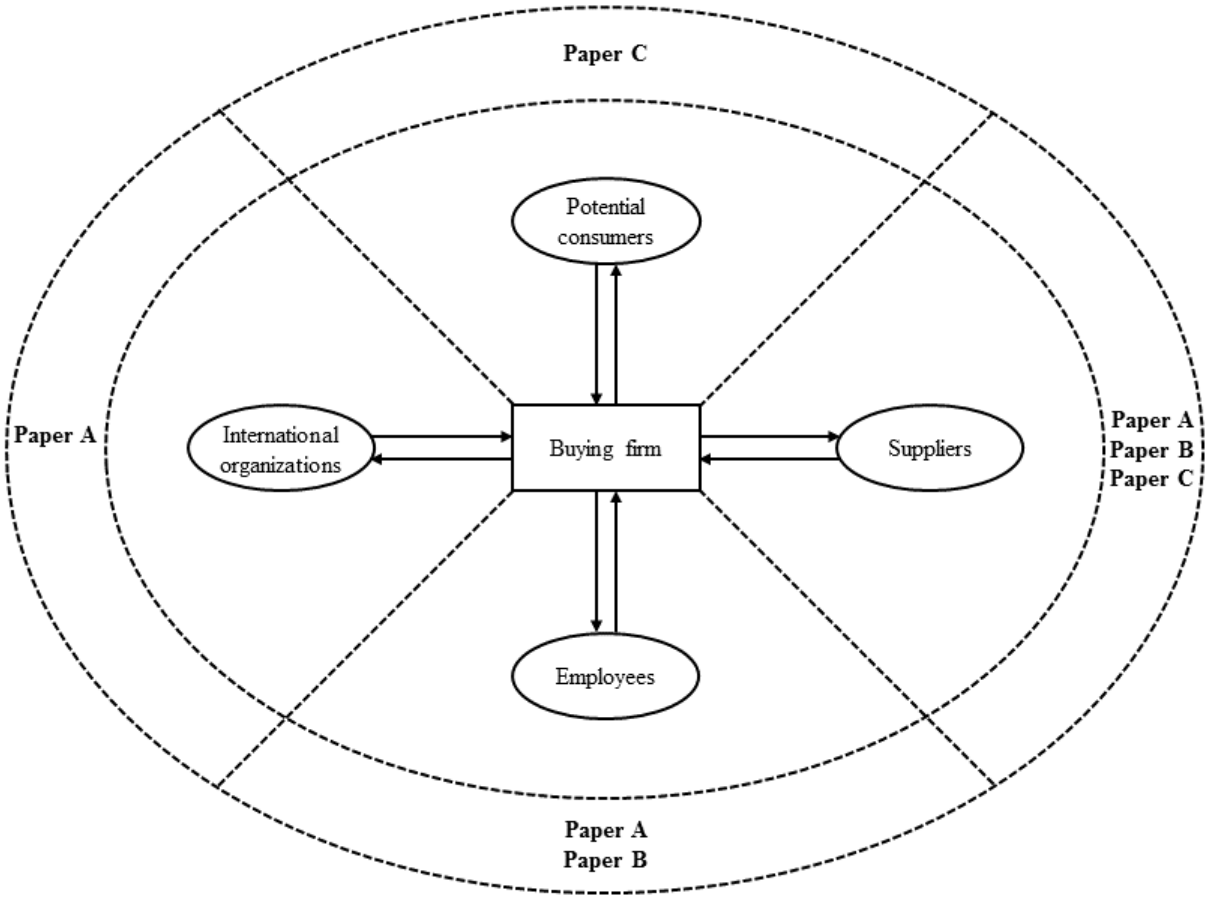

Figure 2: Stakeholder perspectives of the research papers

The stakeholder perspective is essential since it specifies the expectations of stakeholders concerning firm conduct and thus also the necessary management decisions of firms to fulfill these expectations (Freeman, 1984). Researchers conclude that enhanced financial performance can be reached by satisfying stakeholder requirements through effective and efficient management practices (Yawar and Seuring, 2017). Moreover, by addressing stakeholder requirements firms gain legitimacy (Zheng et al., 2015). This dissertation relates to the stakeholder perspective as an overarching viewpoint. In doing so, it links the stakeholder perspective with institutional theory, the resource-based view, and attribution theory.

4. Overview of the research papers

This dissertation is composed of three independent research papers which are summarized in this section. Table 1 shows an overview of the papers presented in this dissertation.

Table 1: Summary of the research papers of this dissertation[1]

	Paper A: Chapter 2	**Paper B: Chapter 3**	**Paper C: Chapter 4**
Title	Using country sustainability risk to inform sustainable supply chain management: a design science study	Increasing firm performance through sustainable reputation: a study on buyer-supplier relationships	The boundary conditions of legitimacy spillovers: assessing the impact of the inter-organizational buyer-supplier relationship
Authors	Dagmar Reinerth, Christian Busse, Stephan Wagner	Dagmar Reinerth, Christian Busse, Stephan Wagner	Dagmar Reinerth, Christian Busse, Benn Lawson, Stephan Wagner
Research question	How can the assessment of sustainability risks at the supplier level be informed by measures of country-level sustainability risk?	To which extent can a reputation for sustainable business conduct be translated into a competitive advantage?	How do the characteristics of the inter-organizational relationship between the buying firm and the supplier affect the extent of negative legitimacy spillovers due to supplier misconduct?
Theory	Institutional theory	Resource-based view	Attribution theory
Methodology	Design science	Panel data regression with fixed effects	Scenario-based experiment
Data	Secondary data for 17 countries from 10 international organizations; 14 phone conversations and 4 workshops with a technology firm	Secondary data from the analyzed technology firm: 4,107 suppliers from 45 countries over the five years from 2011 to 2015	Survey data from a scenario-based online experiment with 400 participants from the US and India
Major contribution	Reconciling the scholarly SCSR discourse with the buying firms' pursuit of efficiency	Augmenting the resource-based view by distinguishing between the supplier's internal and external sustainability reputation	Showing the boundary conditions of legitimacy spillovers in inter-organizational buyer-supplier relationships dependent upon consumers' judgment
Publication status	Published as: Reinerth, D., Busse, C., and Wagner, S.M. 2018. "Development of a supply chain sustainability risk map: insights from a design science study." *Journal of Business Logistics*, in press.	Full working paper, ready for submission.	Full working paper, ready for submission.

[1] Contribution of Dagmar Reinerth to all papers: project lead, research design, literature review, data collection, data analysis, and paper drafting

4.1 Paper A: "Using country sustainability risk to inform sustainable supply chain management: a design science study"

4.1.1 Motivation and research objective

Due to the availability of modern information and communication technology, stakeholders often punish buying firms for any sustainability-related grievances at their suppliers, even if they occur in remote locations (Autry et al., 2013). For instance, recently punishing stakeholder reactions occurred in the case of international gold refiners who were scrutinized for sourcing gold from Ghana where children were employed in unlicensed mines (Human Rights Watch, 2015).

However, because of time and budget constraints in business practice and due to the complexity of global supply chains, buying firms cannot assess every supplier concerning SCSR (Christopher and Lee, 2004). Yet, no comprehensive framework for efficient SCSR assessment is available (Gimenez and Sierra, 2013). Against this background, this study investigates how the SCSR associated with an individual supplier can be assessed in an efficient manner using publicly available proxy variables at the country level.

4.1.2 Methodology and results

The study employs a design science strategy, based on the cooperation with a German technology firm, to develop an SCSR map as technological solution design. It uses institutional theory as theoretical base for analyzing publicly available data from ten international organizations. Moreover, 14 phone conversations and four workshops with the analyzed buying firm enhance the data selection process.

In total, the study takes 15 environmental-, social-, and governance-related sustainability risk factors into account for the analysis. Each of these issues is represented by one to three proxy variables from the ten international organizations. For the evaluation of the country-level SCSR, the quantile for each country is calculated by using the lowest and the highest value of the proxy variable amongst all countries. The solution artifact shows the weighted average values for all risk factors as the country-level total SCSR.

4.1.3 Contributions

The study theoretically shows how to use publicly available country-level proxy variables to render supplier-level sustainability risk more easily manageable. With the developed SCSR map, it is possible for researchers to explain variations in sustainability performance through

accurate indicators and thereby to obtain detailed knowledge about the breakdown of SCSR. Moreover, the study contributes to SCSR research by reconciling the scholarly SCSR discourse with the buying firms' pursuit of efficiency. Furthermore, the study elucidates how design science research can augment a research agenda, in this case about SCSR, such that it aligns the scholarly discussion more closely with the demands of corporate practice. In this vein, our study also contributes by adding stakeholder sensitivity towards SCSR to the research agenda.

In practical terms, the technological solution design is directly applicable for managers to assess SCSR at the country level, and it can serve as a decision basis for the management of individual suppliers helping to save time and SCSR assessment costs. In this sense, it is worthwhile for managers to use the easily applicable SCSR map first before applying or relying on other supplier control or development activities for assessing current and potential future suppliers, and for comparing several supplier alternatives.

4.2 Paper B: "Increasing firm performance through sustainable reputation: a study on buyer-supplier relationships"

4.2.1 Motivation and research objective

Nowadays, buying firms have the technological possibility to adequately evaluate their suppliers regarding multiple criteria. Traditional evaluation criteria are quality, delivery reliability and price/cost (Ho et al., 2010). Yet, firms also have to include criteria concerning sustainability in their supplier evaluation due to reputational reasons (Reuter et al., 2010). A recent example is the use of antibiotics in the meat and poultry supply chains of the 25 largest U.S. fast food and fast casual restaurants (e.g., Taco Bell, Pizza Hut, and KFC) (CNN, 2015). In this case, the unsustainable supplier reputation resulted in punishment by the buying firm by, for instance, replacing the unsustainable suppliers with competitors.

With that in mind, this study examines whether a positive internal supplier sustainability reputation (i.e., conforming to buying firm internal sustainability expectations) and a favorable external supplier sustainability reputation (i.e., conforming to sustainability standards with regard to the law and stakeholder requirements) lead to a higher firm performance of the supplier. Moreover, the supplier's evaluation concerning traditional criteria is also included in the analysis.

4.2.2 Methodology and results

The study employs a longitudinal regression analysis, based on data from 4,107 suppliers of a German technology firm, relying on the five years from 2011 to 2015. The theoretical lens is the resource-based view (RBV), since the study elucidates to which extent a reputation for sustainable business conduct translates into a competitive advantage in the form of firm performance.

The results show that the supplier's external sustainability reputation and the supplier's evaluation have a positive significant direct effect on the firm performance of the supplier. Moreover, the supplier's evaluation mediates the relationship between the supplier's internal and external sustainability reputation and its firm performance. In this manner, the supplier's internal and external sustainability reputation has a significant positive effect on the supplier's evaluation, and the supplier's evaluation has a significant positive effect on the firm performance of the supplier.

4.2.3 Contributions

The study contributes to the scarce empirical literature on the relationship between supplier sustainability and competitive advantage. Moreover, it augments the resource-based view by distinguishing between the supplier's internal sustainability reputation and the supplier's external sustainability reputation. According to our results, both forms of sustainability reputation complement each other, ultimately resulting in a competitive advantage for the supplier. Furthermore, we did not find any sustainability reputation overinvestment effects. A better supplier sustainability reputation led to increased supplier firm performance irrespective of the supplier sustainability reputation level.

From a practical point of view, suppliers aiming at investing in a reputation for sustainable business conduct of their firm should specifically focus on their external sustainability reputation since it directly influences the order volume from their buying firms. Besides, suppliers should also concentrate on the traditional evaluation criteria quality, delivery reliability, and price/cost that remain a significant basis for their competitive advantage. In this vein, they should take into account that their evaluation is also directly influenced by both their internal and external sustainability reputation.

4.3 Paper C: "The boundary conditions of legitimacy spillovers: assessing the impact of the inter-organizational buyer-supplier relationship"

4.3.1 Motivation and research objective

Legitimacy spillovers between two organizations are an essential recent stream of research (Bitektine and Haack, 2015). Specifically, legitimacy spillovers are relevant when it comes to misconduct concerning corporate social responsibility (CSR) (Wang et al., 2016). Examples like the collapse of the Rana Plaza garment manufacturing facility in Bangladesh with more than 1,000 casualties, where many supplied leading international buying firms were accused, show the practical relevance of CSR-related negative legitimacy spillovers in inter-organizational buyer-supplier relationships (The Economist, 2013).

However, researchers have not yet focused on the responsibility attribution and punishment of a third party as a cause for CSR-related legitimacy spillovers in inter-organizational relationships. This is particularly essential in a consumer behavior context for which we develop the boundary conditions of legitimacy spillovers based on the characteristics of the inter-organizational relationship between the supplier (legitimacy source) and the buying firm (legitimacy destination).

4.3.2 Methodology and results

The study employs a scenario-based experiment with 400 consumers from the US and India as participants, who are recruited through the crowdsourcing platform Amazon Mechanical Turk (AMT). The theoretical lens is attribution theory since we analyze negative legitimacy spillovers, namely consumers' responsibility attribution and punishment towards the buying firm, in the case of a socially unsustainable supplier incident.

Our results show that the power of the buying firm over the unsustainable supplier and the foresight of the buying firm on the unsustainable supplier's activities positively influences the extent of the negative legitimacy spillover from the unsustainable supplier to the buying firm for US consumers. Moreover, in the evaluative mode (cognitive activation of the consumer takes place), the US consumers' punishment of the buying firm is higher for low buying firm power and lower for high buying firm power than in the passive mode (no cognitive activation of the consumer takes place). Except for the absence of foresight-related negative legitimacy spillovers, the results stay the same when including consumers from India. Besides, for consumers from India, we observe significantly higher overall legitimacy spillovers to the buying firm.

4.3.3 Contributions

This is the first study, which focuses on the boundary conditions of legitimacy spillovers in inter-organizational relationships dependent upon a third-party's judgment. Our analysis shows that the control of the buying firm over the unsustainable supplier positively influences the extent of the negative legitimacy spillover from the unsustainable supplier to the buying firm. Focusing on the attributional dimension controllability, we also broaden attribution theory since we add the distinction between the legitimacy assessor (in our case the consumer) in a passive and in an evaluative mode to this dimension. Moreover, we show that legitimacy lies in the eye of the beholder and can differ due to the legitimacy assessor's cognitive activation and country of origin. Finally, we enhance the understanding of consumer behavior concerning unsustainable supplier behavior by combining the research stream on legitimacy spillovers with the research stream on CSR.

Our results are also relevant for corporate practice since we show buying firm managers the extent of negative legitimacy spillovers they have to expect in the case of a socially unsustainable incident of one of their suppliers depending on their own firm's power over the supplier as well as foresight on the supplier's activities. Also, buying firm managers have to consider that the extent of legitimacy spillovers can be different depending on the country in which they operate.

5. Outlook on reputation and sustainability risks in global supply chains

The scope of this dissertation faces some limitations, which offer opportunities for future research concerning reputation and sustainability risks in global supply chains. First, this research focuses on suppliers, employees, international organizations and potential consumers as stakeholders. Further studies should consider the reactions of other stakeholder groups to reputation and sustainability risks (e.g., NGOs like Greenpeace, community groups or top management) (Rowley and Moldoveanu, 2003). Second, this investigation analyzes firms from the technology (Paper A and Paper B) and food industry (Paper C). In this vein, other industries should be explored as well to explore differences in stakeholder reactions among the industries. Third, the data for Paper C is derived from potential consumers from the US and India. Hence, further studies should focus on consumer responsibility attribution and punishment concerning socially unsustainable supplier behavior in the eyes of consumers from different countries.

Paper C of this dissertation focuses on the power dynamics in the buyer-supplier relationship. However, building on the stakeholder perspective in general, there is still limited

understanding of the power dynamics between different stakeholders in supply chains (Yawar and Seuring, 2017). This calls for future research in the area of reputation and sustainability risks considering that power is unequally distributed for various stakeholders. For instance, it would be interesting to know which stakeholder groups are the most powerful when a specific unsustainable incident occurs in the supply chain (Schmid et al., 2015).

Future research should also expand on the recent topic digitalization. In this context, information sharing between buying firms and suppliers is essential. Researchers have shown that digital platforms are beneficial for managing supply chain activities and collaborations since they lead to enhanced performance for all involved firms (Rai et al., 2006). Paper A of this dissertation provides a small contribution concerning existing software solutions for the assessment of sustainability risks in supply chains. However, the overall literature is scarce on how digitalization in general and digital platforms in specific can assist in managing reputation and sustainability risks in global supply chains.

Finally, the emerging blockchain technology has to be considered. Blockchain technology is part of the distributed ledger technology, a concept that securely records and spreads data in a network of several data stores (ledgers) (Hofmann et al., 2018). Since Blockchain technology can effect transactions between companies, it is crucial for supply chain management (Iansiti and Lakhani, 2017). Recently, many articles in the broader press have focused on the tremendous impact of blockchain technology on supply chain management (e.g., The New York Times, 2017; Forbes, 2018a: Forbes, 2018b). They illustrate the radical innovation and the disruptive force of blockchain technology. However, from an academic perspective, the interest in the intersection between supply chain management and blockchain technology is only at the very beginning. Notable pivotal studies include Nowinski and Kozma (2017) who investigate how blockchain technology can disrupt existing business models, O´Leary (2017) who analyzes possible blockchain architectures, amongst others in supply chain transactions, and Kshetri (2018) who takes into account how blockchain can assist in meeting key supply chain management objectives such as cost, quality, delivery reliability, and sustainability. Accordingly, further academic studies should scrutinize how blockchain technology can assist in managing reputation and sustainability risks in global supply chains. This is especially the case since the most important aspect of blockchain technology is to provide access to data for a widespread network, thus enabling transparency and visibility (Tapscott and Tapscott, 2017). When taking a supply chain sustainability perspective, transparency and visibility are of paramount importance since they reveal the origin of products and processes, in this way leading to enhanced traceability across the supply chain (Mol, 2015;

Casey and Wong, 2017). This enables buying firms to better address the sustainability topic in their supply chain, thus driving supply chain performance (Nowinski and Kozma, 2017).

In conclusion, reputation and sustainability risks can be managed, but never entirely avoided in global supply chains. It is essential for buying firms and suppliers to be aware of these risks and to address them to gain competitive advantage.

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CHAPTER 2 – USING COUNTRY SUSTAINABILITY RISK TO INFORM SUSTAINABLE SUPPLY CHAIN MANAGEMENT: A DESIGN SCIENCE STUDY[2]

Abstract

The sustainability of our global supply chains is an essential concern in strategic supply chain management research. Modern information and communication technologies enable stakeholders to punish buying firms for any sustainability-related grievances at their suppliers, even in remote locations. This study investigates how the notion of country sustainability risk can inform sustainable supply chain management, in particular with respect to sustainability risk assessment at the individual supplier level. Drawing on institutional theory, we provide insights surrounding the emergence of environmental, social and governance-related country-level sustainability risks and show their implications for and application in sustainable supply chain management. The study employs a design science methodology, based on cooperation with a multi-divisional German technology firm, to develop a supply chain sustainability risk map as technological solution design. This paper contributes to the study of SCSR by reconciling the scholarly SCSR discourse with the buying firms' pursuit of efficiency. Moreover, it elucidates the augmentation of a research agenda through a design science approach. In practical terms, the technological solution design can directly inform managers about SCSR at the country level, and serves as a decision basis for the management of individual suppliers.

Keywords: supply chain risk, sustainability, design science, institutional theory, stakeholder

[2] Published as: Reinerth, D., Busse, C., and Wagner, S.M. 2018. "Development of a supply chain sustainability risk map: insights from a design science study." *Journal of Business Logistics*, in press.

1. Introduction

Today, buying firms assess their global suppliers not only in terms of economic criteria such as quality and price, but also with respect to environmental criteria such as emissions and waste and social criteria such as pay and workplace security (Klassen and Vereecke, 2012; Lee et al., 2014; Sanders and Wood, 2015). They do so because stakeholders observe buying firms closely and may punish them if they regard their suppliers' sustainability-related conditions as illegitimate (Carter and Rogers, 2008; Reuter et al., 2010).

On the one hand, the resulting supply chain sustainability risk (SCSR) has gained importance in recent years due to the advances in information and communication technology offered by the internet and its associated technologies and services (Isenmann et al., 2007; Autry et al., 2013). Through media such as online newspapers or Facebook, stakeholders can easily obtain and share information about negative sustainability-related incidents in supply chains (Bansal, 2005). Apple, for instance, was recently criticized for purchasing from cobalt mines in the Congo where children and adults were found to be working in hazardous conditions (Fortune, 2017).

On the other hand, supply chain complexity keeps buying firms from assessing the sustainability of all of their suppliers (Bode and Wagner, 2015; Rossiter Hofer and Knemeyer, 2009). Buying firms therefore often face information-processing challenges surrounding the sustainability-related conditions in their upstream supply chains (Busse et al., 2017b; Förstl et al., 2018). Consequently, they are rethinking the SCSR assessment strategies for their complex supply chains (Flint and Golicic, 2009; Golicic and Smith, 2013). New technologies and software tools can support this effort, responding to the increased need for efficient SCSR assessment (Shevchenko et al., 2016; Wieland et al., 2016). Nevertheless, no comprehensive framework for an efficient SCSR assessment is available (Gimenez and Sierra, 2013).

SCSR research has shown *that* country-level risk is an established criterion for selecting a supplier (Canzaniello et al., 2017) and represents the foundation for sustainability-related supplier development (Reuter et al., 2010). However, in the context of sustainability it is not yet clear *how* country-level risk can be measured nor *why* it is important for supplier assessment. Against this background, the purpose of this study is to explore whether publicly available proxy variables at the country level can facilitate supplier-level sustainability risk assessment. Under the premise that sustainability-related country-level data are available and that sustainability-related supplier-level data are not, this paper posits the following research question: *How can the assessment of sustainability risks at the supplier level be informed by*

measures of country-level sustainability risk? By answering this research question, our study provides a theoretical understanding of sustainability risk at the country level. The country-level sustainability risk measure can be used for managing supply chain complexity in the context of SCSR assessment, thereby reducing the associated costs.

We employ a design science methodology, based on cooperation with a multi-divisional German technology firm to facilitate the assessment of SCSR (van Aken, 2004; Tanskanen et al., 2015). In doing so, we strive for "finding balance in strategies that mitigate risks while not wastefully deploying resources," which is one of the "greatest hits" for practitioners (Zinn and Goldsby, 2017, p. 4). The theoretical foundation of our study is institutional theory (Campbell, 2007). The remainder of this paper is structured into four major sections. The next section describes the conceptual background, expressing the need for an efficient solution design to assess SCSR. In the third section, we present the design science methodology along with the empirical context and the solution design development process. The fourth section offers the results, which include the solution design, three use cases on applying it, and a methodological contribution that elucidates how the design science methodology can augment a research agenda, in this case for the efficient assessment of SCSR. We conclude with a summary of the study, its contributions and limitations, and possibilities for future research.

2. Conceptual background

2.1 Sustainability risk in supply chains

Risk in supply chains can be considered the likelihood of a negative deviation from the expected value of one or more performance goals (e.g., profit or customer satisfaction), leading to negative outcomes for a buying firm (Wagner and Bode, 2008; Manuj and Mentzer, 2008). Numerous researchers have developed conceptual frameworks on supply chain risk management (e.g., Förstl et al., 2010; Rao and Goldsby, 2009; Ritchie and Brindley, 2007). Although the terminology differs among the studies, a supply chain risk management procedure typically consists of four steps: risk identification, risk assessment with regard to likelihood and influence, risk handling, and risk monitoring (Hallikas et al. 2004; Kaufmann et al., 2016). Our study focuses on risk assessment. Without a structured risk assessment, an effective management of supplier sustainability can only be achieved by chance, resulting in potentially harmful financial losses (Förstl et al., 2010; Wagner et al., 2017).

In the supply chain risk management discourse, SCSR has recently attracted increased research attention (e.g., Förstl et al., 2010; Hajmohammad and Vachon, 2016). SCSR is "a condition or a potentially occurring event […] within a focal firm's supply chain […] that may provoke harmful stakeholder reactions" (Hofmann et al., 2014, p. 168). It manifests only when stakeholders become aware of one or more negative sustainability-related incidents in the upstream supply chain, assign responsibility to the buying firm, and then punish the buying firm accordingly (Hofmann et al., 2014). For example, customers as stakeholders can exert pressure on buying firms when they stop purchasing their products due to the unsustainable behavior of the buying firms' suppliers (Wood, 2015; Bregman et al., 2015). Overall, SCSR can be subcategorized into environmental-, social-, and governance-related (jointly: sustainability-related) issues (Schleper and Busse, 2013).

The largest share of a company's sustainability risks falls outside of its direct operational control in manufacturing, packaging, and transportation (Giannakis and Papadopoulos, 2016). Therefore, companies should develop an early warning instrument with regard to sustainability risks by building detailed knowledge about sustainability issues within their supply chains (Koplin et al., 2007). Information technologies facilitate the development of suitable instruments as they already have proven in the past (Boone et al., 2012). However, the development of an early warning instrument with the help of information technology is difficult, since buying firms are never fully informed about the sustainability conditions at all supplier sites because of knowledge deficits, in addition to time and cost constraints (Christopher and Lee, 2004; Sanders and Wood, 2015).

Almost all buying firms purchase products or services from a large and globally distributed network of suppliers (Choi and Hong, 2002; Sanders et al., 2016). Consequently, supply chain complexity is a key managerial issue for buying firms (Bode and Wagner, 2015; Rossiter Hofer and Knemeyer, 2009). Researchers make a distinction among horizontal (number of suppliers), vertical (number of tiers), and spatial supply chain complexity (physical distance between the buying firm and its suppliers) (Choi et al., 2001; Choi and Hong, 2002). Jointly, the three dimensions of supply chain complexity obstruct the task of supplier-level sustainability risk assessment severely. This study reduces the associated task complexity through integrating country-level sustainability measures in the supplier-level assessment process.

There are several ways for buying firms to manage SCSR at the supplier level. The most important ones are supplier codes of conduct (Emmelhainz and Adams, 1999), supplier self-

disclosures (Reimsbach and Hahn, 2013), and supplier audits (Joyce, 2006). However, supplier codes of conduct are often insufficient assessment instruments, since suppliers may sign them despite behaving unsustainably. Supplier self-disclosures require a consistent supply base without alteration of suppliers over time and the suppliers' activities can be decoupled from their self-disclosures, meaning for instance that suppliers behave unsustainable despite claiming to be sustainable in their self-disclosure (Meyer and Rowan, 1977; Jiang, 2009). Supplier audits are very costly, making it prohibitive for them to be performed for each and every supplier (Spekman and Davis, 2004). The same rationale applies to supplier development activities like trainings or improvement projects which can enhance the sustainability standard of suppliers (Sancha et al., 2015; Busse et al., 2016b), but are inherently costly as well. Against this background, an efficient assessment of SCSR at the country level can alleviate the concerns of the supplier-level sustainability risk assessment mentioned above.

2.2 An institutional explanation of sustainability risks in supply chains

Our research focus on the differences in SCSR explained by country-level differences suggests the use of institutional theory (Campbell, 2007). Institutional theory is an established theoretical perspective within sustainable supply chain management research (Tate et al., 2011; Touboulic and Walker, 2015; Zhu and Sarkis, 2007) and has also been applied to SCSR (Busse et al., 2016a). The theory is concerned with the impact of institutions on the conduct of social actors like firms (Powell and DiMaggio, 1990; Scott, 1987; Zucker, 1987). Institutions in this sense consist of "multifaceted, durable social structures, made up of symbolic elements, social activities, and material resources" (Scott, 2014, p.57). Due to institutional imprinting (Mezias, 1990), the country level is a reasonable level of analysis.

Institutions lead to different expectations with regard to the conduct of firms (Meyer and Rowan, 1977). Importantly, these expectations vary among countries (e.g., Dobbin, 1994; Kostova and Roth, 2002). There are three institutional pillars (Scott, 2014). First, the regulative pillar is based on differences in rules, regulations and laws among countries. Suppliers are more likely to act sustainably if there are strong regulative elements with regard to sustainability, industrial self-regulation that ensures sustainable conduct, and political regulations through which NGOs can operate (Campbell, 2007; North, 1990). In this vein, regulatory uncertainty even increases country-specific differences in sustainability due to differences in regulation enforcement (Mair and Marti, 2009). Second, the cultural-cognitive pillar captures "widely held beliefs and taken-for-granted assumptions that provide a framework for everyday routines, as well as the more specialized, explicit and codified knowledge and belief systems promulgated

by various professional and scientific bodies" (Scott and Meyer, 1994, p. 81). Suppliers are socially embedded in their country of origin due to their managers, employees, and owners, who have a shared understanding of cultural-cognitive elements. This results in county-specific differences with respect to SCSR. Finally, the normative pillar describes the broader social obligations in a country, such as the working conditions of its employees (Xu and Shenkar, 2002). In the same manner, country-specific differences in SCSR occur because of managers, employees, and owners holding the same values with respect to normative elements. To sum up, the three pillars provide evidence that the country-specific SCSR shapes the suppliers operating in this institutional environment.

Global supply chains usually involve numerous institutions and the perception of what represents legitimate conduct differs greatly among the institutional environments (countries) (Busse et al., 2016a). Only when firms comply with the requirements from their institutional environment (country) are they considered as legitimate (Busse et al., 2016a; Suchman, 1995). Consequently, firms are influenced both by internal efficiency requirements and by the external institutions in their country (DiMaggio and Powell, 1983; Scott, 2014).

Country-level analyses have become increasingly popular in sustainability research. For instance, Maignan and Ralston (2002) show that there are differences in firms' public commitment to social sustainability in France, the Netherlands, the United Kingdom, and the United States, Husted (2005) establishes a link between countries' cultural properties and their environmental sustainability, Vachon and Mao (2008) investigate the link between supply chain strength (number and quality of suppliers) and sustainable development at the country level, and Busse et al. (2016a) demonstrate that the institutional distance between the buying firm and the supplier country increases the probability for SCSR.

2.3 Existing software solutions for the assessment of sustainability risks in supply chains

Software solutions for SCSR assessment received surprisingly little scholarly attention, despite their obvious relevance to corporate practice in our digitally interconnected world. With the application of such software solutions, supply chain complexity can be better managed by buying firms, leading to a reduced risk of undesirable stakeholder reactions due to negative sustainability-related incidents in the upper supply chain and to lower SCSR assessment costs (Waller et al., 2015). Therefore, we address the topic of efficient software-based SCSR assessment.

Several idiosyncratic software solutions facilitate the assessment of SCSR at the country level (see Table 2). Some software solutions are survey- (e.g., Achilles) or audit-based (e.g., Enablon), while others rely on firm-internal documents (e.g., Ecovadis) or measure criticism from the media (e.g., Reprisk). In this case, the studied German technology firm strove to have a scientifically viable software solution that relies on transparent and publicly available secondary data from renowned international organizations to ensure credibility. The solution should also be free of charge. To be clear, we make no assertion that the solution design developed in this study is superior to extant software solutions, but it is based on rigorous research.

Table 2: Existing software solutions for SCSR assessment

Software solution	Tool description	Data collection
Achilles	• Achilles offers a fully managed supplier registration, information, compliance management, and pre-qualification service. • It provides supplier information via 40 online communities, covering key industries in more than 130 countries. • It underpins compliance with legislative and business standards, assessing suppliers' capabilities and financial, legal, health, safety, environmental, and quality risks.	• Pre-qualification (supplied products and services, business locations, annual revenues, anticipated contract value, number of employees). • If necessary, surveys and audits as next step.
ChainPoint	• ChainPoint provides auditing and certification and makes it easy to establish new standards, or to use existing ones, and apply them along the supply chain. ChainPoint Analytics show the customer where he stands in achieving his KPIs by visualizing information gathered from the supply chain. ChainPoint Storytelling uses smartphone scanning to connect customers to supply chain information. • It monitors product-related factors at the supplier level (e.g., child labor, deforestation, and CO_2 emissions).	• On-the-ground monitors, lab technicians, and inspectors provide real-time details. • Direct connection with IT systems already in place. • If necessary, audits and certificates as next step.
CSRware	• CSRware prepares companies for U.S. federal contracts, anti-slavery requirements, supply chain performance improvement, and cost reduction by driving corrective actions. • Different industries are considered.	• Integrated scorecards/ surveys. • If necessary, self-designed scorecards/ surveys with existing or newly defined criteria.

Ecovadis	• Ecovadis provides reliable CSR ratings and scorecards, covering 21 CSR indicators, 150 commodities, and 110 countries. • It is useful for both buyers and suppliers.	• Online surveys customized to sector, size, and country. • Supporting documents (e.g., CSR report, Annual Report and Sustainable Procurement Strategy).
Enablon	• Enablon makes it possible to assess, audit, and validate process efficiency and product compliance internally or throughout the supply chain. • It enables assessment of suppliers' and contractors' compliance with standard and non-standard protocols around CSR, labor, environment, conflict minerals, health, and safety. • The Enablon Publisher is an online solution to design and publish digital reports for sustainability, environment, health, safety, and risk management.	• Auto-evaluation surveys for suppliers. • Audits.
Intertek	• Intertek's supply chain management services measure business risk, capacity, and capabilities, workplace conditions, product quality and safety, security, and environmental sustainability. • Its portfolio of risk assessment tools and audit solutions includes global supplier management systems, trade goods (online marketplace where responsible buyers and trusted suppliers can get trusted information about their supply chain partners), think green initiatives, supplier qualification programs, workplace conditions assessment, mill qualification program, global security verification, and sandblasting assessment and management (in the garment industry).	• Inspections and audits.
RepRisk	• RepRisk manages environmental, social, governance, and reputational risks in day-to-day business. • It is useful for banks, insurance providers, asset managers and owners, supply chain and procurement managers, and compliance, investor relations, CSR, and communication teams. • It provides a global analysis of 34 sectors, 73,011 companies, 18,416 projects, 12,999 NGOs and 9,464 government bodies.	• Data from the media, stakeholders, and other public sources external to the company.

Thinkstep SoFI	• Thinkstep SoFI analyzes the supply chain and identifies hotspots, benchmarks suppliers' performance, provides individual feedback reports, shares best practices throughout the supply chain, tracks improvements with supplier score cards, and manages supplier audits and follow-up actions. • It can be used for the aspects environment, health and safety, carbon management, sustainability reporting, energy management, and sustainable supply chain.	• Automated data capture from ERP systems and meters. • Global Reporting Initiative and Carbon Disclosure Project surveys. • 100.000 greenhouse gas factors with automated updates.
Verisk Maple Croft	• Verisk Maple Croft integrates global risk analytics, expert insights, and user-centric platforms. • It includes more than 200 risk indices and interactive maps evaluating the key environmental, social, economic, and political risks for all countries down to the subnational level.	• Surveys and scoring frameworks for analyzing qualitative data.

3. Methodology

3.1 Design science methodology

Even though there has been profound scholarly attention to the sustainability of our global supply chains, most modern supply chains are still unsustainable (Mollenkopf et al., 2010; Pagell and Shevchenko, 2014). In this vein, Goldsby and Zinn (2016) recognized that firms face unprecedented challenges that can be solved by academic researchers. With the *Journal of Business Logistics* Practitioner Panel, Zinn and Goldsby (2017) identified that finding strategies for risk mitigation that do not consume too many resources represents an essential research topic in supply chain management. They conclude that researchers should also study practical challenges to generate interesting results and, consider applied research as an essential field of study for the *Journal of Business Logistics*.

Against this background, this study subscribes to the design science paradigm. It relies on a design science methodology focusing on a multi-divisional German technology firm. The benefit of the design science methodology is its aim of enhancing practice (Holmström et al., 2009). It provides applicable solutions and, hence, increases the effectiveness of companies (Denyer et al., 2008). Therefore, employing a design science methodology can be particularly worthwhile for researchers who are concerned about the practical relevance of their results (van Aken, 2005). In contrast to design sciences, which are an appropriate means of solving real-world business problems, explanatory sciences revolve around the development of theory

(Denyer et al., 2008). Table 3 summarizes the main differences between the prescription-driven design sciences and the description-driven explanatory sciences (van Aken, 2004; Holmström et al., 2009).

Our design science study seeks an efficient way to assess SCSR. We develop an SCSR map, specifically an Excel tool that provides an overview of the issue-specific and overall sustainability risk for different purchasing countries of the technology firm under consideration. Since we generate an initial solution design with our SCSR map, the study belongs to the solution incubation phase. We are not refining the SCSR map (i.e., testing it with a broader range of companies). Therefore, this research does not include the solution refinement phase.

Table 3: Differences between design sciences and explanatory sciences (adapted from van Aken, 2004; Holmström et al., 2009)

	Design sciences		**Explanatory sciences**	
Focus	Solution focused		Problem focused	
Research question	Solutions for a class of problems		Explanation	
Research phases	1. Solution incubation	2. Solution refinement	3. Explanation I	4. Explanation II
Research objective	Development of initial solution design	Refinement of initial solution design; solving the problem	Development of substantive theory; establishing theoretical relevance	Development of formal theory; strengthening theoretical and statistical generalizability
End product	Solution to a problem		Explanatory theory, prediction	

Simon (1996, p. 130) states that "everyone designs who devises courses of action aimed at changing existing situations into preferred ones." In accordance with this view, management itself can be considered a design discipline (Simon, 1996). The term *design science* is chosen to emphasize the orientation to knowledge-for-design, which should offer solutions for real-world problems in contrast to the operational action and the skills necessary for appropriate action. The latter is the domain of practitioners (van Aken, 2005). A researcher pursuing a design science methodology matches a means to an end. Means-end analysis is based on current states, requested states, and the distinction between the two. The activities that modify the current state into the requested one are also in focus (Pfeffers et al., 2007). The design science methodology assists in achieving the requested state (Holmström et al., 2009; Simon, 1996). Either the means and/or the end should be newly developed (Gregor and Jones, 2007). In this

study, the means is newly generated, since we propose an SCSR map as new technological solution design. Design science research should produce generic and actionable knowledge (Hodgkinson and Healey, 2008; Jelinek et al., 2008). This required generality is incorporated into the solution design of our study through the use of publicly available proxy variables.

Van Aken (2004) argues that the mission of academic research in design science is to generate scientific knowledge that contributes to the design of measures or artifacts that are useful for human intentions (Simon, 1996). These measures or artifacts can follow "CIMO logic," which describes how, within a certain problem context (C), an intervention (I) triggers generative mechanisms (M) that lead to certain outcomes (O) (Denyer et al., 2008). In this study, (C) refers to the evaluation of a supplier's sustainable business conduct by a renowned buying firm that is scrutinized by its stakeholders. The SCSR map represents a technological intervention (I) whose adoption facilitates the efficient evaluation of SCSR as a generative mechanism with the help of country-level data as a predictor (M). The outcome (O) is that SCSR at the level of the individual supplier can be assessed (i.e., predicted) in an automated manner by means of proxy variables at the country level. The application of the CIMO logic ensures a rigorous and scientific development of the solution design (Hevner et al., 2004).

Design science research has been discussed in and publicized by leading management journals in recent decades (e.g., Denyer et al., 2008; Holmström et al., 2009; Kieser et al., 2015; Romme and Endenburg, 2006; van Aken, 2004; van Aken et al., 2016). The approach is also quite established in leading information systems journals (e.g., Abbasi and Chen, 2008; Adomavicius et al., 2008; Pries-Heje and Baskerville, 2008). Moreover, a growing number of supply chain management studies has adopted the design science methodology in recent years. For example, Finne and Holmström (2013) investigated a triadic collaboration for service delivery, Schleper and Busse (2013) developed a standardized supplier code of ethics, Holmström and Partanen (2014) explored digital manufacturing-driven transformations of service supply chains for complex products, Tanskanen et al. (2015) analyzed the adoption of on-site shops in construction supply chains, Busse et al. (2017c) studied how buying firms with a poor supply chain visibility can use their stakeholders to detect SCSR, and Groop et al. (2017) enhanced the efficiency of the home care delivery system of a Northern European city.

3.2 Empirical context

In this study, we collaborated with a multi-divisional German technology firm with a revenue of around four billion Euro, which sources from more than 20,000 suppliers and has an invoice volume of approximately three billion Euros. Originally, the company sought to generate at

least 80% of its invoice volume with suppliers who guaranteed certain sustainability standards via self-disclosure forms. However, assessing SCSR in this manner turned out to be inefficient, due to a high variability in the supply base. For instance, the same suppliers who accounted for 80% of the invoice volume in the financial year 2012/2013 accounted for only 54% of the invoice volume in the financial year 2014/2015. Hence, a more efficient SCSR assessment method was required.

In our initial workshops with the technology firm, we established requirements for the development of the SCSR map. First, the proxy variables should be based on publicly available data from internationally renowned organizations to ensure high-quality data and instill trust in the assessment. In this vein, the proxy variables are also accessible by the buying firm itself since they can be found without access restrictions on the websites of the international organizations. Second, the proxy variables should be effective such that they describe the manifestation of the risky sustainability issues as well as possible. This means that the country-level proxy variables should be adequate predictors for the supplier-level sustainability risk. Third, from an efficiency perspective the number of proxy variables should only be as high as necessary but as low as possible to ensure a practical solution. Fourth, the SCSR map is supposed to complement the extant, sustainability-unrelated, risk assessment tools and processes. For this reason, we did not consider operational supply chain risks.

The scope of the SCSR map was defined such that it covered most of the purchasing in terms of the country of origin. We selected the countries with respect to their purchasing volume in the previous three financial years, their current importance for the technology firm, and their SCSR susceptibility. While the importance of individual suppliers varies substantially over time due to the fluctuations in the supply base with regard to invoice volume, the 17 purchasing countries chosen here are responsible for a large share of the invoice volume over a longer time.

3.3 Solution design development process

The supply chain sustainability issues considered here were adopted from a content analysis of supra-organizational supplier codes of conduct (Schleper and Busse, 2013). A supply chain sustainability *issue* only becomes *risky* to the extent that it can elicit punishment from stakeholders (Reuter et al., 2012). The understanding of what constitutes illegitimate behavior, however, differs substantially among alternate legitimacy contexts, for example for stakeholders from various countries (Busse et al., 2016a). For instance, a sustainability issue might be perceived as illegitimate by stakeholders in a developed economy (and might therefore become a risky sustainability issue for a buying firm), but as legitimate by stakeholders living

in an emerging economy. Empirical research results on stakeholder sensitivity vis-à-vis the most typical SCSR issues contingent on the legitimacy context are not yet available. Therefore, we relied on the perceived riskiness of the different sustainability issues in the German legitimacy context, which we discussed with the firm numerous times in 14 phone conversations (with an average duration of 30 minutes and involving two participants) and four workshops (one on-site workshop at the technology firm and three telephone workshops for an average duration of 120 minutes and with five participants on average). All firm participants were knowledgeable purchasing or sustainability managers. The importance of the risky sustainability issues was assessed during the same phone conversations and workshops, based on the expected intensity of stakeholder reactions to a negative sustainability-related incident.

To assess the manifestation of the risky sustainability issues for the countries studied, we considered all relevant international organizations (15 organizations), which provide proxy variables that describe the level of risk associated with individual suppliers. In the end, we adopted secondary data from ten international organizations: German Investment and Development Corporation, European Commission, International Labor Organization (ILO), International Organization for Standardization (ISO), Organization for Economic Cooperation and Development (OECD), Transparency International, United Nations (UN), United Nations Children's Fund (UNICEF), World Bank, and World Wide Fund for Nature (WWF). Data from Amnesty International, Business Environmental Performance Initiative, Business Social Compliance Initiative, Supplier Ethical Data Exchange, and the World Health Organization were also considered but not chosen. Across all proxy variables for all considered countries, the average secondary data availability is 86%, which means that the collected data is 14% incomplete for the 17 countries, since for some proxy variables, the value for at least one of the countries is missing.

4. Results

4.1 Solution design

This study considers 15 risky sustainability issues for the analysis. Each of these issues is represented by one to three proxy variables from the secondary data sources. Four risky sustainability issues – disposal and waste reduction, environmentally friendly products and practices, emissions and pollution, and water conservation and reduction – comprise the environmental dimension. The social dimension consists of seven risky sustainability issues, which are non-discrimination, child labor, freedom of association and collective bargaining,

forced labor, workplace safety and health, remuneration, benefits and wages, and working hours. Finally, the governance dimension contains four risky sustainability issues: compliance with local and (inter)national laws and regulations; safe products and services; corruption, extortion, and bribery; and human rights. Table 4 shows all risky sustainability issues for the environmental, social, and governance dimensions with their associated proxy variables and data sources.

Table 4: Solution design form

Dimension	Risky sustainability issue	Proxy variable	Data source
Environmental	Disposal and waste reduction	• Municipal recycling rate	UN
		• Share of total population served by municipal waste collection	UN
	Environmental friendly products and practices	• Share of companies with an environmental management system according to ISO 14001 with regard to total domestic companies	ISO World Bank
	Emissions and pollution	• CO_2/million $ GDP	European Commission, World Bank
	Water conservation and reduction	• Water scarcity as a ratio of available to consumed water	German Investment and Development Corporation, WWF
Social	Non-discrimination	• Gender wage gap	ILO
	Child labor	• Share of children in child labor	UNICEF
	Freedom of association and collective bargaining	• Voice and accountability index	World Bank
		• Trade union density rate	OECD
		• Collective bargaining coverage rate	ILO
	Forced labor	• Share of workers in forced labor	ILO
	Workplace safety and health	• Rate of non-fatal occupational injuries	ILO
		• Rate of fatal occupational injuries	ILO
		• Labor inspection rate	ILO
	Remuneration, benefits, wages	• Working poverty rate (<$2/day)	ILO

	Working hours	• Weekly normal hours limit	ILO
		• Distribution of the employed population by hours of work	ILO
Governance	Compliance with local and (inter) national laws and regulations	• Rule of law index	World Bank
		• Government effectiveness index	World Bank
	Safe products and services	• World distribution of ISO 9001 certificates with regard to total domestic companies	ISO, World Bank
	Corruption, extortion and bribery	• Bribe payers index	Transparency International
		• Control of corruption index	Transparency International
	Human rights	• Ratification share of the 18 International Human Right Treaties	UN
		• Accreditation of national human rights institutions	UN

Table 5 shows the exact form and function of the SCSR map spreadsheets. As a basis for the determination of the SCSR, the quantile for each country is calculated by considering the lowest and highest value of the proxy variable amongst all countries. For example, ranking Austria in the 60% quantile for a proxy variable implies that 60% of all countries have an equal or worse value for this proxy variable. Whenever the data for one or several proxy variables is unavailable, these proxy variables are set to the highest risk. The solution depicts the weighted average values for all risky issues as the country-level overall SCSR. Overall, the approach identifies France as the least risky country and Serbia as the riskiest. Table 6 depicts the exact SCSR for all countries and sustainability issues. With these results, it is possible for managers to save time and SCSR assessment costs by identifying the most relevant risky sustainability issues. The results are reasonable from the perspective of the multi-divisional German technology firm, which is implementing the SCSR map in its purchasing operations, suggesting that it is possible to assess SCSR with environmental, social, and governance proxy variables at the country level, in response to our research question.

Table 5: Form and function of the SCSR map spreadsheets

Spreadsheet	Form and function
1	General introduction to the SCSR map: no modification possible
2	User input: the weighting factors for the risky sustainability issues can be modified
3	SCSR for different countries: automatic calculations to assess the SCSR, no modification possible
4-7	Environmental SCSR: selected proxy variables with their publicly available data sources and their relevant stored data, modification possible whenever necessary
8-14	Social SCSR: selected proxy variables with their publicly available data sources and their relevant stored data, modification possible whenever necessary
15-18	Governance SCSR: selected proxy variables with their publicly available data sources and their relevant stored data, modification possible whenever necessary

Table 6: SCSR for all countries and all sustainability issues (values in %)

	Risky sustainability issue																		
	Environmental					Social								Governance					
Country	Disposal and waste reduction	Environmental friendly products and practices	Emissions and pollution	Water conservation and reduction	**TOTAL**	Non-discrimination	Child labor	Freedom of association and collective bargaining	Forced labor	Workplace safety and health	Remuneration, benefits, wages	Working hours	**TOTAL**	Compliance with local and (inter-) national laws	Safe products and services	Corruption, extortion and bribery	Human rights	**TOTAL**	**TOTAL**
Austria	88	76	82	69	**78**	7	100	84	100	55	100	50	**75**	88	71	38	56	**63**	**72**
Brazil	8	53	65	88	**59**	43	12	8	83	6	24	18	**30**	20	65	37	50	**43**	**44**
Canada	54	6	47	94	**41**	29	100	67	100	0	100	93	**72**	86	6	88	65	**61**	**58**
Chile	4	47	35	100	**50**	0	18	41	83	42	29	18	**37**	55	53	35	91	**59**	**48**
China	0	88	18	50	**51**	0	100	22	67	0	18	50	**43**	16	88	7	24	**34**	**43**
France	75	82	94	38	**76**	79	100	60	100	88	100	71	**88**	57	76	64	100	**74**	**80**
Germany	100	65	65	13	**58**	64	100	77	100	15	100	7	**72**	80	82	87	91	**85**	**72**
Hungary	29	94	41	81	**69**	50	100	26	100	64	100	50	**75**	49	94	21	76	**60**	**68**
India	0	12	12	50	**18**	21	6	8	67	33	6	7	**25**	10	18	15	59	**25**	**23**
Italy	63	100	76	31	**75**	0	100	67	100	11	100	50	**67**	41	100	30	65	**59**	**67**
Poland	13	29	29	31	**28**	86	100	38	100	27	100	21	**71**	55	35	24	71	**46**	**48**
South Africa	0	35	24	19	**25**	57	100	27	33	21	12	18	**43**	24	41	36	71	**43**	**37**
Serbia	0	18	6	0	**9**	100	24	12	17	0	35	0	**23**	20	12	9	85	**31**	**21**
Spain	71	41	76	6	**48**	36	100	63	100	52	100	86	**80**	49	29	58	100	**59**	**62**
Sweden	96	71	94	75	**81**	93	100	67	100	64	100	50	**84**	90	47	50	47	**59**	**75**
Switzerland	63	59	100	63	**72**	14	100	66	100	73	100	39	**76**	98	59	94	29	**70**	**73**
United States	79	24	53	56	**44**	71	100	31	100	36	100	57	**74**	67	24	66	18	**43**	**54**

The following three tables define the environmental (Table 7), social (Table 8), and governance (Table 9) proxy variables, illustrating their measurement, and presenting a rationale supporting their effectiveness. The respective definitions stem from the international organization corresponding to the proxy variable. The measurement column describes the data collection methods used by the international organizations to calculate the proxy variables. Because of the effort associated with the collection of the data, it would not make sense for the buying firm to collect primary data about the proxy variables on its own. The effectiveness column presents the reasons we regard the respective country-level proxy variables as appropriate predictors for the supplier-level sustainability risk. The general rationale is that when the proxy variable at the country level changes (falls or rises), the risk at the supplier level of the country changes (falls or rises) as well. With this simplification, complexity is reduced, thereby fostering SCSR assessment and rendering SCSR more manageable.

To preserve writing space, we illustrate the effectiveness of the proxy variables with two examples each in the environmental, social, and governance dimensions. For the environmental dimension, we chose the proxy variables "share of companies with an ISO 14001 certificate with regard to total domestic companies" and "CO_2/million $ GDP". Table 7 illustrates the remaining proxy variables.

The ISO 14000 family of standards provides practical tools for companies that aim to manage their environmental responsibilities (Babakri et al., 2003). ISO 14001 offers the criteria for an environmental management system and maps out a framework that a company or organization can follow to set up an effective environmental management system (Corbett and Kirsch, 2001). In doing so, organizations from every activity or sector can use the standards. Every year ISO conducts a count of certifications to their ISO 14001 standard. There are now more than 300,000 certifications to ISO 14001 within 171 countries. Organizations planning to be certified to the ISO 14001 standard must contact an independent certification body. The application of ISO 14001 can reassure company management, employees, and external stakeholders that the environmental impact of a firm's products is being measured and improved. The proxy variable is effective since it shows how environmentally sustainable companies in a country are operating.

The European Commission calculates the proxy variable CO_2 emissions/million $ gross domestic product (GDP) based on their data from the Emission Database for Global Atmospheric Research, the energy balance statistics of the International Energy Agency, data of the British Petroleum Statistical Review of World Energy, and recent Chinese coal

consumption data of the China Statistical Abstract. Country-specific CO_2 emissions total the fossil fuel use and industrial processes (e.g., cement production). In this way, short-cycle biomass burning (e.g., agricultural waste burning) and large-scale biomass burning (e.g., forest fires) are excluded. By relating the country-specific CO_2 emissions to the GDP, we arrive at a measure of sustainability performance that does not depend on a country's economic activity (Budzianowski, 2013). Historic time series of energy demand indicate the continuous growth of country-specific CO_2 emissions (Friedlingstein et al., 2014). Nevertheless, suppliers in countries with low CO_2 emissions per million $GDP tend to operate in a more environmentally friendly manner.

Table 7: Definition, measurement, and effectiveness of environmental proxy variables

Proxy variable	Definition	Measurement	Effectiveness
Municipal recycling rate	• Municipal waste includes waste originating from households, commerce and trade, small businesses, office buildings, and institutions (e.g., schools). It also includes bulky waste (e.g., old furniture) and waste from selected municipal services (e.g., park maintenance). • Recycling is defined as reprocessing of waste in a production process that diverts it from the waste stream, except for reuse as fuel.	• Data on municipal recycling is gathered through surveys of municipalities which are responsible for waste recycling or from transport companies that recycle the waste.	• The proxy variable covers waste recycled by or on behalf of municipalities. • Waste recycled by the informal sector, waste generated in areas not covered by the municipal recycling system, or illegally dumped waste is not included. • Therefore, all waste which is recycled from supplier sites is included. A low value of the proxy variable indicates a low environmental SCSR and, thereby, a low probability that stakeholders complain.
Share of total population served by municipal waste collection	• Municipal waste collected refers to waste collected by or on behalf of municipalities and municipal waste collected by the private sector. • It includes mixed waste and fractions collected separately for recovery operations through door-to-door collection and/or through voluntary deposits.	• Data on municipal waste is gathered through surveys of municipalities, which are responsible for waste collection, or from transport companies that collect waste and transport it to a disposal site.	• The proxy variable covers waste collected by or on behalf of municipalities. • Therefore, all waste which is collected from supplier sites is included. A low value of the proxy variable indicates a low environmental SCSR and, thereby, a low probability that stakeholders complain.

Share of companies with an ISO 14001 certificate with regard to total domestic companies	• The ISO 14000 family of standards provides practical tools for companies which want to manage their environmental responsibilities. • ISO 14001 sets out the criteria for an environmental management system and maps out a framework that a company or organization can follow to set up an effective environmental management system.	• Every year ISO performs a questionnaire which counts the certifications to their ISO 14001 standard.	• Using ISO 14001 can provide assurance to company management, employees, and external stakeholders that the environmental impact is being measured and improved. • There are more than 300,000 certifications to ISO 14001 in 171 countries which show how environmentally sustainable companies in a country are typically operating.
CO_2/million $ GDP	• Country-specific CO_2 emissions total of fossil fuel use and industrial processes, excluded are short-cycle biomass burning and large-scale biomass burning. • Gross Domestic product (GDP) is the total value added by all economic sectors.	• The proxy variable is calculated by the European Commission based on their data from the Emission Database for Global Atmospheric Research, the energy balance statistics of the International Energy Agency, data of the British Petroleum Statistical Review of World Energy, and recent Chinese coal consumption data of the China Statistical Abstract.	• Historic time series of energy demand indicate a continuous growth of CO_2 emissions, which need to be limited, particularly by limiting the level of energy-intensive activities. • Therefore, suppliers in countries with low CO_2 emissions per million $ GDP tend to operate in a more environmentally friendly manner.

Water scarcity as a ratio of available to consumed water	• Water scarcity is defined as the ratio of water footprint to water availability, in which the latter is taken as natural runoff minus environmental flow. It is classified into four levels: 1) Low water scarcity (<100%) 2) Moderate water scarcity (100-150%) 3) Significant water scarcity (150-200%) 4) Severe water scarcity (>200%) • Water resources are surface water and ground water.	• The data is taken from the Water Footprint Network which considers 405 river basins, which together cover 66% of the global land area (excluding Antarctica) and represent 65% of the global population. The land areas not covered include Greenland and the Sahara Desert in North Africa. Also excluded are many smaller pieces of land that do not fall within major river basins.	• Many stakeholders are critically observing the water consumption of suppliers. • Therefore, the question arises regarding how much water consumption suppliers are involved. • Since water scarcity is based on water consumption rather than water withdrawal, it remains an appropriate predictor for the water consumption of suppliers in a country. • The water consumption pattern is different from the population density pattern, because intensive water consumption in the industry is not related to where most people live and, hence, the proxy variable is a good indicator for environmental SCSR.

Hereafter, we describe the social proxy variables "share of children in child labor" and "frequency rate of occupational injuries." Table 8 shows the other proxy variables for the social dimension.

The ILO defines child labor as work that deprives children of their childhood, potential, and dignity; that is harmful to their physical and mental development, and that interferes with their schooling (see Appendix 2). At its worst, child labor involves children being enslaved, separated from their families, exposed to serious hazards and illnesses, and/or left to fend for themselves. The variable captures workers younger than 15 years; it draws on an increasing amount of data from national-level child labor surveys. Understanding Children's Work, an interagency program on child labor statistics and research by the ILO, UNICEF, and the World Bank, provided access to non-ILO data. Child labor is one of the riskiest sustainability issues, eliciting the strongest stakeholder reactions (Park-Poaps and Rees, 2010). An estimated 168 million children worldwide are in child labor, accounting for almost 11% of the entire child population (ILO, 2017). The higher the rate of child labor in a country, the more likely a supplier from that country is involved.

According to the ILO, an occupational accident is an unexpected occurrence, arising in connection with work which results in one or more workers being injured, killed, or contracting a disease (see Appendix 2). The number of new occupational injuries during a year, divided by the total number of hours worked by workers during the year, multiplied by 1,000,000 defines the occupational injury proxy variable. In this vein, we distinguish between non-fatal and fatal occupational injuries in our SCSR map. The data used varies from country to country but includes mainly compensation claims received from insurance companies, self-insurers, and some government departments. Given that stakeholders are particularly interested in working conditions at supplier sites (Longoni et al., 2013), occupational injuries are one of the most important and easy-to-quantify aspects of working conditions. The lower the frequency of occupational injuries in a country, the lower the probability that unacceptable working conditions prevail at a supplier site within this country.

Table 8: Definition, measurement, and effectiveness of social proxy variables

Proxy variable	Definition	Measurement	Effectiveness
Gender wage gap (%)	• The gender wage gap is calculated as the difference between average earnings of men and average earnings of women expressed as a percentage of average earnings of men. • Full-time and part-time workers are covered.	• The methodology used for the proxy variable is the census method. The objective is to find wage data for all countries and to develop an explicit estimation treatment in the case of non-response.	• Stakeholders complain about suppliers who discriminate against their employees. • Wage inequality has been growing in many countries and is one of the most important aspects of the quantitative determinable forms of discrimination. • We assume that in countries where one form of discrimination is present, other forms of discrimination are present as well. Therefore, suppliers in countries with a low gender pay gap are more socially friendly.
Share of children in child labor	• Child labor is defined as work that deprives children of their childhood, their potential, and their dignity; that is harmful to their physical and mental development, and that interferes with their schooling. • The proxy variable includes workers younger than 15 years.	• The proxy variable draws on an increasing amount of data from national-level child labor surveys. • Understanding Children's Work, an interagency program by the ILO, UNICEF, and the World Bank, provided access to non-ILO data.	• Child labor is an SCSR which can cause the most punishing stakeholder reactions. • The estimates indicate that 168 million children worldwide engage in child labor. • The higher the risk for child labor in a country, the higher the probability that a supplier from this country is involved in child labor.

Voice and accountability index	• The proxy variable captures perceptions of the extent to which a country's citizens are able to participate in selecting their government as well as freedom of expression, freedom of association, and a free media.	• The proxy variable relies on 441 individual variables measuring different governance dimensions. • These are taken from 35 different sources which are produced by 33 different organizations.	• The media and citizens as stakeholders serve an important role in monitoring those in authority and holding them accountable for their actions. • Therefore, there is a high risk of punishing stakeholder reactions related to countries with a low voice and accountability index.
Trade union density rate	• A trade union is defined as a workers' organization constituted for the purpose of furthering and defending the interests of workers. • The trade union density rate conveys the number of employees who are union members as a percentage of the total number of employees.	• A survey was completed by the National Statistical Offices and Ministries of Labor. • Based on this survey, the trade union density rate was calculated for 77 countries. • In the EU, Switzerland, and Norway, data from the OECD Labor Force Statistics was also used.	• The right to form trade unions is the bedrock of sound industrial relations and effective social dialogue. • The trade union density rate can assist in monitoring progress towards the realization of this right. • It also provides valuable information on the quality of employee protection at sites in the respective country, portraying the average values for the suppliers.
Collective bargaining coverage rate	• The collective bargaining coverage rate conveys the number of employees whose conditions of employment are determined by one or more collective agreement(s) as a percentage of the total number of employees. • Collective bargaining coverage rates are adjusted for the fact that some workers do not have the right to bargain collectively over wages (e.g., workers in the public services).	• A survey was completed by the National Statistical Offices and Ministries of Labor. • Based on this survey, the collective bargaining coverage was only calculated for 62 countries.	• The right of collective bargaining is a fundamental principle at work. • The collective bargaining coverage rate can contribute by controlling progress towards the implementation of this right. • It offers valuable information on the quality of the relationship between employers and employees at supplier sites.

Share of workers in forced labor	• Forced labor is defined as all work or service which is executed from a person under the menace of any penalty and for which the said person has not offered himself voluntarily. • The geographical stratification of forced labor is based on a regional classification in six categories: Developed Economies and the EU, Central and South-Eastern Europe (non-EU) and the Commonwealth of Independent States, Asia-Pacific, Latin America and the Caribbean, Middle East, and Africa.	• The ILO used own reports, media reports (e.g., newspapers), NGO documents, government documents, academic reports, trade union reports, and employers' organization reports to calculate the proxy variable.	• Forced labor is an SCSR which can cause the most punishing stakeholder reactions. • While sometimes the means of coercion used by the exploiter(s) can be observable (e.g., armed guards), more often the coercion applied is subtler (e.g., confiscation of identity papers). • Forced labor, therefore, presents major challenges in terms of detection, which makes the regional estimation a valid choice. • The higher the risk for forced labor in a specific region, the higher the probability that a supplier from a country in this region is involved in forced labor.
Frequency rate of (non-)fatal occupational injuries	• A (non-)fatal occupational injury is resulting from an occupational accident. • It is calculated as the number of new (non-)fatal occupational injuries during a year divided by the total number of hours worked by workers during the year multiplied by 1,000,000.	• The data used varies from country to country but includes mainly compensation claims received from insurance companies, self-insurers, and some government departments.	• Stakeholders are interested in the working conditions at supplier sites. Occupational injuries are especially important aspects of quantitative determinable forms of working conditions. • The lower the frequency rate of (non-)fatal occupational injuries in a country, the lower the probability that unacceptable working conditions prevail at a supplier site of this country.

Labor inspection rate	• The proxy variable conveys the average number of labor inspectors per 10,000 employed persons, which provides some indication of the resources available for monitoring and enforcing appropriate work conditions and the corresponding standards.	• The proxy variable was drawn by the ILO based on own data, national reports on labor inspection, Eurostat, websites of ministries responsible for labor inspection, audits, and technical memorandums on the labor inspection and verification reports.	• Labor inspectors are public officials who secure the enforcement of the legal provisions relating to conditions of work, supply information to employers and workers concerning the most effective means of complying with the legal provisions, and bring defects or abuses not specifically covered by existing legal provisions to the notice of the authority. • The higher the labor inspection rate in a country, the lower the probability that a supplier from this country is engaged in socially unacceptable actions.
Working poverty rate (<$2/day)	• The proxy variable includes workers employed but earning less than $2 per day for full-time employment. • The workers are unable to earn enough to lift themselves and their families above the poverty threshold.	• The proxy variable relies on internationally comparable data derived from statistical standards agreed upon by the International Conference of Labor Statisticians.	• Working poverty is on the rise; 839 million workers in developing countries are still "working poor," which represents one-third of total employment. • Since standard labor market indicators such as unemployment are insufficient in developing countries, the working poverty rate is a good proxy variable for socially unacceptable working conditions at supplier sites.

Share of employed persons working more than 48 hours per week	• The proxy variable describes the extent of long working hours of employees, defined as more than 48 hours per week. • Included are persons above 15 years (16 years in the United States) who are working long hours.	• Data on the distribution of weekly working hours were collected from national statistics by household-based labor force surveys. • 60 countries participated in the survey.	• About 22% of all workers are still working more than 48 hours per week. • Long hours are not only harmful to economic efficiency but also to the mental welfare of employees. • Therefore, countries with a high share of workers working long hours represent a high risk for employees at supplier sites to have negative health impacts.
Weekly normal hours limit	• The proxy variable describes the maximum time which employees are allowed to work per week. There are four categories distinguished: 1) 35-40 hours 2) 41-48 hours 3) More than 48 hours 4) No universal statutory limit	• ILO's Database of Working Time Laws allows to undertake an analysis of laws concerning working time regulations in more than 100 countries. • In order to fill the knowledge gap for some developing countries, ILO carried out 15 additional country studies through small-scale surveys.	• Policy goals concerning the weekly normal hours limit are successfully incorporated in some countries. • Therefore, the weekly normal hours limit is a useful means to ensure that working hours provide employees at supplier sites arrangements that preserve health and safety, are family-friendly, and enhance productivity.

Below, we present the governance-related proxy variables “government effectiveness index” and “bribe payers index.” Table 9 provides the remaining proxy variables.

The World Bank’s government effectiveness index captures perceptions of the quality of public services, the quality of the civil service, and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies (see Appendix 2). It relies on 441 individual variables measuring different dimensions of governance. The World Bank takes these variables from 35 sources and 33 organizations. In countries with a low government effectiveness index, policies exist only on paper (Mair and Marti, 2009) implying that suppliers may maintain non-acceptable behavior and go unpunished. Consequently, there is a high risk of punishing stakeholder reactions when sourcing from countries with a low government effectiveness index (Busse et al., 2016a).

Continuing globalization leads to business transactions among countries with a range of norms and rules governing bribery (Baughn et al., 2010). The bribe payers index evaluates the likelihood of firms to bribe abroad. Transparency International collects the index based on the views of 3,016 executives from 30 countries who evaluated each of the 28 countries with which they interact. In doing so, it surveyed a minimum of 82 people in each country. The assessment of the ethical behavior of companies from a country correlates strongly with perceptions of foreign bribery from that country. Therefore, we argue that stakeholders view suppliers from countries, which are less likely to engage in foreign bribery as more ethically entrenched.

Table 9: Definition, measurement, and effectiveness of governance proxy variables

Proxy variable	Definition	Measurement	Effectiveness
Rule of law index	• The proxy variable captures the extent to which agents have confidence in the rules of society, in particular the quality of contract enforcement, property rights, the police, and the courts. • The likelihood of crime and violence is also included in the proxy variable.	• The proxy variable relies on a total of 441 individual variables measuring different dimensions of governance. • These are taken from 35 different sources which are produced by 33 different organizations.	• The proxy variable measures the success of a country in developing an environment in which fair and predictable rules form the basis for economic and social interactions. • Therefore, there is a high risk of punishing stakeholder reactions related to countries with a low rule of law index.
Government effectiveness index	• The proxy variable captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	• The proxy variable relies on a total of 441 individual variables measuring different dimensions of governance.	• In countries with a low government effectiveness index, policies exist on paper but are not enforced. • Non-acceptable behavior of suppliers remains unpunished and is, therefore, maintained by the suppliers. • Consequently, there is a high risk of punishing stakeholder reactions in countries with a low government effectiveness index.
Share of companies with an ISO 9001 certificate with regard to total domestic companies	• ISO 9001 sets out the requirements of a quality management system. • The seven quality management principles are customer focus, leadership, engagement of people, process approach, improvement, evidence-based decision making, and relationship management	• Every year ISO performs a questionnaire which counts the certifications to their ISO 9001 standard. • Organizations planning to get certified to must contact an independent certification body.	• ISO 9001 can be used by any organization regardless of its activity or sector. • It ensures that customers get consistent, high-quality products and services. • There are more than a million certifications to ISO 9001 in 170 countries, which show how quality-oriented companies in a country are typically operating.

Bribe payers index	• The proxy variable evaluates the likelihood of firms to bribe abroad.	• The index is based on the view of 3,016 executives from 30 countries who evaluated each of the 28 countries with which they interact.	• The assessment of the ethical behavior of companies from a country correlates strongly with perceptions of foreign bribery from that country. • Therefore, suppliers from countries which are less likely to engage in foreign bribery are seen as strongly ethically entrenched by stakeholders.
Control of corruption index	• The proxy variable reflects perceptions of the extent to which public power is exercised for private gain. • It includes petty and grand forms of corruption, as well as "capture" of the country by elites and private interests.	• The proxy variable relies on a total of 441 individual variables measuring different dimensions of governance. • These are taken from 35 different sources which are produced by 33 different organizations.	• In countries with a low control of corruption index, the government does not properly fight against corruption. • Thus, corruption by suppliers remains unpunished and is, therefore, maintained by them. • Consequently, there is a high risk of punishing stakeholder reactions in countries with a low control of corruption index since the proxy variable is correlated with citizens' self-defined well-being and with service delivery and development outcomes.
Ratification share of the 18 International Human Right Treaties	• The proxy variable refers to the consent of a country to be bound by a human rights treaty under international law. • There are three possible status: 1) State party: a country expressed its consent 2) Signatory: a country wants to examine the treaty and considers ratifying it 3) No action: a country did not express its consent	• The proxy variable is produced by the Office of the High Commissioner for Human Rights based on data obtained from and regularly updated by the United Nations Office of Legal Affairs.	• When a country ratifies one of the international human rights treaties, it assumes a legal obligation to implement the rights recognized in that treaty. • Through ratification, countries commit to introduce domestic measures and legislation compatible with their treaty obligations and to submit regular reports on how the rights are implemented. • Therefore, the higher the ratification share of a country, the more attention is directed to human rights in that country.

Accreditation of national human rights institutions	• A National Human Rights Institution is an independent administrative body set up by a country to promote and protect human rights. • Compliance with the Paris Principles is the basis for the accreditation of National Human Rights Institutions. • There are three possible types of accreditation: 1) Compliance with the Paris Principles 2) Observer Status - Not fully in compliance with the Paris Principles or insufficient information provided to make a determination 3) Non-compliance with the Paris Principles	• The proxy variable is based on administrative records of the Sub-Committee on Accreditation Reports of the International Coordinating Committee of National Institutions.	• The creation and fosterage of National Human Rights Institutions indicates a countries' commitment to promote and protect human rights. • Compliance with the Paris Principles vests National Human Rights Institutions the power to investigate, report, and publicize human rights through information and education. • The fundamental functions which National Human Rights Institutions play make them important actors in the improvement of the human rights situation and, therefore, in ensuring better working conditions at supplier sites.

4.2 Three use cases for applying the solution design

It is recommendable for managers to use the convenient SCSR map before applying or relying on other less efficient supplier assessment or development instruments. In the following, we show three use cases on how the SCSR map can inform buying firms about current and potential future suppliers–as one criterion in addition to numerous others, and how it can be used to compare several supplier alternatives.

When using the SCSR map to assess the current supply base, it is possible to presort suppliers for audits and supplier development activities according to environmental, social and governance issues, and by specific proxy variables. In this way, for example, only suppliers from high-risk countries can be chosen for criteria-specific audits and supplier development activities (Reuter et al., 2010). According to the logic of the SCSR map, for instance, current Chinese suppliers should be specifically audited and developed with regard to governance issues such as corruption, extortion, and bribery, if no supplier alternatives from low-risk countries are available.

The SCSR map can also be utilized to assess potential future suppliers. Thus, it is possible to mitigate the problem that suppliers often sign codes of conduct and still behave unsustainably. Just as for assessing a current supplier, potential future suppliers can be rated according to environmental, social and governance issues, and specific proxy variables by the buying firm. For instance, when considering a less costly supplier from India, the buying firm knows with the help of the SCSR map that it should conduct further assessment, focusing particularly on whether the supplier is socially sustainable with regard to child labor, remuneration, benefits and wages.

Often there is more than one supplier alternative, leading to the need to assess which supplier is more sustainable. Again, the comparison of the sustainability of the suppliers can be performed according to different proxy variables by using the SCSR map. For instance, when a buying firm has the choice between two, according to our SCSR map, overall equally sustainable suppliers from Austria and Germany and focuses specifically on the proxy variable water conservation and reduction, it is favorable for the buying firm to choose the supplier from Austria. However, if it wants to focus more on the proxy variable disposal and waste reduction, it is probably advantageous to cooperate with the German supplier. Therefore, with the SCSR map it is possible for buying firms to avoid the continuous collection of supplier self-disclosures for their often-changing low-risk suppliers.

4.3 Augmenting the research agenda on SCSR

The study also provides insights into future research opportunities on SCSR. First, few studies are available on the topic of how supply chain sustainability issues become SCSR (Hartmann and Möller, 2014). In particular, empirical research results on stakeholder sensitivity vis-à-vis the most typical SCSR issues contingent on the legitimacy context are not yet available. In this case, it was only possible to execute a pragmatic judgment together with the firm under consideration (Carter et al., 2015). We regarded a sustainability issue as risky to the extent that it can presumably elicit punishing stakeholder reactions for the multi-divisional German technology firm studied here. However, we do not yet know how sensitive stakeholders are i) vis-à-vis different sustainability-related issues and ii) how this sensitivity depends on the legitimacy context (Busse et al., 2016a). Therefore, our study contributed by adding stakeholder sensitivity with respect to SCSR to the research agenda. Additional research can focus on the exact determinants that influence stakeholders to punish buying firms due to negative sustainability-related incidents in their upper supply chain. Only with this knowledge is it possible for buying firms to assess SCSR in an effective and efficient manner to increase transparency, knowledge, and control.

Second, although the necessity for and benefits of SCSR management have already received substantial research attention (e.g., Bregman et al., 2015; Förstl et al., 2010; Hofmann et al., 2014), there is only scarce research concerning the efficient (i.e., low-cost) handling of these risks (Hajmohammad and Vachon, 2016). Given that ensuring the efficiency of SCSR assessment is an essential concern in corporate practice, we developed the complexity-reducing SCSR map. Future studies should also view the benefits and costs associated with SCSR assessment jointly.

5. Concluding discussion

Buying firms face substantial information processing challenges surrounding the various sustainability-related grievances lurking in their complex global supply chains (Busse et al., 2017b; Förstl et al., 2018). These challenges are aggravated by the fact that information and communication technologies grant the buying firms' stakeholders easy access to information surrounding the sustainability-related misconduct of suppliers, leading them to consider punishments of the more accessible buying firms. At the same time, the different information technologies and software tools can potentially also foster SCSR assessment for the buying firms (Boone et al., 2012), an insight that provided the springboard to this research.

We departed from the assumption that most firms look at sustainability from a rather instrumental perspective, seeing it as a potential driver to their overarching economic performance. Empirical evidence suggests that this view is indeed widespread (Deegan and Shelly, 2014). Such a business case cognitive frame (Hahn et al., 2014) implies that buying firms conceive of SCSR as a potential detriment to their own economic performance that should be carefully assessed and subsequently managed (e.g., avoided, mitigated, or accepted). In other words, in absence of a direct self-interest in supply chain sustainability (Busse, 2016), an SCSR cognitive frame can be regarded as a contextualization of Hahn et al.'s (2014) business case frame for the supply chain context. Against this background and in light of the usual resource constraints in business practice, we directed our attention not only to the task of SCSR assessment as such, but also to the buying firms' interest in an *efficient* assessment of SCSR (Hajmohammad and Vachon, 2016; Zinn and Goldsby, 2017). In doing so, we relied on the extant literature about SCSR, institutional theory, and a design science methodology. Our results illuminate which proxy variables can be chosen for assessing social-, environmental-, and governance-related SCSR at the level of the purchasing country. The designed artifact, an SCSR map, employs quantitative data from ten international organizations, including the International Labor Organization, the United Nations, and the World Bank.

5.1 Scholarly contributions

This study makes three important scholarly contributions. First and foremost, it offers a theoretical underpinning for the notion of country-level sustainability risk, drawing on institutional theory. It provides cross-level theorizing by showing how to use publicly available country-level proxy variables from international organizations to inform supplier-level sustainability risk assessment. Based on our description of the definition, measurement, and effectiveness of the proxy variables, it is possible for researchers to explain the variance in sustainability performance through specific indicators and, thereby, to gain deeper insights into the breakdown of SCSR. This is especially useful when there is a high number or high variability of suppliers in the supply base, since the SCSR does not have to be assessed for each and every supplier.

Second, our design science study helps reconcile the scholarly SCSR discourse with the buying firms' pursuit of efficiency. The importance of SCSR management has already been extensively studied. However, there is little research on the efficient handling of these risks. More research is warranted to determine how supply chain managers can not only effectively but also efficiently extend their reach in the supply chain. By means of this additional research

and the appropriate selection of purchasing countries, it is possible for buying firms to reduce the risk of stakeholder punishment and their own financial losses with respect to SCSR. By identifying which sustainability issues should be considered as risky in cooperation with the multi-divisional German technology firm, we began a conversation on the riskiness of the different sustainability issues from a stakeholder perspective.

Third, and in methodological terms, our study elucidates how it is possible to augment a research agenda based on a design science study. During the design science research process, new research questions can easily arise, and the research stream can be calibrated in such a way that it connects more closely with the practical needs underlying the respective study. In this case we calibrated the research agenda with respect to SCSR, such that it aligns the scholarly discourse more closely with the requirements of business practice (Pagell and Shevchenko, 2014, Thomas et al., 2011). In other words, our research shows how design science enables researchers to identify relevant problems in business practice. These problems might otherwise remain unresolved, since scholarly literature does not automatically consider all relevant facets of real-world problems (Hambrick, 2007). In this vein, we added stakeholder sensitivity with respect to SCSR to the research agenda, and we hope to have calibrated the stream of SCSR research such that it also considers SCSR assessment costs.

5.2 Practical contributions

This research offers an efficient tool that buying firm managers can use in assessing a supplier's sustainability risk based on the purchasing country. We worked with a multi-divisional German technology firm to develop the solution design and presented three use cases showing how the SCSR map can inform practical supplier-level risk assessment.

Due to the assessment of countries with respect to their SCSR susceptibility, buying firm managers can easily choose procurement countries with low SCSR. With the knowledge of the country-specific SCSR, they can better decide which of their current suppliers should be audited, developed, or even replaced to prevent punishment from stakeholders, which could lead to financial losses.

Additionally, the breakdown of the risky sustainability issues into four environmental, seven social, and four governance risky sustainability issues, which are represented with 24 proxy variables, substantially reduces the complexity. Buying firm managers working with suppliers from several countries can better understand the basis for similarities and differences

among countries by comparing the manifestations of the different risky sustainability issues and the values of the specific proxy variables with each other.

Finally, the results for the SCSR susceptibility of the countries are scalable, since the weighting factors for the risky sustainability issues can be modified. Therefore, the SCSR map can inform companies with different risk priorities.

5.3 Limitations and future research

The choices we made for this study have certain limitations. Although the results show a valuable estimate for the average of all suppliers in a country, individual suppliers differ in their sustainability performance and, therefore, in their susceptibility to trigger punishing stakeholder reactions. For example, a supplier from one country might have several children working in his factories, whereas another supplier from the same country does not. Moreover, there are regional differences in the sustainability performance of suppliers. Especially in emerging economies, these differences may be substantial (Hoskisson et al., 2000; Boons et al., 2013). Table 10 captures the two possible errors when assessing supplier-level risk through country-level risk, resulting from the above-mentioned variance in individual and regional supplier sustainability. A type 1 error occurs when the supplier-level risk is low but the country-level risk is high (false positive finding). Conversely, a type 2 error arises when the supplier-level risk is high and the country-level risk is low (false negative finding). We acknowledge that the SCSR map does not capture such variance in individual and regional supplier sustainability performance. However, scholars frequently face conflicts between accuracy and simplicity (Thorngate, 1976; Weick, 1999; Busse et al., 2017a). The purpose of this research was not to measure SCSR as accurately as possible, but rather to offer an efficient, complexity-reducing measurement instrument.

Table 10: Possible errors when predicting supplier-level risk through country-level risk

		Country-level risk	
		Low	**High**
Supplier-level risk	**Low**	Correct classification	Type 1 error (False positive finding)
	High	Type 2 error (False negative finding)	Correct classification

Moreover, different stakeholders do not assign the same importance to different sustainability issues (Gualandris et al., 2015). The perception of illegitimate behavior may vary among contexts, for example for stakeholders from different countries (Busse et al., 2016a). For instance, a consumer from a Western country might be more sensitive to certain sustainability issues than a consumer from a developing country. However, in accordance with the goal of complexity reduction, our study investigates only the aggregate of all stakeholders of the German technology firm, rather than focusing on the variance between stakeholders.

Next, in our dynamic global economy, the effectiveness of the proxy variables and their values might change over time. Although the SCSR map captures only the status quo, the proxy variables and especially their values can be updated with reasonable effort by using the same international organizations as data sources.

Last, but possibly most fundamentally, the SCSR map developed in this study is tailored to buying firms with business case or SCSR cognitive frames as potential applicants. While such frames are clearly widespread (Deegan and Shelly, 2014), they are not the only possible frames for viewing supply chain sustainability. An alternative paradoxical frame might be more complex and might juxtapose economic, environmental, and social concerns even when the respective performance dimensions are misaligned (Hahn et al., 2014). Firms adopting a paradoxical frame in their sustainable supply chain management might therefore be sincerely interested not just in minimizing SCSR, but in fostering supply chain sustainability performances more broadly. They would hence not prioritize the economic dimension, but be simultaneously interested in environmental, social, and governance performance. Such companies could expand the SCSR map developed in this study into a benefit map[3], arguing that the emphasis of sustainability is not only on avoiding harm, but also on doing better (Campbell, 2007). A benefit map could capture a country's propensity to fund environmental, social and governance initiatives (e.g., construction of parks and green spaces, support for elderly people, and sustainable construction of public buildings).

Another interesting possibility for future research is the empirical validation of the effectiveness of the SCSR map by companies from different industries (Brockhaus et al., 2013). It can be realized by using supplier self-disclosures, audit reports, and the frequency of negative sustainability-related incidents for suppliers from different countries. Moreover, further research should be conducted on stakeholder sensitivity in relation to SCSR (e.g., on how a

[3] We thank an anonymous reviewer for pointing out the idea of a benefit map.

sustainability issue becomes a risky sustainability issue), including the determinants that motivate stakeholders to punish buying firms for negative sustainability-related incidents in their upper supply chain.

We hope that the proposed SCSR map can efficiently inform buying firms about sustainability risks in their supply chains. This study has contributed towards complexity reduction in the context of SCSR assessment in order to facilitate more widespread scrutiny of SCSR by buying firms.

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Appendix 1: Data sources for existing software solutions

Software solution	Data source
Achilles	http://www.achilles.com/en/for-buyers/supply-chain-risk-and-performance-management
ChainPoint	http://chainpoint.com/de/
CSRware	http://csrware.com/sustainable-supply-chain-2/
Ecovadis	http://www.ecovadis.com/
Enablon	http://enablon.com/solutions/collaborative-supply-chain
Intertek	http://www.intertek.com/business-assurance/supplier-management/
RepRisk	https://www.reprisk.com/
Thinkstep SoFI	http://www.sofi-software.com/international/applications/sustainable-supply-chain/
Verisk Maple Croft	https://www.maplecroft.com/

Appendix 2: Data sources for the definition, measurement, and effectiveness of proxy variables

Proxy variable	Data source
Municipal recycling rate	http://unstats.un.org/unsd/environment/wastetreatment.htm
Share of total population served by municipal waste collection	http://unstats.un.org/unsd/environment/wastetreatment.htm
Share of companies with an environmental management system according to ISO 14001	http://www.iso.org/iso/iso14000
CO_2/million $ GDP	http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts1990-2013 http://edgar.jrc.ec.europa.eu/news_docs/jrc-2015-trends-in-global-co2-emissions-2015-report-98184.pdf
Water scarcity as a ratio of available to consumed water	http://waterriskfilter.panda.org/en/CountryProfiles#88/profile http://waterfootprint.org/media/downloads/Report53-GlobalBlueWaterScarcity.pdf

Gender wage gap (%)	https://goo.gl/2WKDb4 http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_324678.pdf
Share of children in child labor	http://www.ilo.org/ipec/facts/lang--en/index.htm http://www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipec/documents/publication/wcms_221513.pdf
Voice and accountability index	http://info.worldbank.org/governance/wgi/pdf/va.pdf https://goo.gl/BOMiIx
Trade union density rate	https://goo.gl/wKQX7hhttps://stats.oecd.org/Index.aspx?DataSetCode=UN_DEN http://www.oecd.org/employment/emp/UnionDensity_Sourcesandmethods.pdf
Collective bargaining coverage rate	https://goo.gl/wKQX7h http://laborsta.ilo.org/applv8/data/TUM/TUD%20and%20CBC%20Technical%20Brief.pdf
Share of workers in forced labor	http://www.ilo.org/global/topics/forced-labour/lang--en/index.htm
Frequency rate of non-fatal occupational injuries	https://goo.gl/0en42r http://laborsta.ilo.org/applv8/data/c8e.html
Frequency rate of fatal occupational injuries	https://goo.gl/0en42r http://laborsta.ilo.org/applv8/data/c8e.html
Labor inspection rate	https://goo.gl/uxJ1Dd http://www.ilo.org/labadmin/info/WCMS_141079/lang--en/index.htm#P10_2028
Working poverty rate (<$2/day)	http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_423670.pdf http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_243961.pdf
Share of employed persons working more than 48 hours per week	http://laborsta.ilo.org/ http://laborsta.ilo.org/applv8/data/travaile.html http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_104895.pdf
Weekly normal hours limit	http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_104895.pdf
Rule of law index	http://info.worldbank.org/governance/wgi/index.aspx#doc-sources https://papers.ssrn.com/sol3/papers.cfm?abstract_id=188568
Government effectiveness index	http://info.worldbank.org/governance/wgi/index.aspx#doc-sources https://papers.ssrn.com/sol3/papers.cfm?abstract_id=188568
World distribution of ISO 9001 certificates with regard to total domestic companies	http://www.iso.org/iso/home/standards/management-standards/iso_9000.htm http://www.iso.org/iso/pub100080.pdf
Bribe payers index	https://www.transparency.org/research/bpi http://info.worldbank.org/governance/wgi/index.aspx#doc-sources

Control of corruption index	https://www.transparency.org/country/#CHN https://www.oecd.org/dac/governance-peace/publications/FINAL%20Addressing%20corruption%20together.pdf
Ratification share of the 18 International Human Right Treaties	http://indicators.ohchr.org/Stock/Documents/MetadataRatificationTotal_Dashboard.pdf
Accreditation of national human rights institutions	http://www.ohchr.org/Documents/Issues/HRIndicators/MetadataNHRIAccreditation.pdf

CHAPTER 3 – INCREASING FIRM PERFORMANCE THROUGH SUSTAINABLE REPUTATION: A STUDY ON BUYER-SUPPLIER RELATIONSHIPS

Abstract

Supplier evaluation is a crucial issue for buying firms. Suppliers are generally assessed according to multiple criteria, whereby the evaluation results can influence their performance. Today, buying firms also integrate sustainability aspects in their supplier evaluation due to intense stakeholder scrutiny. Against this background, this study investigates to which extent a reputation for sustainable business conduct can be translated into a competitive advantage for the supplier. We employ longitudinal regression analysis for 4,107 suppliers over the five years from 2011 to 2015 to analyze whether a reputation for sustainable business conduct leads to better supplier performance. Moreover, traditional evaluation criteria (cost, quality, delivery reliability, technology) are considered as influencing variables. The study contributes to the scarce empirical literature on supplier sustainability as a means to obtaining a competitive advantage. Moreover, it augments the resource-based view by distinguishing between the supplier's internal sustainability reputation (i.e., being regarded as conforming to buying firm internal sustainability expectations) and the supplier's external sustainability reputation (i.e., being known for conforming to external sustainability standards with regard to the law and stakeholder requirements). According to our results, both forms of reputation complement each other and can be considered as resources resulting in a competitive advantage.

Keywords: supplier reputation; supply chain sustainability; supplier performance; resource-based view; longitudinal regression analysis

1. Introduction

Nowadays, buying firms have to rely on numerous suppliers (Hitt et al., 2016b). Therefore, they have to make thoughtful and efficient supplier evaluation decisions to build an effective supply chain (Chen, 2011). Supplier evaluation can improve the communication and justification of purchasing decisions and push both the suppliers and the buying firms to achieve better performance (Högl and Wagner, 2005; Petersen et al., 2005).

With the help of modern information and communication technologies, buying firms have the technical possibility to effectively evaluate their suppliers according to multiple criteria (Ho et al., 2010). The most popular criteria are quality, delivery reliability, and price/cost (Ho et al., 2010). Nevertheless, due to elevated stakeholder pressure, numerous buying firms have also begun integrating measures of sustainability in their supplier evaluation initiatives (Reuter et al., 2010). This is the case since having reputable suppliers concerning sustainability helps buying firms to establish a sustainable reputation for themselves (Homburg et al., 2013). In this vein, we view reputation as a "global perception of the extent to which an organization is held in high esteem or regard" (Weiss et al., 1999, p. 75). Consequently, a supplier's sustainability reputation reflects the position in which the buying firm sees the supplier relative to its competitors concerning the sustainability topic (Roberts and Dowling, 2002; Rindova et al., 2005).

There is recent evidence, for instance from the oil and gas company Shell which was amongst others highly criticized for its expensive drilling in Alaska, or from the food processing company Nestlé which was amongst others highly praised due to its efforts in addressing climate change, that NGO criticism and praise have an impact on an organizations profit (The Guardian, 2016). This indicates that buying firms want to protect their own performance by cooperating with suppliers with a sustainable reputation (Busse, 2016).

Since the establishment of a sustainable reputation is costly (Robinson et al., 2011), the following research question arises from the perspective of the supplier: *To which extent can a reputation for sustainable business conduct be translated into a competitive advantage?* More specifically, the question emerges whether investments that foster a sustainable reputation lead to a better performance in the form of a higher order volume of the buying firm (Pagell and Gobeli, 2009).

To answer our research question, we employ a longitudinal regression analysis, based on data from 4,107 suppliers of a German technology firm over the five years from 2011 to

2015. The theoretical lens for our study is the resource-based view (RBV), which aims to understand the sources of competitive advantage for firms (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). To the best of our knowledge, our paper is the first empirical study analyzing whether a sustainable reputation can constitute a competitive advantage in buyer-supplier relationships. By distinguishing between the supplier's internal sustainability reputation (i.e., being regarded as conforming to buying firm internal sustainability expectations) and the supplier's external sustainability reputation (i.e., being known for conforming to external sustainability standards with regard to the law and external stakeholder requirements), we also augment the RBV.

We structure the remainder of this paper into five major sections: In the next section, we describe the RBV as the theoretical lens of the study and develop our hypotheses. In the third section, we present our research method, namely the sample, relevant measures, descriptive statistics and model of our study. The fourth section lays out the results and robustness checks. We conclude this paper with a summary of the study, its scholarly and practical contributions, the limitations of this work and possibilities for future research.

2. Theoretical background and hypotheses

2.1. A resource-based view on sustainable reputation

Understanding the sources of competitive advantage for firms represents a significant area of research in the field of operations management (Ketokivi, 2016). A firm is said to possess a competitive advantage when it is implementing a value creating strategy that leads to superior performance in comparison to competitors (Porter, 1985). The RBV examines the link between a firm's resource configuration and its competitive advantage (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). Operations management researchers have recently discussed its application in detail (e.g., Bromiley and Rau, 2016; Hitt et al., 2016a; Hitt et al., 2016b). It explains long-lived differences in firm performance that cannot be attributed to differences in industry conditions (Peteraf, 1993). The RBV builds on two assumptions (Barney, 1991): First, firms within an industry may be heterogeneous concerning the strategic resources they control. Second, resources may not be perfectly mobile across firms, and thus heterogeneity can be long-lasting. Resources such as a reputation for sustainable business conduct are immobile because of their idiosyncratic or firm-specific nature; therefore, they are certainly heterogeneous (Peteraf, 1993).

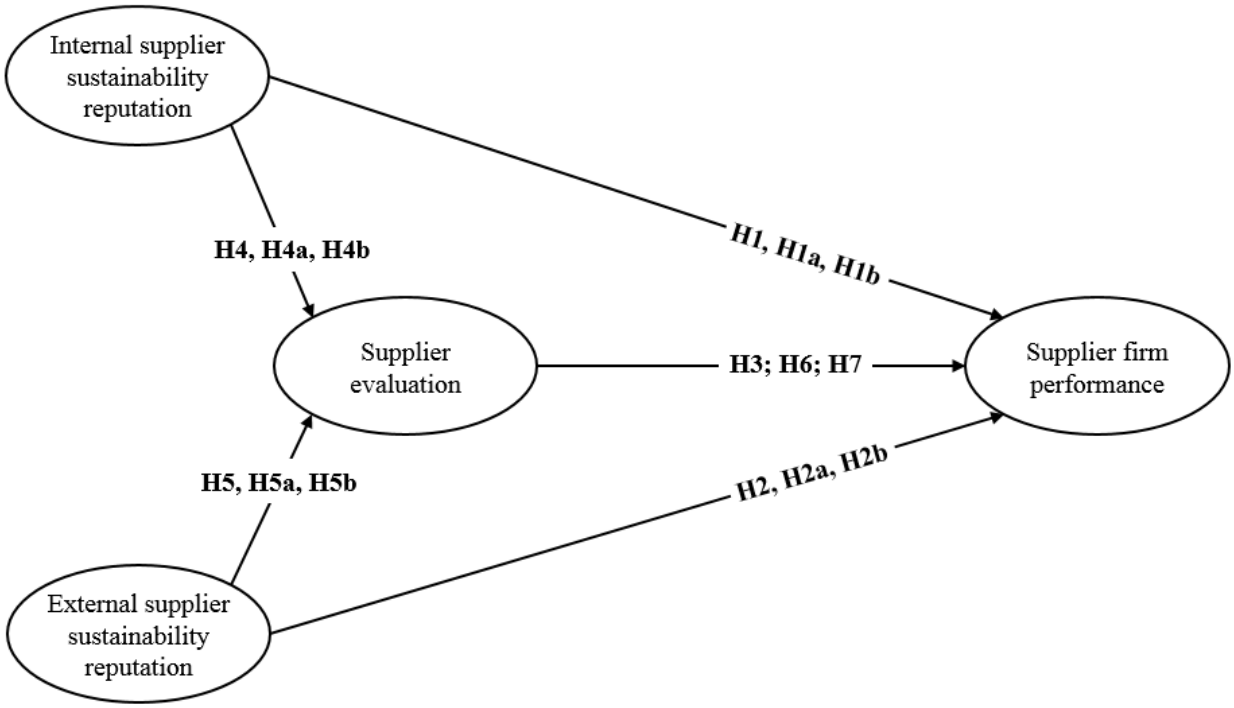
Firm resources are strengths that firms can use to conceive of and implement their strategies which improve their efficiency and effectiveness (Learned et al., 1969; Porter, 1981). Researchers classify the numerous possible firm resources into three categories. Physical capital resources include for instance the physical technology used in a firm, a firm's plant and equipment and its geographic location (Williamson, 1975). In contrast, human capital resources incorporate for example the training, experience, and relationships of individual managers and workers in a firm (Becker, 1964). Finally, organizational capital resources comprise for instance informal relations among groups within a firm and informal relations between a firm and actors in its environment (Tomer, 1987). A firm's reputation for sustainable business conduct falls into this third category.

In general, organizational capital resources like a reputation for sustainable business conduct are more likely to lead to competitive advantage since they are intangible (Hitt et al., 2006). More specifically, to facilitate a competitive advantage, a firm resource must fulfill four conditions, whose acronyms are often linked to the coinage "VRIN" (Barney, 1991; Peteraf, 1993). We describe these factors in the following for a reputation for sustainable business conduct: (1) One must agree that a reputation for sustainable business conduct is valuable (V) in the sense that it presents opportunities for recognition and neutralizes threats about reputational damage. (2) If only a few competing firms have a reputation for sustainable business conduct compared to the current and potential competition, then the resource is rare (R). (3) A reputation for sustainable business conduct is imperfectly imitable (I) since its development depends upon specific, difficult-to-duplicate historical settings (Dierickx and Cool, 1989). Also, positive firm reputations can be thought of as informal social relations between firms and key stakeholders (Klein and Leffler, 1981). Such informal relations are likely to be socially complex, and thus imperfectly imitable (Porter, 1980; Wernerfelt, 1984). In this context, Rumelt (1984) coined the term "isolating mechanisms" to relate to aspects of organizations, which are imperfectly imitable. Isolating mechanisms include amongst others a firm's reputation (Rumelt, 1987). (4) The question whether a reputation for sustainable business conduct is non-substitutable (N) is complicated. Klein et al. (1978) have suggested that rather than developing a positive reputation, firms may reassure their customers or suppliers with long-term contracts. However, given the fact that some suppliers invest in *both* a reputation for sustainable business conduct and long-term contracts, we assume that a reputation for sustainable business conduct is non-substitutable (Barney, 1991).

Approximately one of every twelve articles published in operations management uses the RBV or a derivative for its theoretical underpinnings (Hitt et al., 2016b). For instance, recent RBV application examples include Barney (2012) who argues that supply chains can contribute to competitive advantage, Sodhi (2015) who conceptualizes social responsibility through a combination of the RBV and stakeholder theory, and Lam et al. (2016) who analyze the influence of firms' social media campaigns on firm efficiency and innovativeness.

2.2. Firm performance

The RBV suggests a direct link between competitive advantage and firm performance (Barney, 1991). Therefore, numerous recent management studies have operationalized competitive advantage through firm performance (e.g., Chadwick et al., 2015; Lioukas et al., 2016; Roh et al., 2016). Firm performance is the paramount dependent variable of interest for management researchers and managers since its measurement enables us to evaluate particular actions of both firms and managers and to study how firms evolve over time, and ultimately also because it ensures firm survival (Richard et al., 2009). Amongst the studies published by four leading management journals from 1998 to 2000, firm performance was the most frequently used dependent variable (Boyd et al., 2005). Figure 3 summarizes the hypothesized relationships to our research model concerning the dependent variable firm performance.



Note:
H6 and H7 depict the mediating hypotheses.

Figure 3: Research model

2.3. Effects of internal and external sustainability reputation on supplier firm performance

An organization´s reputation represents one of its most important resources (Flanagan and O'Shaughnessy, 2005, p. 445). Nevertheless, the development of a good reputation takes considerable time and depends on a firm making stable and consistent investments (Roberts and Dowling, 2002; Shamsie, 2003). Firms develop their reputation by three goals: general favorability, being known and being known for something (Lange et al., 2011). The latter goal suggests that organizations do not only have a general reputation but also a reputation concerning different topics. In this case, the supplier's sustainability reputation reflects the intention of the supplier to be known for sustainable business conduct by its buying firm (Rindova and Petkova, 2007).

Business leaders and entrepreneurs embracing sustainability are focused on optimizing the profits of the firm while ensuring positive impacts (and/or reducing negative impacts) of the firm's business on the planet and society at large (Letizia and Hendrikse, 2016). A firm can create a certain level of sustainability by using resources in a sustainable manner in its processes

(e.g., no child labor or forced labor) or by embodying its products with sustainable attributes (e.g., pesticide-free or non-animal tested ingredients) (McWilliams and Siegel, 2001).

Buying firms are exposed to increased pressure from internal stakeholders (e.g., employees) and external stakeholders (e.g., customers) who expect that they uphold a sustainable reputation (Gioia et al., 2000; Aguilera et al., 2007). Thereby, buying firms act responsibly with regard to sustainability when they "do not knowingly do anything that could harm their stakeholders'' and they "rectify it whenever the harm is discovered and brought to their attention'' (Campbell, 2007, p. 951). Accordingly, they must include sustainability in their corporate strategy decisions and, in doing so, verify that sustainable operations (i.e., absence of environmental and social misconduct) exist at their suppliers' premises, irrespective of the spend volume with a supplier or its strategic relevance to the buying firm (Reuter et al., 2010). This is necessary since irresponsible supplier behavior of any kind may be extended to the buying firm, causing adverse publicity, reputational damage and costly legal obligations (Carter and Jennings, 2004; Pagell and Wu, 2009). Therefore, buying firms are interested in ordering more from suppliers with a favorable sustainability reputation (McWilliams and Siegel, 2001; Reuter et al., 2010). This is especially the case since the supply base of many Western buying firms has become increasingly global and spend volumes have shifted towards developing countries that are riskier regarding noncompliance to Western sustainability standards (Reuter et al., 2010).

Journalists often provide free publicity of a firm's commitment or lack of commitment to sustainability for stakeholders (McWilliams and Siegel, 2001). Moreover, both internal and external stakeholders have access to buying firms' and their suppliers' publicly available annual sustainability reports. In those reports, the companies communicate their actions to address sustainability (Tate et al., 2010). Nevertheless, sustainability reports are often biased since general management sees them as a way to advertise sustainability. Therefore, for internal stakeholders, buying firms utilize supplier code of conducts, supplier self-disclosures and supplier audits to ensure that the supplier meets their sustainability standards (Schurr and Ozanne, 1985; Erwin, 2011). However, external stakeholders do not have access to these control instruments, leading to an asymmetric information structure (McWilliams and Siegel, 2011). As a result, internal and external stakeholders can have a different perception of a supplier's sustainable image (Hertwich et al., 2009). Consequently, in contrast to most studies that focus on only one type of sustainable reputation, we develop a more nuanced understanding of this concept. Drawing on the distinction between internal sustainability-related decision

making and external sustainability reporting (Henri and Journeault, 2010), we suggest two differentiating manifestations of a supplier's sustainability reputation, namely an internal (i.e., relationship-specific) and an external (i.e., relationship-unspecific) form of sustainability reputation. The former represents the supplier's reputation for sustainable business conduct about the specific internal requirements of the buying firm (Rao, 1994; Deephouse and Carter, 2005). The latter captures the degree to which the supplier is believed to satisfy legal sustainability standards and external stakeholder requirements concerning sustainability (Tolbert and Zucker, 1999; Thornton, 2002).

In sum, having reputable suppliers concerning sustainability helps buying firms to establish a sustainable reputation for themselves (Homburg et al., 2013). Even if stakeholders detect misconduct of a supplier with a highly sustainable reputation, buying firms can exculpate themselves by referring to the formerly positive supplier reputation. Consequently, a supplier's reputation for sustainable business conduct is a vital protection measure for the buying firm. As a result, suppliers which pursue activities not solely focused on economic return, but also consider their reputation concerning the environment and society, will attain a long-term competitive advantage (e.g., Hart, 1995). Reflecting the arguments presented above and distinguishing between the supplier's internal and external sustainability reputation, we state the following two hypotheses:

Hypothesis 1: The better the supplier's internal sustainability reputation, the higher the supplier's firm performance.

Hypothesis 2: The better the supplier's external sustainability reputation, the higher the supplier's firm performance.

With respect to these two hypotheses also two competing views on the effects of the supplier's internal and external reputation on the supplier's performance arise. The question is whether suppliers only benefit from increasing firm performance until they reach a minimum performance with regard to sustainable reputation (warding-off-reputation-risks view) or whether every incremental increase in sustainable reputation leads to a higher firm performance of the supplier (reputation-as-VRIN-resource view) (Pierce and Aguinis, 2013; Busse et al., 2016). Figure 4 also depicts these competing views.

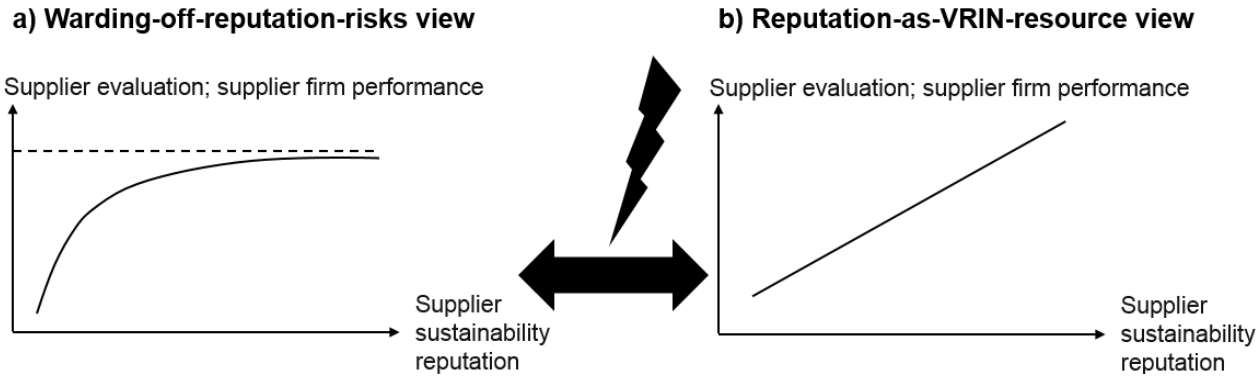


Figure 4: Competing views concerning the effect of supplier sustainability reputation

By addressing this question, we also respond to Aguinis and Edwards' (2014, pp. 146-147) first wish for the next decade: "(…) empirical results are rarely drawn upon to calibrate theoretical hypotheses to predict the *magnitude* of an effect, and in like fashion, the directional hypotheses set forth by theories provide little reason to conduct statistical tests that detect anything other than differences from zero (…). Research that follows this cycle is caught in a trap that yields little theoretical progress, because theories are stated with such imprecision that they are difficult to refute (…). Ways to refine theoretical predictions include (…) explicitly stating whether relationships are expected to be *linear versus curvilinear*". Consequently, with our above-described distinction between the supplier's internal and external sustainability reputation, the hypotheses 1 and two are refined as competing hypotheses in the following way:

> *Hypothesis 1a: The effect of the supplier's internal sustainability reputation on the supplier's firm performance exhibits linear or increasing marginal returns (the function is linear or convex): As the supplier's internal sustainability reputation increases, its contribution to the supplier's firm performance stays the same or increases.*
>
> *Hypothesis 1b: The effect of the supplier's internal sustainability reputation on the supplier's firm performance exhibits diminishing marginal returns (the function is concave): As the supplier's internal sustainability reputation increases, its contribution to the supplier's firm performance decreases.*
>
> *Hypothesis 2a: The effect of the supplier's external sustainability reputation on the supplier's firm performance exhibits linear or increasing marginal returns (the function is linear or convex): As the supplier's external sustainability reputation increases, its contribution to the supplier's firm performance stays the same or increases.*

Hypothesis 2b: The effect of the supplier's external sustainability reputation on the supplier's firm performance exhibits diminishing marginal returns (the function is concave): As the supplier's external sustainability reputation increases, its contribution to the supplier's firm performance decreases.

2.4. Direct and mediating effects of supplier evaluation

Supplier evaluation is a crucial consideration for buying firms since having the wrong supplier can deteriorate the whole supply chain's financial and operational performance (Wagner et al., 2012). It requires the consideration of multiple, possibly conflicting performance criteria, whereby the most widespread ones are quality, delivery reliability and cost (Ho et al., 2010). The presence of clear criteria upon which the selection is based also pushes the suppliers to achieve better performance (Kannan and Tan, 2002). This can have a positive effect on the whole supply chain, as in their effort to improve their performance for fulfilling the buying firm's selection criteria, first-tier suppliers could adopt similar criteria towards their own suppliers.

Against this background, the goal of the buying firm is to identify distinctions in performance between suppliers and to offer feedback information to suppliers through supplier evaluation. In that sense, it is in the interest of the buying firm to order more from suppliers with a favorable evaluation since they provide good quality and delivery reliability combined with a reasonable cost. Therefore, we state the following hypothesis:

Hypothesis 3: The better the supplier's evaluation, the higher the supplier's firm performance.

In recent years, the approach to traditional supplier evaluation criteria has changed to reflect new stakeholder requirements (Ho et al., 2010). Nowadays, buying firms also consider sustainability aspects such as a supplier's reputation for sustainable business conduct (Ha and Krishnan, 2008). This is the case since they want to create incentives for their suppliers to enhance their sustainability (Letizia and Hendrikse, 2016). The supply chain literature has only recently addressed the problem of incentivizing sustainability activities, also focusing on the aspect of rewarding sustainability efforts of suppliers through a positive supplier evaluation by the buying firm (Kim, 2015). This means that suppliers with a favorable sustainability reputation can be honored by the buying firm through a positive evaluation result. Considering the above distinction between the supplier's internal and external sustainability reputation, we propose the following hypotheses:

Hypothesis 4: The better the supplier's internal sustainability reputation, the more favorable the supplier's evaluation.

Hypothesis 5: The better the supplier's external sustainability reputation, the more favorable the supplier's evaluation.

Moreover, when again including the analysis of both linear and curvilinear effects of a sustainable reputation, these two hypotheses are refined as competing hypotheses in the following way:

Hypothesis 4a: The effect of the supplier's internal sustainability reputation on the supplier's evaluation exhibits linear or increasing marginal returns (the function is linear or convex): As the supplier's internal sustainability reputation increases, its contribution to the supplier's evaluation stays the same or increases.

Hypothesis 4b: The effect of the supplier's internal sustainability reputation on the supplier's evaluation exhibits diminishing marginal returns (the function is concave): As the supplier's internal sustainability reputation increases, its contribution to the supplier's evaluation decreases.

Hypothesis 5a: The effect of the supplier's external sustainability reputation on the supplier's evaluation exhibits linear or increasing marginal returns (the function is linear or convex): As the supplier's external sustainability reputation increases, its contribution to the supplier's evaluation stays the same or increases.

Hypothesis 5b: The effect of the supplier's external sustainability reputation on the supplier's evaluation exhibits diminishing marginal returns (the function is concave): As the supplier's external sustainability reputation increases, its contribution to the supplier's evaluation decreases.

With hypotheses 3, 4 and 5, we assume that a reputation for sustainable business conduct manifests itself in a positive supplier evaluation during the supplier evaluation process, before it ultimately leads to better supplier performance. Accordingly, with the previously described distinction between the supplier's internal and external sustainability reputation, we state the following mediation hypotheses (Rungtusanatham et al., 2014):

Hypothesis 6: The supplier's evaluation mediates the effect of the supplier's internal sustainability reputation on the supplier's firm performance.

Hypothesis 7: The supplier's evaluation mediates the effect of the supplier's external sustainability reputation on the supplier's firm performance.

3. Research method

3.1. Sample

We obtained our data directly from the analyzed buying firm, which is a globally active multi-divisional German technology firm. With a firm age of over 150 years, around 20,000 employees and sales of over four billion Euro, it is well established in its business area. We collected longitudinal data from 4,107 suppliers for the five years from 2011 to 2015. The longitudinal structure of our data is essential since buyer-supplier relationships are dynamic over time, and the behavior of one party can continuously impact the behavior of the other party (e.g., Jap and Ganesan, 2000; Medlin, 2004). Despite its potential for answering questions of causality, scarce longitudinal research of buyer-supplier collaboration exists (Cousins et al., 2006; Cousins and Menguc, 2006).

The studied suppliers are distributed among 45 developed and developing countries, ranging from 1 to 2,376 suppliers per country. Table 11 shows the distribution of the suppliers according to countries. Since the analyzed technology corporation is located in Germany, most of its suppliers are located there as well (57.85%). However, there is also a considerable number of suppliers based in the developing countries Brazil (13.05%) and China (10.57%) and in the developed countries Austria (7.26%), Italy (2.05%), Switzerland (1.58%), and United States (1.07%). The category "Others" captures 270 suppliers from 38 different countries, each of which accounts for less than one percent of the overall suppliers.

Table 11: Breakdown of suppliers according to countries

Supplier country*	Number	Percentage	Cumulative percentage
Germany	2376	57.85	57.85
Brazil	536	13.05	70.9
China	434	10.57	81.47
Austria	298	7.26	88.73
Italy	84	2.05	90.78
Switzerland	65	1.58	92.36
United States	44	1.07	93.43
Other (38 different countries)	270	6.57	100

*In the case of multi-national supplier companies, we selected the country of the production site from which the supplier delivers to the buying firm

We also analyzed the sustainability communication of the buying firm from 2011 to 2010. In each year, the buying firm published a publicly available sustainability report, whereby the structure and the content of these reports remained similar. Therefore, it can be assumed that the sustainability communication remained stable for our timeframe of analysis.

3.2. Measures

Overall, we employ eight different variables for this study. Table 12 shows the observations for these study variables.

Table 12: Observations for the study variables

Variable	Observations	Minimum	Maximum
Ln (Order volume)	20,535	0	17.04
Internal supplier sustainability reputation	8,795	0	4
External supplier sustainability reputation	8,795	0	4
Supplier evaluation	10,944	0	4
Growth of Ln (Order volume) (%)	16,428	-66.43	1671.42
Supplier country HDI	20,535	0.54	0.95
Supplier self-disclosure	20,535	0	1
Collaboration length	20.535	1	33
Year	5	2011	2015

Researchers measure firm performance in different ways. Richard et al. (2009) showed that 26% of all papers in a sample of leading management journals operationalized firm performance as the dependent variable through sales, market share, or a related measure. Moreover, researchers measure firm performance in 38% of all cases by applying a single indicator (Boyd et al., 2005). Against this background, the buying firm's order volume represents an appropriate sales-oriented measure of the supplier´s performance at the level of analysis of the buyer-supplier relationship (Wagner et al., 2011). Therefore, to assess the competitive advantage of the studied suppliers, we measure the buying firm's order volume with regard to the supplier as dependent variable. In doing so, we apply the natural logarithm of order volume to linearize the relationship with the independent variables (Cohen et al., 2003). In the case of no order volume of the buying firm from a supplier in a specific year, we set the natural logarithm of the dependent variable order volume to zero. Performance measures should cover a time span, which must be subdivided into a sufficient amount of time periods (Boulding, 1990; Richard et al., 2009). Against this background, we subdivide the order volume of the buying firm from the supplier, which covers a time span of five years, in five yearly time periods.

We employ three continuous independent variables for this study, one of which also serves as a mediator. Table 13 provides an exact definition of these variables. Their measurement through the buying firm did not change over the timeframe of analysis.

Table 13: Definition framework for the independent variables

Independent variable	Definition
Internal supplier sustainability reputation*	Perceived supplier compliance to buying firm internal standards regarding the environment, occupational health, and safety, as well as social issues for all products and services provided.
External supplier sustainability reputation*	Perceived supplier compliance with external standards such as legal regulations and external stakeholder requirements regarding the environment, occupational health and safety, as well as social issues for all products and services provided.
Supplier evaluation	Perceived supplier adherence to cost (30-42%), quality (23-25%), delivery reliability (15-25%) and technology (20-22%) criteria. The relative importance of the specific criteria (in %) varies slightly between the different divisions of the buying firm. • The buying firm aims to minimize the total cost of all products and services provided and to realize the best possible price level worldwide. Supplier openness for efficient cost reduction concepts and continuous process improvement are critical concerns in this area. • The buying firm expects to be only supplied with faultless products and excellent services. All suppliers are requested to enhance the quality of their products and services in such way that the requirements of the buying firm are entirely and permanently met. • Buying firm customers expect correct deliveries at the right time and simultaneously that changes can be handled with the highest possible flexibility. To realize this, the buying firm has to lay down the same requirements towards its suppliers. Consequently, the expectation of the buying firm is hundred percent delivery reliability with short delivery times, and that suppliers adhere to their commitments. • The buying firm expects that its suppliers are leading in their business areas and show willingness for collaborative engineering. Intensive cooperation is expected throughout the whole product lifecycle.

*We refer to reputation and not performance in this case since we measure the perceived compliance and not the actual one

The first independent variable is the supplier's internal sustainability reputation, rated on a five-point scale. All responsible purchasing agents and employees in the quality management department of the buying firm are possible raters, leading to a range of 1 to 85 employee ratings per supplier per year. The variable captures the perceived compliance to buying firm internal sustainability standards. The supplier's external sustainability reputation represents our second independent variable, which is assessed on the same five-point scale as the internal

sustainability reputation. The background and the number of the raters are also the same. However, in this case, the variable reflects the perceived compliance with external sustainability standards. The supplier's evaluation serves as third independent variable and mediator. All integer values on the scale are possible evaluation results. The rating criteria include the common variables cost, quality, and delivery reliability. Also, due to its industry affiliation, the buying firm includes the technology aspect in this rating. The purchasing group managers of the buying firm decide who among the purchasing agents should rate a supplier. Between one and seven employees rate a supplier per year. In doing so, they can rely on the buying firm's SAP system for technical criteria (e.g., the supplier's adherence to delivery dates).

We also scrutinized the influences of several control variables. We controlled for the year-specific human development index (HDI) of a supplier's country since institutions can influence the resources available to the suppliers in a country (Holmes et al., 2013). Moreover, country-specific laws and regulations (e.g., regarding the management of human resources) may affect the buying firm's decisions (Batjargal et al., 2013). We also controlled for the collaboration length between the buying firm and the supplier and the yearly availability of a supplier self-disclosure because long-term relationships and declaring to agree with the buying firm's supplier code of conduct might have a positive effect on the buying firm's order volume from the supplier (Jiang, 2009). Furthermore, we added the yearly growth of the order volume from a supplier as a control variable. We assume that high growth rates of order volume significantly raise the total order volume from the supplier and, in this way, the importance of the supplier for the buying firm. Lastly, we control for changes in economic conditions and policies by including year-fixed effects (e.g., Ton and Raman, 2010; Martin et al., 2015).

3.3. Descriptive statistics

Table 14 shows the descriptive statistics and correlations for the study variables. The high values for the mean and standard deviation of the variable "Order volume growth" result from the project-related ordering behavior of the buying firm. Unsurprisingly, the highest found correlation was 0.81 for the variables internal sustainability reputation and external sustainability reputation.

Table 14: Descriptive statistics and correlations

	Mean	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Ln (Order volume)	9.21	4.48								
2. Internal supplier sustainability reputation	3.15	0.67	0.13***							
3. External supplier sustainability reputation	3.16	0.66	0.14***	0.81***						
4. Supplier evaluation	3.05	0.45	0.16***	0.36***	0.35***					
5. Growth of Ln (Order volume) (%)	1.21	20.39	0.14***	0.02	0.03**	0.04***				
6. Supplier country HDI	0.87	0.08	0.04***	-0.15***	-0.13***	0.03**	-0.02*			
7. Supplier self-disclosure	0.02	0.13	0.02**	-0.01	0.00	-0.05***	0.01	0.06****		
8. Collaboration length	12.61	8.19	0.12***	0.00	0.01	0.00	0.00	0.48***	0.03***	
9. Year	2013	1.41	0.00	0.28***	0.30***	0.11***	-0.05***	0.07***	0.00	0.17***

N=4,107 suppliers; *p≤ 0.05, **p≤ 0.01, ***p≤ 0.001

To make sure that the supplier's internal sustainability reputation is not fully explained through the supplier's external sustainability reputation, we also analyzed the correlation between the supplier's external sustainability reputation in the year (t-1) and the supplier's internal sustainability reputation in the year (t). This lagged analysis revealed that the correlation coefficient for these two sustainability measures amounts to only 40.03%, providing evidence that they should be considered separately.

3.4. Model

We utilize a three-stage longitudinal OLS regression with fixed effects for suppliers and years to test our model in Stata (e.g., Ton and Raman, 2010; Martin et al., 2015; Lam et al., 2016). This technique provides very reliable and efficient estimates of parameters in comparison to other methods (Kennedy, 1998; Hayes, 2013). The choice for the fixed effects model over the random effects model was made by relying on the significance of the Hausman test ($\chi 2(11)=205.37$; $p \leq 0.001$) (Hausman, 1978). The equation (1) for the longitudinal regression model becomes:

$$Ln\ (OrderVolume)_{i(t+1)} = \beta_1 * SupplierInternalSustainabilityReputation_{it} + \beta_2 * SupplierExternalSustainabilityReputation_{it} + \beta_3 * SupplierEvaluation_{it} + \beta_4 X_{it} + a_i + e_{it} \quad (1)$$

To test for mediation, we additionally derive the following longitudinal regression model with the suppliers' evaluation as the dependent variable (2):

$$SupplierEvaluation_{it} = \beta_1 * SupplierInternalSustainabilityReputation_{it} + \beta_2 * SupplierExternalSustainabilityReputation_{it} + \beta_4 X_{it} + a_i + e_{it} \quad (2)$$

For both models, β is the coefficient for the independent variables, X_{it} is the vector of control variables for each supplier i and each time period t , a_i is the unknown intercept for each supplier i, and e_{it} is the error term for each supplier i and each time period t (i=1...4,107; t=1…5).

4. Results

Model SE1 to SE3 lay out the effects of the supplier's internal and external sustainability reputation on the dependent variable supplier evaluation. Model SE1 contains the control variables only. We focus on model SE2 (standard predictors included) when analyzing the linearity of the relationship between supplier sustainability reputation and supplier evaluation, and on model SE3 (squared predictors included) when focusing on curvilinear effects in the same model. With model SE2 we can explain 11.05% of the variance in supplier evaluation, and with model SE3 the explained variance, which amounts to11.32% is even higher. In contrast, model OV1 to OV3 show the effects of both, the supplier's internal and external sustainability reputation, and the supplier's evaluation on the dependent variable order volume. Again, model OV1 covers only the control variables, whereas model OV2 investigates the linearity and model OV3 the curvature of the relationship. In this case, model OV2 explains 10.49% and model OV3 even 10.73% of the variance. Table 15 and Table 16 display the results of the longitudinal regression analyses.

Table 15: Regression results for supplier evaluation

	Supplier evaluation		
	SE1	**SE2**	**SE3**
Study variables			
Internal supplier sustainability reputation		0.09*** (0.02)	0.09*** (0.02)
(Internal supplier sustainability reputation)^2			-0.01 (0.02)
External supplier sustainability reputation		0.13*** (0.02)	0.14*** (0.02)
(External supplier sustainability reputation)^2			0.05** (0.02)
Control variables			
Growth of Ln (Order volume) (%)	0.00* (0.00)	0.00 (0.00)	0.00 (0.00)
Supplier country HDI	4.51** (1.60)	6.71 (1.67)***	6.11 (1.67)***
Supplier self-disclosure	2.00*** (0.01)	2.06*** (0.01)	2.06*** (0.01)
Collaboration length	0.04*** (0.01)	0.01 (0.01)	0.01 (0.01)
Intercept	-1.37 (1.31)	-3.49* (1.34)	-3.03* (1.36)
Observations	9,146	8,647	8,647
R^2	0.0375	0.1105	0.1132
ΔR^2	0.0375	0.0730	0.0027
F-statistics	33.91***	73.46***	60.35***

Robust standard errors in parenthesis; fixed effects for suppliers and years; N=4,107 suppliers with yearly ratings; *p≤ 0.05, **p≤ 0.01, ***p≤ 0.001

Table 16: Regression results for firm performance

	Ln (Order volume)		
	OV1	**OV2**	**OV3**
Study variables			
L.(Internal supplier sustainability reputation)		-0.04 (0.19)	-0.11 (0.18)
L.(Internal supplier sustainability reputation)^2			-0.34 (0.18)
L.(External supplier sustainability reputation)		1.15*** (0.19)	1.24*** (0.19)
L.(External supplier sustainability reputation)^2			0.45* (0.21)
L.(Supplier evaluation)		0.93*** (0.23)	0.93*** (0.23)
Control variables			
Growth of Ln (Order volume) (%)	0.03** (0.01)	0.04*** (0.00)	0.04*** (0.00)
Supplier country HDI	4.49 (11.68)	-32.79 (25.68)	-35.98 (25.83)
Supplier self-disclosure	5.05*** (0.29)	4.20*** (0.27)	4.21*** (0.27)
Collaboration length	-0.26*** (0.05)	-0.23 (0.18)	-0.24 (0.18)
Intercept	8.69 (9.63)	35.49 (21.44)	38.35 (21.53)
Observations	16,428	7,250	7,250
R^2	0.0384	0.1049	0.1073
ΔR^2	0.0384	0.0665	0.0024
F-statistics	81.88***	45.44***	38.12***

Robust standard errors in parenthesis; fixed effects for suppliers and years; N=4,107 suppliers with yearly ratings; L. = Lagged effects included; *p≤ 0.05, **p≤ 0.01, ***p≤ 0.001

Multicollinearity is not a concern in all models since the maximum obtained variance inflation factor (3.11) is below the often reported cut-off value of 10 (Neter et al., 1996). Our analysis shows that the data suffer from heteroscedasticity (p≤ 0.001) (Greene, 2008). Therefore, we estimate our results with robust standard errors (Wooldridge, 2002).

4.1. Effects on order volume and supplier evaluation

Model OV2 shows that due to the insignificance of the direct effect of the supplier's internal sustainability reputation on the buying firm's order volume, hypothesis 1 and the related competing hypotheses 1a and 1b cannot be supported.

Nevertheless, with model OV2, we accept hypothesis 2 and 3, indicating that the supplier's external sustainability reputation (β=1.15; p≤ 0.01) and evaluation (β=0.93; p≤ 0.001) positively affect the supplier's performance. The coefficients for all effects must be interpreted carefully since we use the natural logarithm of the dependent variable order volume. For example, a one-point increase of the supplier's external sustainability reputation on the scale between 0 and 4 enhances the order volume by a considerable amount of 216% (exp(β_1)=exp(1.15)-1=2.16). In the same vein, a one-point increase of the supplier's evaluation on the scale between 0 and 4 enhances the order volume by an amount of 153% (exp(β_3)=exp(0.93)-1=1.53). Concerning the competing hypotheses, model OV3 shows that we can accept hypothesis 2a, since as the supplier's external sustainability reputation increases its contribution to the supplier's performance increases (β=0.45; p≤ 0.05). Consequently, we reject the opposing hypothesis 2b. Figure 5 provides graphical evidence for the curvilinear relationship.

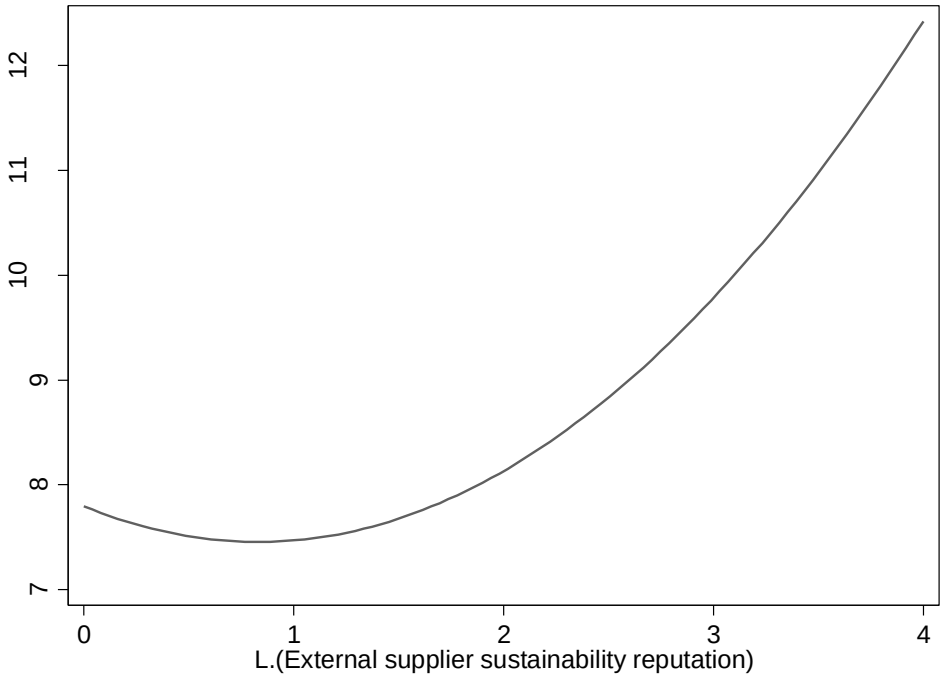


Figure 5: Lagged effect of the supplier's external sustainability reputation on the buying firm's order volume

By confirming hypotheses 4 and 5 through Model SE2, we show that both the supplier's internal (β=0.09; $p \leq 0.001$) and external sustainability reputation (β=0.13; $p \leq 0.001$) positively impact the supplier's evaluation. When considering the competing hypotheses with model SE3, we can accept hypotheses 4a demonstrating that as the supplier's internal sustainability reputation increases, its contribution to the supplier's evaluation stays the same. Therefore, we reject the contrasting hypothesis 4b. Also, with regard to the competing hypotheses, we find evidence for hypothesis 5a, validating that when the supplier's external sustainability reputation increases, its contribution to the supplier's evaluation increases (β=0.05; $p \leq 0.01$). Hence, we reject the opposing hypothesis 5b. Figure 6 graphically illustrates the relationship which was found to be curvilinear.

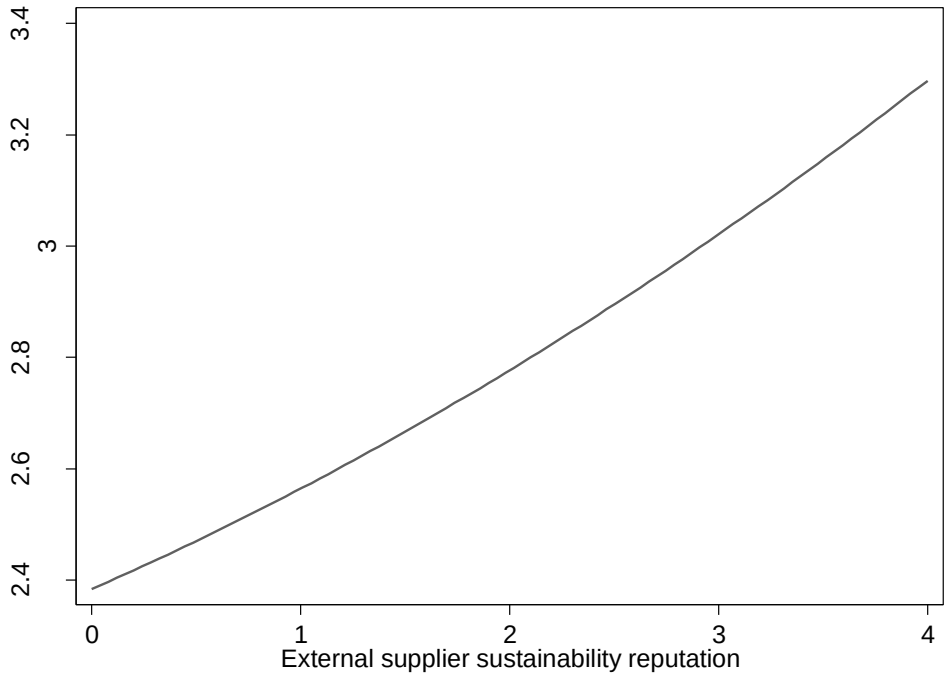


Figure 6: Effect of the supplier's external sustainability reputation on the supplier's evaluation

Hypotheses 6 and 7 require testing for mediation. Considering recent guidelines by Malhotra et al. (2014), Preacher and Hayes (2008), and Zhao et al. (2010), we decided to conduct the bootstrapping approach (with n=1,000 bootstrap resamples). The supplier's evaluation mediates the effect of the supplier's internal sustainability reputation on order volume with a high significance (z=10.77; $p \leq 0.001$), thus confirming hypothesis 6. Due to the insignificant direct effect of the supplier's internal sustainability reputation on order volume, we ascertain full or indirect-only mediation (Baron and Kenny, 1986). In support of hypothesis 7, we show

that the supplier's evaluation mediates the effect of the supplier's external sustainability reputation on order volume with a high significance ($z=10.03$; $p \leq 0.001$). Since the direct effect of the supplier's external sustainability reputation on order volume ($\beta=0.36$; $p \leq 0.01$) is still significant, the mediation is partial or complementary in this case (Baron and Kenny, 1986).

4.2. Model robustness

We evaluated all possible time lags (one to four years) and the possibility of no time lag for the independent variables in the models OV1 and OV2. Our chosen time lag of one year is corresponding to the idea that a certain but not very high delayed impact of the supplier's sustainability reputation and evaluation on order volume is most plausible (Richard et al., 2009; Chatfield, 2016).

Furthermore, our study requires addressing the dilemma of endogeneity, which can never be entirely eliminated from empirical analyses (Roberts and Whited, 2013, p. 498; Ketokivi and McIntosh, 2017). Endogeneity questions the sources of the variance of exogenous variables. Its presence may bias measured effect sizes substantially, thereby obstructing their interpretation (Semadeni et al., 2014; Guide and Ketokivi, 2015). Like other recently published papers in operations management, which also rely on secondary data, we carefully addressed endogeneity from the view of theory, methodology and statistics (e.g., Dobrzykowski et al., 2016; Bendig et al., 2017; Massimino et al., 2017; Wiengarten et al., 2017).

Reverse causality between the independent and the dependent variables represents a possible alternative source of variance for our exogenous variables. For the significant relationships found, it was addressed theoretically by applying literature and logic supporting the statement that the supplier's sustainability reputation influences the supplier's evaluation and the supplier's performance, and that the supplier's evaluation itself also affects the supplier's performance (e.g., Boyd et al., 2010; Letizia and Hendrikse, 2016). It was also addressed methodologically since we used longitudinal data with a one-year time lag between the supplier's evaluation and sustainability reputation, and the dependent variable order volume for our analysis (Roberts and Whited, 2013; Lam et al., 2016). This means that we scrutinized the effect of the supplier's evaluation and sustainability reputation in the year (t-1) on the buying firm's order volume in the year (t), indicating that reverse causality is highly improbable in this model. Statistically, we used a three-stage longitudinal regression model to test our hypotheses, since the three-stage method can correct for endogeneity (Hamilton and Nickerson,

2003). Therefore, we are confident to have alleviated endogeneity concerns surrounding reverse causality through the measures described above.

There might still be other unobserved variables, which affect both the independent and the dependent variables of our two models. However, even if such variables were influential, still no reason would be apparent as to why they should invalidate our results.

5. Concluding discussion

This study draws on the resource-based view to analyze whether a supplier's reputation for sustainable business conduct can lead to increased performance, manifested in the form of order volume from the buying firm. To answer our research question, we utilized data from 4,107 suppliers from a technology firm for the five years from 2011 to 2015. Table 17 shows an overview of our hypotheses conclusions.

Table 17: Hypotheses conclusions

Hypothesis	Conclusion
H1: Internal supplier sustainability reputation → Firm performance (+)	**Rejected**
H1a: (Internal supplier sustainability reputation)^2 → Firm performance (~/+)	Rejected
H1b: (Internal supplier sustainability reputation)^2 → Firm performance (-)	Rejected
H2: External supplier sustainability reputation →Firm performance (+)	**Accepted**
H2a: (External supplier sustainability reputation)^2 → Firm performance (~/+)	Accepted
H2b: (External supplier sustainability reputation)^2 → Firm performance (-)	Rejected
H3: Supplier evaluation → Firm performance (+)	**Accepted**
H4: Internal supplier sustainability reputation → Supplier evaluation (+)	**Accepted**
H4a: (Internal supplier sustainability reputation)^2 → Supplier evaluation (~/+)	Accepted
H4b: (Internal supplier sustainability reputation)^2 → Supplier evaluation (-)	Rejected
H5: External supplier sustainability reputation → Supplier evaluation (+)	**Accepted**
H5a: (External supplier sustainability reputation)^2 → Supplier evaluation (~/+)	Accepted
H5b: (External supplier sustainability reputation)^2 → Supplier evaluation (-)	Rejected
H6: Internal supplier sustainability reputation → Supplier evaluation → Firm performance	**Accepted**
H7: External supplier sustainability reputation → Supplier evaluation → Firm performance	**Accepted**

5.1. Scholarly contributions

This is the first empirical study, which analyzes whether a reputation for sustainable business conduct can contribute to competitive advantage within established buyer-supplier relationships. We showed longitudinally over a five-year period that the supplier's reputation with regard to fulfilling firm-external sustainability standards (i.e., being known for conforming to sustainability standards with regard to the law and stakeholder requirements), and the supplier's evaluation in view of cost, quality, delivery reliability, and technology have a time-lagged effect on the supplier's performance. Moreover, both the supplier's internal (i.e., being

regarded as conforming to the buying firm's sustainability expectations) and external reputation for sustainable business conduct positively affect the supplier's evaluation itself.

These results can also be explained through the lens of instrumental stakeholder theory, which claims that sticking to external stakeholder requirements leads to a performance equal to or above competitors (Donaldson and Preston, 1995, p. 71). Therefore, it should be the "enlightened self-interest" of the buying firm to adhere to legal regulations and stakeholder requirements concerning sustainability (Clarkson, 1995; Deegan and Shelly, 2014). In this vein, our study emphasizes that not only possible new suppliers entering the selection process are confronted with sustainability standards as gate-keepers (Reuter et al., 2010), but that also established suppliers have to maintain a sustainable reputation to be considered for further cooperation with high order volumes from their buying firms.

Furthermore, our research augments the resource-based view, by means of distinguishing between the supplier's internal and external sustainability reputation. Because of their effects on the suppliers evaluation and/or performance, both forms of reputation can be regarded as valuable, rare, imperfectly imitable and non-substitutable resources (VRIN resources) leading to a competitive advantage in the form of a higher order volume of the buying firm from the supplier. Nevertheless, it has to be noted that no direct effect of the supplier's internal sustainability reputation on the supplier's performance was found. The effect of the supplier's internal sustainability reputation canalizes itself on the supplier's performance through the supplier's evaluation results. The supplier's external sustainability reputation, however, affects the supplier's performance directly and through its evaluation results.

Finally, by comparing two competing views, namely the above mentioned reputation-as-VRIN-resource view and the warding-off reputation-risks view, we also address Aguinis and Edward's (2014) first wish for the next decade. In doing so, we analyze the magnitude of the effect of the supplier's sustainability reputation through linear and curvilinear predictors. We find support for a positive curvilinear effect of the supplier's external sustainability reputation on both the supplier's evaluation and the supplier's performance in the form of order volume from the buying firm, and a linear effect of the supplier's internal sustainability reputation on the supplier's evaluation.

5.2. Practical contributions

Suppliers often feel that they have little power in buyer-supplier relationships (Autry and Golicic, 2010). Nevertheless, this research indicates that they can influence the order volume

from their buying firm, and thus their future performance, by investing in a reputation for sustainable business conduct. Our research shows that two forms of sustainability reputation complement each other, implying that both an internal (i.e., relationship-specific) and an external (i.e., relationship-unspecific) form of sustainability reputation can augment each other in ultimately achieving competitive advantage in the form of increased order volume.

Moreover, this study did not find any overinvestment effects concerning sustainability reputation. Therefore, suppliers should bear in mind that a better sustainability reputation leads to an increased order volume from their buying firm, irrespective of their current sustainability reputation level.

Nevertheless, it is notable that the internal sustainability reputation does not directly manifest in a significantly higher order volume from the buying firm, but indirectly through the evaluation results. Having that said, it is even in general favorable for suppliers to not neglect the traditional evaluation criteria quality, delivery reliability, and cost, which also represent important sources for their competitive advantage.

5.3. Limitations and future research

Naturally, this study exhibits some limitations. First, we use data from a single technology firm. Therefore, the results might be different for other buying firms, especially from different industries. For instance, a sustainable supplier reputation might be even more critical for buying firms in the food industry (Pullman et al., 2009). But also larger buying firms are more in the spotlight and might, therefore, put even higher attention on their supplier's sustainability reputation. Second, we do not know the evaluation criteria of the suppliers' other buying firms, that means whether the total sales of the supplier with regard to all buying firms has grown due to its efforts to reach a high sustainability reputation and a high evaluation result. Third, our model cannot preclude that the supplier has invested too much in a sustainable reputation, meaning that he would have received the same order volume from the buying firm even if its sustainability reputation would have been lower. This is the case since additional factors might influence the order volume of a buying firm from one specific supplier. Amongst these is, for instance, the power of the buying firm over the supplier, which is dependent upon the criticality of the product or service and the availability of other suppliers (Touboulic et al., 2014). Fourth, firms are not safe from structural disturbances that are independent of their own attributes. For example, the Internet boom-and-bust from 1997 to 2001 or the global financial crisis from 2007 to 2008 represent such disturbances (Bond et al., 2000; Erkens et al., 2012). However, for the

five years from 2011 to 2015, which are the basis for our study, the influence of such structural disturbances is marginal.

Future research could seize the opportunity to investigate the non-significant relationship further by exploring whether there are certain conditions under which it holds. Moreover, a sensitivity analysis should be carried out for the different supplier evaluation criteria (Orlitzky et al., 2003). In doing so, researchers could also identify and more clearly define each of these criteria by better reflecting the requirements of stakeholders (Ho et al., 2010). Furthermore, we could not use additional financial or market data for our analysis because many suppliers are privately owned, and the multi-country design with suppliers coming from 45 developed and developing countries would make some financial comparisons problematic (Kotabe et al., 2003). Nevertheless, in a suitable context, such an analysis would be worthwhile. Finally, research in supply chain management has shown that firms can enrich their resource portfolios by building relationships with and having access to the resources of their suppliers (Lavie, 2006; Paulraj, 2011). Our study already indicates that a supplier's reputation for sustainable business conduct represents an essential resource for a buying firm. Nevertheless, in the context of warding-off reputation risks along the supply chain, further research should beyond that empirically study whether a spillover of a positive supplier sustainability reputation leads to better outcomes for the buying firm (Hitt et al., 2016b).

In all, we are confident that this study can show suppliers the beneficial effects of a reputation for sustainable business conduct. In this way, our study has contributed to a better understanding of a reputation for sustainable business conduct in the context of competitive advantage.

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CHAPTER 4 – THE BOUNDARY CONDITIONS OF LEGITIMACY SPILLOVERS: ASSESSING THE IMPACT OF THE INTER-ORGANIZATIONAL BUYER-SUPPLIER RELATIONSHIP

Abstract

Research on legitimacy spillovers between two organizations is salient. Yet, it has until now not analyzed the mechanism of responsibility attribution and punishment of a third party as a potential cause for them. Drawing on a scenario-based experiment with 400 participants from the US and India, we develop the boundary conditions of legitimacy spillovers in the eyes of consumers premised on the inter-organizational relationship characteristics between the supplier (legitimacy source) and the buying firm (legitimacy destination). In doing so, we focus on the buying firms' controllability of a socially unsustainable incident at the supplier. We find that the buying firm's power over the supplier and its foresight over the supplier's actions significantly influence legitimacy spillovers. Moreover, legitimacy spillovers are dependent upon cultural aspects and upon the consumer's mode, meaning whether the consumer is in a passive mode (relies on his/her feelings and is not cognitively activated) or in an evaluative mode (invests mental effort and is cognitively activated).

Keywords: legitimacy spillover, boundary condition, buyer-supplier relationship, attribution theory, scenario-based experiment

1. Introduction

It is a key question whether firms should be held responsible for actions outside their legal boundaries (Campbell, 2007; Busse et al., 2017). This is especially the case for misconduct with regard to corporate social responsibility, which has the potential to challenge legitimacy through negative spillovers from outside of the firm boundaries (Wang et al., 2016; Soundararajan and Brammer, 2018). Although the research stream can theoretically well capture legitimacy spillovers (e.g., Haack et al., 2014; Bitektine and Haack, 2015; Suddaby et al., 2017), it has not yet studied the mechanism of responsibility attribution and punishment of a third party as a potential cause for them (Fincham and Jaspers, 1980). More specifically, for this causal mechanism, the determinants of the inter-organizational relationship between legitimacy source and legitimacy destination are still unexplored.

The mechanism of responsibility attribution and punishment is also essential in a supply chain context on which empirical basis we develop the boundary conditions of legitimacy spillovers. In doing so, we focus on the relationship between the supplier (legitimacy source) and the buying firm (legitimacy destination). Many practical examples show that firms buying globally are under pressure to discharge themselves of unsustainable behavior along their supply chain (Amaeshi et al., 2008; Kim and Davis, 2016). For instance, the electric car company Tesla, which was accused since it relied on cheap foreign labor through its German-based supplier Eisenmann, underlines the practical relevance of negative legitimacy spillovers across supply chains (The Guardian, 2016). In this case, Tesla CEO Elon Musk apologized since Eisenmann paid a wage of $5 an hour for 140 workers in a hi-tech paint shop in California, which is only a tenth of the prevailing wage for local metal workers (The Guardian, 2016).

In this vein, the “chain liability” concept describes that customers as third parties hold buying firms responsible and punish them for the unsustainable conduct of their suppliers, which can lead to financial losses and a higher financial risk for the buying firm (Wagner et al., 2012; Kölbel et al., 2017). Therefore, researchers and managers should be capable of determining the expectations of consumers concerning sustainable firm conduct along the supply chain by identifying the determinants, which lead to responsibility attribution and punishment (Harrison et al., 2010). In particular, it is highly relevant for buying firms to know when they have to anticipate a high responsibility attribution and punishment due to supplier misconduct with regard to corporate social responsibility and, thereby, also a considerable extent of negative legitimacy spillovers. Therefore, the following research question arises: *How*

do the characteristics of the inter-organizational relationship between the buying firm and the supplier affect the extent of negative legitimacy spillovers due to supplier misconduct?

We employ an experimental design with student samples from the United Kingdom, and consumers from the US and India which we recruit through the crowdsourcing platform Amazon Mechanical Turk (AMT). In doing so, we specify the sustainability-related misconduct from the direct (Tier-1) supplier of a buying firm as worker exploitation through low wages. Through eight scenarios, we examine the effect of the characteristics of the inter-organizational buyer-supplier relationship on negative legitimacy spillovers related to the buying firm.

The remainder of this paper is structured into five major sections: in the next section, we describe the theoretical background of this study, namely legitimacy spillovers and attribution theory. Moreover, we develop our hypotheses in this section. The third section explains the methodology, consisting of the experimental design, the study participants, the measures, and the manipulation and realism checks used in this paper. In the fourth section, we present the results of this study which include a regression analysis concerning the consumers' responsibility attribution and punishment, and a qualitative analysis for the reasoning behind the consumers' decision. Finally, the fifth section concludes with the contributions of this paper, its limitations, and possibilities for future research.

2. Theoretical background

2.1 Legitimacy spillovers

Traditionally, legitimacy can be defined as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995, p. 574). Within this definition, legitimacy is considered to be a collective (objective) perception that consists of individual (subjective) assessments (Suddaby et al., 2017). Illegitimacy, which is the focus in this study, is the opposite of legitimacy and has the potential to threaten the success of an organization, and ultimately organizational survival (Elsbach and Sutton, 1992; Hudson, 2008).

Dependent on the legitimacy assessor, recent research has developed a more subtle definition of legitimacy and distinguishes between the four concepts of "legitimacy as a property", "legitimacy as a process", "legitimacy as a feeling", and "legitimacy as a perception" (Haack et al., 2014; Suddaby et al., 2017). The concept "legitimacy as a property" considers

legitimacy to arise independently from the individual legitimacy assessor when there is a fit between the characteristics of the organization and its external environment. Relying on this concept, prior studies show amongst others that legitimacy spillovers are particularly strong when an organization enters into a new host country (Kostova and Zaheer, 1999). When there are multiple organizations considered to be important with regard to the interactive and changing occurrence of legitimacy, the "legitimacy as a process" concept is predominant. In this vein, for instance, Kuilman and Li (2009) find that organizations being part of a subpopulation with a low degree of fit with the rest of the population benefit more from legitimacy spillovers than organizations with a high degree of fit.

The remaining two concepts draw primarily on the view of the individual legitimacy assessor. In the case that the individual legitimacy assessor relies on an affect heuristic, namely his or her positive or negative feelings, to evaluate legitimacy, the concept of "legitimacy as a feeling" is prevalent. For instance, Haack et al. (2014) theorize how the general public as legitimacy assessor uses affect heuristics towards better-known affiliates of transnational governance schemes (TGSs) (e.g., NGOs) to evaluate the legitimacy of the TGSs (e.g., United Nations Global Compact) themselves. In contrast, the concept of "legitimacy as a perception" sees legitimacy arising when individual legitimacy assessors perceive organizations as legitimate by being cognitively activated through collective-level judgments. About this concept, for instance, Tost (2011) argues that individual legitimacy assessors' judgments are based on the instrumental, relational and moral dimension. Further details about the four different legitimacy concepts can be found in the interpretative review of Suddaby et al. (2017).

Building on the concepts of "legitimacy as a feeling" and "legitimacy as a perception," researchers differentiate between two modes with regard to legitimacy assessors. In the *passive mode*, the legitimacy assessor, which is, in this case, an "intuiter" relies on validity cues (e.g., from the media) for responsibility attribution and punishment to decrease mental effort (Tost, 2011; Bitektine and Haack, 2015). In the *evaluative mode*, the legitimacy assessor, which is, in this case, an "evaluator" is cognitively activated (e.g., through the media) and invests mental effort for responsibility attribution and punishment (Tost, 2011; Bitektine and Haack, 2015). With individuals (consumers) as legitimacy assessors, we rely on the "legitimacy as a feeling" concept when the consumer is in the passive mode and the "legitimacy as a perception" concept when the consumer is in the evaluative mode (Dane and Pratt, 2007; Suddaby et al., 2017).

This study focuses specifically on legitimacy spillovers. Legitimacy spillovers are always transferred from a legitimacy source to a legitimacy destination (Kostova and Zaheer,

1999), whereby we understand the legitimacy source as the organization which transfers the legitimacy through a spillover and the legitimacy destination as the organization which receives the legitimacy from the spillover. Researchers distinguish between internal legitimacy spillovers which occur within the organization and external legitimacy spillovers which occur from beyond the firm's boundaries (Kostova and Zaheer, 1999; Deasai, 2011; Surroca et al., 2013). The focus of this study is the latter mentioned external legitimacy spillovers. External legitimacy spillovers can horizontally disseminate through product families or industries (e.g., Röhm and Tybout, 2006; Barnett and King, 2008; Yu et al., 2008; Zavyalova et al., 2012) and vertically through inter-organizational relationships like buyer-supplier relationships (Dobrev et al., 2006; Hartmann and Möller, 2014), whereby we again concentrate on the latter one. Moreover, external legitimacy spillovers can occur in two different directions (Kostova and Zaheer, 1999): as positive spillovers which enhance legitimacy and as negative spillovers which impair legitimacy. These two types of legitimacy spillovers are not symmetric with regard to their effects since negative legitimacy spillovers, which are the focus in this study, are expected to have a stronger effect than positive legitimacy spillovers (Kostova and Zaheer, 1999).

As described above, negative legitimacy spillovers to related organizations can occur when consumers assess an occurrence as undesirable (e.g., Pätzold et al., 2008; Jonsson et al., 2009; Desai, 2011; Kim et al., 2011; Lamin and Zaheer, 2012). Thus, the extent of a negative legitimacy spillover can be measured by the consumers' responsibility attribution and punishment (Haack et al., 2014).

2.2 Responsibility attribution and punishment

Attribution theory considers individuals as reasonable information processors who want to explain the world by attributing causes to occurrences (Hamilton, 1976; Harvey and Rule, 1978; Kelley and Michela, 1980). Confronted with an adverse occurrence, an individual wants to find out what caused it (perceived causality) and seeks to understand who is responsible for it (attributed responsibility) (Hart, 1959). Responsibility attribution does not imply that the accused caused the harm (Fincham and Jaspers, 1980). The accused can be held responsible for every adverse occurrence that is in any manner connected with them (Heider, 1958, p. 113). Therefore, responsibility can also be attributed across relationships from a legitimacy source to a legitimacy destination (Fincham and Jaspers, 1980).

We extend attribution theory to the relationship between an individual (consumer) and two organizations (supplier and buying firm), as opposed to the relationship between an

individual and only one other individual or organization (Hartmann and Möller, 2014). In the theoretical literature, responsibility attribution is not appropriately differentiated from punishment (Fincham and Jaspers, 1980). Yet, in this case, we separately identify the responsibility attribution and the punishment of the buying firm in the eyes of the consumer.

Building on Weiner (1992, p. 248), researchers distinguish between three dimensions with regard to responsibility attribution and punishment: *locus of causality* (degree of externalization of the cause), *controllability* (degree of intentional control of the accused over the cause), and *stability* (degree to which the cause stays constant over time). The most frequently analyzed attributional dimension is the *locus of causality* (Harvey et al., 2014). However, due to our focus on buyer-supplier relationships with an unsustainable occurrence at the supplier site, we concentrate on the *controllability* dimension.

Occurrences that are not controllable for organizations can be the actions of more powerful other organizations (Thompson, 1967; Knight and McDaniel, 1979; Ford, 1985). Hence, in the case of an adverse occurrence that is caused by a related organization, a third parties' responsibility attribution and punishment can be based on reflections about the focal organizations' power over the related organization (Shaver, 1985; Eberly et al., 2011; Lange and Washburn, 2012). In this case, power is dependent upon the relationship, and it is not a characteristic of the organization (Emerson, 1962). Moreover, controllability is based on the belief that accused organizations have enough foresight to prevent negative incidents (Heider, 1958; Fincham and Jaspers, 1980; Shaver, 1985). Thus, in case of a negative occurrence that is caused by a related organization, a third parties' responsibility attribution and punishment can take into account the focal organizations' foresight about the related organizations activities since without foresight, even a powerful organization cannot control a negative incident that is caused by a related organization (Lange and Washburn, 2012). Against this background, less powerful organizations and organizations with less foresight should be included in studies to find out to which extent organizations with more control possibilities are held to have a responsibility towards those with less (Oliver, 1990; Carroll and Buchholtz, 2012, p. 6; Sodhi, 2015).

2.3 Hypotheses development

In this study, legitimacy captures the degree to which consumers consider an organization to conform to social norms and standards (Suchman, 1995; Bitektine, 2011; Tost, 2011). To capture the legitimacy of the buying firm in the eyes of the consumer after an unsustainable

supplier incident, we focus on the attribution theory dimensions *controllability* and operationalize it through two constructs which both have the potential to lead to legitimacy spillovers due to corporate social irresponsibility attribution (Lange and Washburn, 2012). First, the *power* of the buying firm over the supplier, and second, the *foresight* of the buying firm over the supplier's activities. Furthermore, we analyze the consumer in a *passive mode* (the consumer relies on his/her feelings and is not cognitively activated) and in an *evaluative mode* (the consumer invests mental effort and is cognitively activated) (Tost, 2011). Finally, we also distinguish between consumers with different cultural backgrounds by including participants from the US and India into the experiment. Table 18 shows the connection between the theoretical dimensions, constructs, and hypotheses used in this study.

Table 18: Links between theoretical dimensions, constructs, and hypotheses

Theoretical dimension	Construct	Hypothesis
Attribution theory: Controllability	*High power* of the buying firm over the supplier *Vs.* *Low power* of the buying firm over the supplier	**H1**
	High foresight of the buying firm on the supplier's activities *Vs.* *Low foresight* of the buying firm on the supplier's activities	**H2**
Dual processing theory: Consumer mode	*Passive mode:* the consumer relies on his/her feelings and is not cognitive activated *Vs.* *Evaluative mode*: the consumer invests mental effort and is cognitively activated	**H3a-H3b**
Cross-cultural analysis: Consumer country	Consumers from the *US* *Vs.* Consumers from *India*	**H4**

A buying firm has high controllability and is, consequently, complicit in an unsustainable occurrence of a supplier, when it has a high power over the unsustainable supplier (Lange and Washburn, 2012). This is the case since it is assumed that the buying firm could have acted to prevent the unsustainable incident. A powerful buying firm should screen its less powerful supplier closely when it represents a large proportion of the total sales of this supplier, meaning

that the buying firm is of high commercial importance for the supplier (Provan and Gassenheimer, 1994). Vice versa, the supplier has a high dependence on the buying firm if the buying firm has high power. Therefore, in the case of an unsustainable supplier incident, the extent of the consumers' responsibility attribution and punishment towards the buying firm is higher for a powerful buying firm (Lange and Washburn, 2012; Touboulic et al., 2014). With that said, we hypothesize:

> *Hypothesis 1: The higher the buying firm's power over the supplier, the higher the extent of the negative legitimacy spillover from the unsustainable supplier to the buying firm.*

Also, a buying firm possesses high controllability and, therefore, complicity in an unsustainable occurrence if it has a high foresight concerning the supplier's activities (Lange and Washburn, 2012). Again, it is assumed that the buying firm could have intervened to avert the unsustainable supplier occurrence. A high foresight is accumulated by the buying firm when a high social capital between the buying firm and the supplier exists, which can, for instance, be achieved through supplier audits or incidents happened in the past (Lawson et al., 2008; Paulraj et al., 2008). If the buying firm identified problematic issues in its supplier audits or the past, it has few information deficits since the supplier is behaviorally visible to the buying firm (Wijen, 2014). Therefore, the buying firm knows with a higher probability of the unsustainable conditions at the supplier's site. This high foresight is also prevalent when the supplier has a poor reputation. Hence, if the buying firm has a high foresight on the activities of the unsustainable supplier, the extent of the consumers' responsibility attribution and punishment towards the buying firm is higher in the case of an unsustainable supplier incident (Grover and Saeed, 2007; Lange and Washburn, 2012). Accordingly, we hypothesize:

> *Hypothesis 2: The higher the buying firm's foresight with regard to the supplier's activities, the higher the extent of the negative legitimacy spillover from the unsustainable supplier to the buying firm.*

The passive and evaluative mode is part of the concept of dual-process theories, which describes individuals in either an affective, feeling-related (in our case passive) or cognitive, fact-related (in our case evaluative) mode (Trafimow and Sheeran, 1998; Greifeneder et al., 2011; Gawronski and Creighton, 2013). When consumers are led by their feelings, they often do not recognize that buying firms can have insufficient control to affect the sustainability of their complex supply base (Bode and Wagner, 2015). In contrast, when consumers confide in their cognition, they rely more on hard facts presented and can – if relevant – identify the buying

firm's limited control over its supplier. Consequently, we assume that the mode of the consumer moderates the extent of the consumers' responsibility attribution and punishment of the buying firm, and suggest the following two moderating hypotheses (van den Berg et al., 2006; van Gelder et al., 2008; Tost, 2011):

> *Hypothesis 3a: When the consumer is in the passive mode, the extent of the power-related, negative legitimacy spillovers from the unsustainable supplier to the buying firm is higher and less differentiated than when the consumer is in the evaluative mode.*
>
> *Hypothesis 3b: When the consumer is in the passive mode, the extent of the foresight-related, negative legitimacy spillover from the unsustainable supplier to the buying firm is higher and less differentiated than when the consumer is in the evaluative mode.*

In the legitimacy assessment process, country differences in the perception of legitimacy have to be considered (Maignan, 2001; Christie et al., 2003). This is the case since cultural variations in stakeholders' expectations can occur (Surroca et al., 2013). There are many different dimensions available to assess cultural differences between countries (e.g., Lodge, 1990; Hofstede 1980, 1985; House et al., 2004; Hall, 1976, Schwartz, 1992). Because of our focus on consumers as unit of analysis, we choose the dimensions of Hofstede (1980, 1985), which describe the characteristics of national cultures according to the values held by individuals. Hofstede (1980, 1985) distinguishes between six cultural dimensions, namely power distance, individualism, masculinity, uncertainty avoidance, long-term orientation, and indulgence. With our analysis of individuals' responsibility attribution and punishment towards the buying firm in the case of an unsustainable supplier occurrence, we rely on Hofstede's (1980, 1985) dimensions power distance, which means the extent to which less powerful individuals expect and accept that power is distributed unequally, and individualism, which captures the degree of interdependence among individuals. Due to the high manifestation of the dimension power distance and the low manifestation of the dimension individualism in India, and the opposite manifestation of these dimensions in the US, consumers from India are more likely to be affected by unsustainable occurrences. The high manifestation of power distance in their culture exposes consumers from India more to inequality among people. Therefore, they are more sensitive towards social sustainability. Moreover, as the individualism in their culture is low, Indian consumers are concerned about socially unsustainable incidents even if they are not personally affected. Thus, we assume that the extent of the consumers' responsibility attribution and punishment of the buying firm in the case of an unsustainable supplier incident is higher

for consumers from India than for consumers from the US. Accordingly, we propose the following hypothesis:

> *Hypothesis 4: Cultural differences influence the effect of negative legitimacy spillovers from the unsustainable supplier to the buying firm in such way that they are stronger for consumers from India than for consumers from the US.*

3. Methodology

3.1 Experimental design

Data collection methods like experiments are needed in management research since they provide maximal confidence that an independent variable is causing a dependent variable (internal validity) (Colquitt, 2008). We use an experimental vignette methodology (EVM), which is also known as a scenario-based experiment (Field and Hole, 2003; Rungtusanatham et al., 2011; Aguinis and Bradley, 2014). EVM is mainly suitable when "it is difficult to experimentally manipulate sensitive topics in an ethical manner" as it is the case when assessing the sustainability of parties along the supply chain (Aguinis and Bradley, 2014, p. 357). Since consumers' real-world responsibility attributions and punishments are often affected by reading a newspaper article about an organization or an adverse occurrence, letting the participants read a vignette is a natural way for them to state their responsibility attribution and punishment decision (Lange and Washburn, 2012). Consequently, EVM is very suitable for the context of our study as it leads to a high degree of realism for the participants. Figure 7 shows how the theoretical model is addressed in an empirical context.

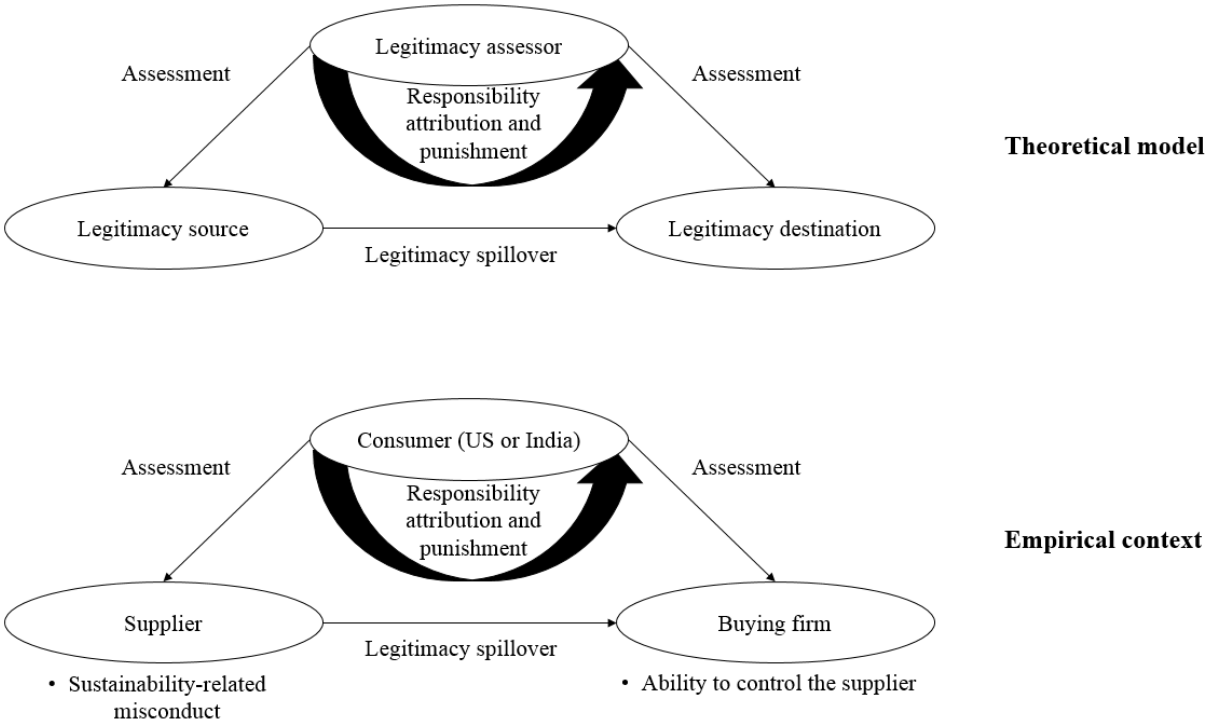

Figure 7: Addressing the theoretical model in an empirical context

The vignette in this study describes a buying firm cooperating with a supplier when sustainability-related misconduct caused by the supplier becomes apparent. We use a fixed industry, namely the food industry for the vignette since a significant control surplus for either the buying firm or the supplier is possible in this industry. We also focus on a fixed unsustainable social occurrence, namely the exploitation of workers at the supplier site through paying wages below the national minimum wage. Depending on the participants' country of origin, we fix the buying firm's and supplier's location to either the US or India, such that the participants can state their responsibility attribution and punishment towards the buying firm for their own legitimacy context. After the general introduction in the vignette, we manipulate three constructs: the consumers' mode, the buying firms' power, and the buying firms' foresight (Lange and Washburn, 2012; Tost, 2011). The three manipulations are combined in a vignette with a 2^3 between-subjects design, resulting in eight scenarios, whereby every participant is exposed to a different scenario with all three manipulations (Aguinis and Bradley, 2014). Table 19 shows the vignette design.

Table 19: Vignette with a 2^3 between subjects design

General intro-duction (H4)	Grocery Co. is a regional grocery store chain which operates 250 stores and purchases premium ready-made meals from Ready-Meal Co., a medium-sized food processing company. Both Grocery Co. and Ready-Meal Co. are located in the US/India, and have worked together for many years. Grocery Co. has a formal social responsibility policy, which is communicated to all suppliers and is a condition of doing business with the company. The policy covers a wide manner of conditions relating to labor standards, including payment of the national minimum wage. Where violations of this policy are identified, Grocery Co. engages with suppliers to resolve the problem. After performing an undercover investigation, a national newspaper ran a front-page article today revealing that Ready-Meal Co. has been systematically paying its 300 production line workers at a rate significantly below the national minimum wage. The article highlights the role of Grocery Co. as a long-standing customer of Ready-Meal Co. This unsustainable incident has received considerable attention in the broader press and social media. In responding to the claims, Grocery Co. has publicly stated it will investigate the unsustainable incident, and expects to continue its relationship with Ready-Meal Co.	
Consumer mode (H3a-H3b)	**aa. Passive** The article notes that, in general, companies have become increasingly concerned about paying at least the national minimum wage to their production line workers in recent years. The reason for this is not so much a response to government regulation, but rather companies' fears of not meeting consumer expectations with regard to social responsibility.	**ab. Evaluative** The article notes that, in general, an increasing number of companies are paying at least the national minimum wage to their production line workers in recent years. The reason for this is not so much a response to government regulation, but rather the chance of not meeting consumer expectations with regard to social responsibility.
Power (H1)	**ba. Low** Grocery Co. is a customer with a low level of power over Ready-Meal Co. Grocery Co. represents a small proportion of Ready-Meal Co.'s total sales, and Ready-Meal Co. has a low dependence on Grocery Co. for its profitability.	**bb. High** Grocery Co. is a customer with a high level of power over Ready-Meal Co. Grocery Co. represents a large proportion of Ready-Meal Co.'s total sales, and Ready-Meal Co. has a high dependence on Grocery Co. for its profitability.

Foresight (H2)	**ca. Low** Grocery Co. has a low level of foresight of the potential for unsustainable incidents of Ready-Meal Co. Ready-Meal Co. has a good reputation within the food processing industry with respect to its labor standards. Audits of Ready-Meal Co.'s factory had not identified any issues that would require Grocery Co.'s attention, and Ready-Meal Co. has no history of previous unsustainable incidents.	**cb. High** Grocery Co. has a high level of foresight of the potential for unsustainable incidents at Ready-Meal Co. Ready-Meal Co. has a poor reputation within the food processing industry with respect to its labor standards. Audits of Ready-Meal Co.'s factory had identified issues that would require Grocery Co.'s attention, and Ready-Meal Co. has a history of previous unsustainable incidents.

To reinforce the manipulation of the consumer mode, we utilize two forms of affective and cognitive priming (Murphy and Zajonc, 1993). First, before reading their scenario, the participants complete a word-search puzzle, where they search for hidden words in a 15 by 15 letter matrix (van den Berg et al., 2006; van Gelder et al., 2008). Words are hidden from top to bottom, from bottom to top, from left to right, from right to left or diagonally. The participants are asked to mark the words they find. The seven words which have to be found are listed next to the word-search puzzle. In the passive mode, the participants search for 'feeling', 'emotion', 'sensation', 'state of mind', 'intuition', 'impression' and 'experiencing'. Conversely, in the evaluative mode, the participants search for 'thinking', 'logic', 'analyzing', 'rational', 'knowing', 'mind' and 'reasoning'. Second, after reading their scenario, the participants are shown an either feeling-related or cognition-related picture. The pictures are derived from the Open Affective Standardized Image Set (OASIS), which has been verified by AMT (Kurdi et al., 2017). For developing the OASIS, 822 AMT participants rated 900 color images concerning their valence (i.e., the degree of their positive or negative affective response) and arousal (i.e., the intensity of the aforementioned affective response), each on a scale from one to seven. For the passive mode, we choose a picture of a fire with a low valence (mean=1.484, standard deviaion=0.816) and high arousal (mean=5.08, standard deviation=1.978). In contrast, for the evaluative mode, we select a picture of a wall with a medium valence (mean=4.000, standard devistion=0.535) and low arousal (mean=1.581, standard deviation=0.982).

To enhance the validity of the vignette, we sent it for feedback to researchers with extensive expertise in experimental studies. Furthermore, we pretested an earlier version of the vignette with 48 undergraduate and graduate students studying in the United Kingdom. In the

pretest, the students also answered manipulation checks and assessed the realism of their scenario. The results of the pretest led to a significant enhancement of the vignette before starting data collection in the main study.

After reading their scenario, the participants state their quantified responsibility attribution and punishment. We use an indirect questioning technique for the punishment decision since the area of social responsibility tempts participants to distort their answers to appear socially desirable (Fisher, 1993). Moreover, the participants provide reasons for their responsibility attribution and punishment decisions (voluntary post hoc qualitative inquiry), answer cross-cultural questions to make sure that their values correspond to their country of origin (Hofstede et al., 2013; Hofstede and Minkov, 2013), and answer several control variable items.

3.2 Study participants

The data is collected via the crowdsourcing platform AMT. Several studies show that AMT enables researchers to collect very reliable data that despite slightly higher participant rejection rates is indistinguishable from laboratory data with regard to data quality (Buhrmester et al., 2011; Sprouse, 2011). We implement attention checks, IP-address tracking, response time tracking, and self-report indices to ensure high data quality (Meade and Craig, 2012; Abbey and Meloy, 2017; Bowling et al., 2016; Curran, 2016; DeSimone et al., 2015). Compared to standard Internet samples, AMT participants are marginally more demographically diverse and, compared to US student samples they are significantly more demographically diverse (Buhrmester et al., 2011). AMT has recently been used for scenario-based experiments published in the *Academy of Management Journal* (e.g., Burris et al., 2017; Desai and Kouchaki, 2017). It provides access to US and Indian samples. We include participants from both countries to observe whether there are cross-cultural differences in responsibility attribution and punishment prevalent (Adler, 1983). Overall, we collect data from 572 participants (321 US participants and 251 Indian participants). We receive 544 fully completed surveys (302 US surveys and 242 Indian surveys). After excluding participants due to failed attention checks and identical responses with the same IP address, we are left with a sample of 400 participants (285 US participants and 115 Indian participants). Table 20 describes the utilized consumer sample.

Table 20: Description of consumer sample (n=400)

Demographic	Percent of sample
Nationality	
American (=0)	71.25
Indian (=1)	28.75
Months spent abroad	
0-2 months	67.00
3-11 months	13.00
12-35 months	11.50
36-59 months	4.00
60-119 months	2.75
120 months and more	1.75
Household income	
Less than $3,500 (less than 23,000 INR)	6.50
$3,500-$7,499 (23,000 INR - 477,999 INR)	11.00
$7,500-$14,999 (478,000 INR - 954,999 INR)	7.50
$15,000-$24,999 (955,000 INR - 1,589,899 INR)	12.50
$25,000 - $49,999 (1,589,900 INR - 3,180,199 INR)	23.75
$50,000 - $74,999 (3,180,200 INR - 4,770,299 INR)	19.75
$75,000 - $99,999 (4,770,300 INR - 6,361,599 INR)	10.50
$100,000 or more (6,361,600 INR or more)	8.50
Educational background	
High school degree or lower	28.50
Bachelor degree	56.25
Master degree	12.25
Ph.D./MBA degree	3.00
Gender	
Male (=0)	59.75
Female (=1)	40.25
Age	
18-24	10.00
25-34	51.50
35-44	23.75
45-54	9.50
55-64	4.00
65 or older	1.25

3.3 Measures

Overall, we consider 14 variables in this study, amongst these two dependent variables, two independent variables, one moderator variable, and nine control variables. Table 21 shows the descriptive statistics and correlations for all study variables.

Table 21: Descriptive statistics and correlations (n=400)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Responsibility attribution	3.60	1.91													
2. Punishment	3.73	1.83	0.49***												
3. Power	0.49	0.50	0.34***	0.15**											
4. Foresight	0.50	0.50	0.03	0.10*	0.00										
5. Consumer mode	0.50	0.50	0.04	0.03	0.02	-0.03									
6. Citizenship	0.29	0.45	0.34***	0.14**	0.00	-0.07	0.00								
7. Household income	4.80	1.95	-0.16***	-0.10†	0.06	0.13**	-0.03	-0.53***							
8. Educational background	1.90	0.72	0.09†	0.01	-0.01	0.04	0.04	0.33***	-0.01						
9. Gender	0.40	0.49	-0.01	-0.05	0.03	0.03	-0.03	-0.19***	0.10*	-0.09†					
10. Age	2.50	1.02	-0.15**	-0.13**	-0.01	0.06	-0.07	-0.16***	0.05	-0.06	0.16**				
11. Responsibility attribution confidence	5.81	1.22	-0.01	0.00	0.01	0.07	-0.07	0.16**	-0.02	0.05	-0.07	0.06			
12. Mood	5.67	1.56	0.19***	0.07	0.05	0.02	0.04	0.23***	0.00	0.15**	0.04	0.06	0.21***		
13. Opinion conformance	3.86	1.57	0.31***	0.11*	0.01	0.00	-0.02	0.36***	-0.14**	0.16**	-0.06	-0.14**	0.01	0.16**	
14. Sustainability importance	5.13	1.60	0.16**	0.15**	0.00	-0.03	-0.09†	0.20***	-0.05	0.15**	0.10*	-0.03	0.09†	0.17***	0.22***

N=400 consumers; *p≤ 0.05, **p≤ 0.01, ***p≤ 0.001, †p≤ 0.10

The dependent variables for this study are the consumers' responsibility attribution and punishment decision. They are rated on a seven-point Likert scale (1="not at all", 7="entirely"). For the dependent variable responsibility attribution, the consumers answer to which extent they think that the buying firm is responsible for the actions of the supplier (Hartmann and Möller, 2014). The dependent variable punishment is calculated by two equally important measures. The participants state whether the buying firm should be punished by consumers through boycotting (Sen et al., 2001; Klein et al., 2004) and spreading negative word of mouth (Richins, 1983; De Matos and Rossi, 2008).

The independent variables are the buying firm's power (0=low, 1=high) and foresight (0=low, 1=high), and the moderator variable is the consumer's mode (0=passive, 1=evaluative). They are the experimental variables shown in the vignette, whereby the consumer mode is reinforced through two additional participant priming mechanisms (word-search puzzle and picture).

The control variables are the consumers' citizenship, household income, educational background, gender, and age, each rated in categories (see Table 20 for exact categories) and, as well, the consumers' confidence in their responsibility attribution, mood, conformance to the opinion of others, and attributed importance to buying sustainably produced food, each rated on a seven-point Likert scale (Barnett, 2014; Schmid and Mast, 2010; Feather and Simon, 1971; Fisher, 1993; Schwartz and Bilsky, 1990).

3.4 Manipulation and realism checks

To make sure that the participants identify the differences between the experimental treatment conditions of the three manipulated variables, we incorporate manipulation checks in the survey (Rungtusanatham et al., 2011). With regard to the consumer mode, an item checks whether the participants assume that firms, in general, are taking a "concern/fear" or "numbers/chances" perspective on paying below minimum wage. Moreover, on a seven-point Likert scale, two separate items ask participants whether the buying firm has a high level of power over the supplier and a high level of foresight of the potential for unsustainable incidents at the supplier. The results of three t-tests provide evidence that the participants understood the manipulations in the scenarios as intended when comparing the passive and evaluative mode (passive=0.24; evaluative=0.54; $t=-6.52$, $p \leq 0.001$), as well as low and high manifestations of power ($power_{low}$=2.63;

$power_{high}$=5.96; t =-20.41, p≤ 0.001) and foresight ($foresight_{low}$=2.72; $foresight_{high}$=5.61; t=-16.12, p≤ 0.001).

Moreover, we capture the realism of the vignette with three items on a seven-point Likert scale (Aguinis and Bradley, 2014; Reynolds, 2006). The manifestations of these items indicate that the participants regard their scenario as convincing (mean=5.36, standard deviation=1.37), can imagine themselves reading their scenario in reality (mean=5.63, standard deviation=1.50), and agree that there are very important ethical aspects with regard to the situation described in their scenario (mean=6.04, standard deviation=1.21).

4. Results

To assess the hypothesized relationships, we rely on a three-stage multiple linear OLS regression analysis. This method ensures very trustworthy and efficient parameter estimates in comparison to other methods (Field and Hole, 2003; Hayes, 2013).

4.1 Regression analysis for the US sample

When considering the US sample, the models RA1 to RA3 show the effects of the experimental variables on the dependent variable responsibility attribution. We focus on model RA2 as our main model since the adjusted R^2 and the F-statistics decrease from model RA2 to RA3. This is mainly the case due to the insignificant interaction effects in model RA3. With our main model RA2, we can explain 20.20% of the variance in consumers' responsibility attribution. In contrast, model P1 to P3 lay out the effects of the experimental variables on the dependent variable punishment for the US sample. We focus on model P3 as our main model since this model provides the highest amount of explanation in consumers' punishment decision, namely 15.38%. Table 22 shows the effects on both dependent variables for the US sample. The maximum obtained variance inflation factor (VIF) is 3.18, indicating that multicollinearity is not a concern in our regression models (Neter et al., 1996). Moreover, the residuals are normally distributed, and our data does not suffer from heteroscedasticity (Greene, 2008).

Table 22: Multiple linear regression results for the US sample

	Responsibility attribution			Punishment		
	RA1	**RA2**	**RA3**	**P1**	**P2**	**P3**
Experimental variables						
Power		**1.28*** (0.19)**	1.36*** (0.25)		0.97*** (0.21)	**1.54*** (0.28)**
Foresight		**0.42* (0.19)**	0.30 (0.24)		0.71*** (0.21)	**0.53* (0.27)**
Consumer mode		**-0.01 (0.19)**	-0.06 (0.33)		0.05 (0.21)	**0.45 (0.38)**
Interactions						
Power*Consumer mode			-0.15 (0.39)			**-1.14** (0.42)**
Foresight*Consumer mode			0.23 (0.38)			**0.31 (0.41)**
Control variables						
Household income	-0.03 (0.08)	**-0.09 (0.07)**	-0.09 (0.07)	-0.05 (0.07)	-0.11 (0.07)	**-0.11 (0.07)**
Educational background	-0.20 (0.15)	**-0.16 (0.13)**	-0.16 (0.13)	0.05 (0.15)	0.06 (0.14)	**0.11 (0.14)**
Gender	0.25 (0.21)	**0.14 (0.19)**	0.13 (0.19)	-0.27 (0.22)	-0.37† (0.21)	**-0.36† (0.21)**
Age	-0.28** (0.09)	**-0.29*** (0.09)**	-0.29*** (0.09)	-0.27** (0.10)	-0.28** (0.09)	**-0.26** (0.09)**
Responsibility attribution confidence	-0.15† (0.08)	**-0.18* (0.08)**	-0-17* (0.08)			
Mood	0.15* (0.07)	**0.14* (0.06)**	0.14* (0.06)	0.01 (0.07)	0.00 (0.07)	**-0.01 (0.07)**
Opinion conformance	0.15† (0.08)	**0.12† (0.07)**	0.13† (0.08)	0.06 (0.09)	-0.07 (0.08)	**-0.07 (0.08)**
Sustainability importance	0.09 (0.07)	**0.12† (0.07)**	0.11 (0.07)	0.21** (0.07)	0.23** (0.07)	**0.22** (0.07)**
Intercept	3.40***	**3.04*** **	3.06***	3.71***	3.23***	**2.98*** **
Observations	285	**285**	285	285	285	**285**
R^2	0.0942	**0.2330**	0.2344	0.0615	0.1645	**0.1896**
Adjusted R^2	0.0679	**0.2020**	0.1976	0.0378	0.1340	**0.1538**
F-statistics	4.42***	**8.28*** **	7.71***	3.08**	6.08***	**6.60*** **

Robust standard errors in parenthesis; *p≤ 0.05, **p≤ 0.01, ***p≤ 0.001, †p≤ 0.10

Concerning the results of the regression analysis for the US sample, we find that the buying firm's power positively influences the negative legitimacy spillover from the supplier, thus providing support for hypothesis 1. The results for both consumer responsibility attribution (β=1.28; $p \leq 0.001$) and punishment (β=1.54; $p \leq 0.001$) are positive and significant in this case. Moreover, likewise, the buying firm's foresight has a positive influence on the negative legitimacy spillover from the supplier. Therefore, we can also accept hypothesis 2. Again, the results for both dependent variables consumer responsibility attribution (β=0.42; $p \leq 0.05$) and punishment (β=0.53; $p \leq 0.05$) are significantly positive. However, out of the four hypothesized interaction effects, only one is significant, leading to a partial acceptance of hypothesis 3a and a rejection of hypothesis 3b. We find support that for consumers in the evaluative mode, the extent of power-related punishment is higher for a low level of buying firm power and lower for a high level of buying firm power than for consumers in the passive mode (β=-1.14; $p \leq 0.01$). Consequently, for consumers in the evaluative mode, the power-related punishment is less differentiated than for consumers in the passive mode. This counterintuitive finding can be explained by the fact that the consumers in the evaluative mode ponder and rely more on their own opinion concerning the justified punishment of the buying firm than focusing on the power-related facts given in their scenario. Conversely, in the passive mode, the consumers focus on the power-related facts given in their scenario and punish the buying firm as it is intended. Figure 8 provides a graphical illustration of the significant interaction effect for the US sample.

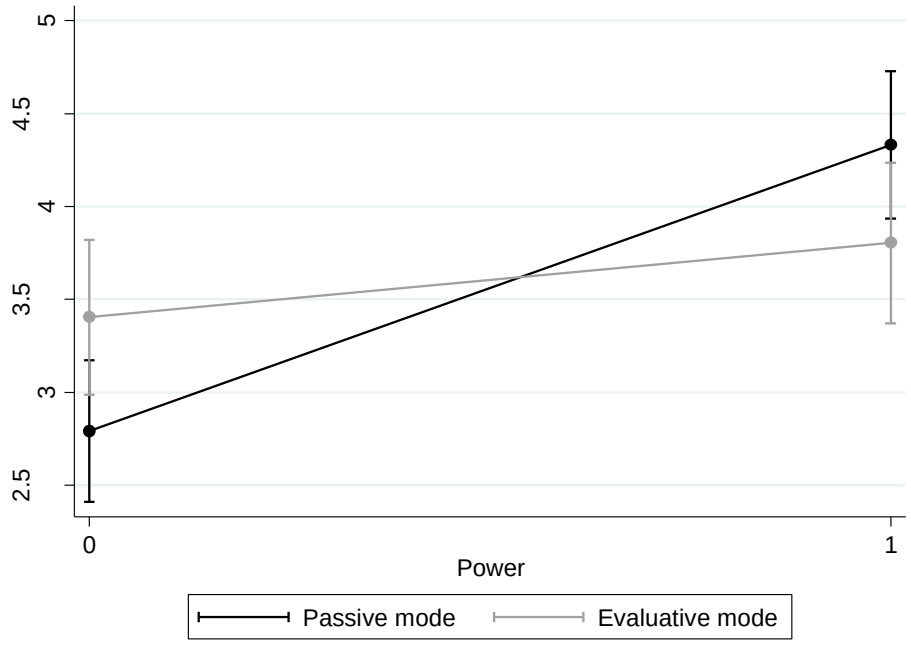

Figure 8: Interaction between "Consumer mode" and "Power" for the "Punishment" of the US sample

4.2 Regression analysis for the joint US and Indian sample

When including participants from both the US and India, model RA4 to RA6 show the effects of the experimental variables on the dependent variable responsibility attribution, and model P4 to P6 point out the effects of the experimental variables on the dependent variable punishment. In this case, we rely on the estimates of our main models RA5 when explaining the consumers' responsibility attribution concerning the buying firm since the adjusted R^2 increases only minimally by 0.2% and the F-statistics decreases from model RA5 to RA6. For the dependent variable punishment, we rely on model P6 since it by far explains the highest amount of variance. With our main model RA5, we can explain 27.80% of the variance in consumers' responsibility attribution, and our main model P6 accounts for 8.93% of the variance of consumers' punishment decision. Table 23 illustrates the effects on both dependent variables for the joint country sample. The maximum obtained VIF is 3.10, indicating that multicollinearity is again not a concern in these two country models (Neter et al., 1996). Moreover, as for the sole US sample, for the joint US and Indian sample, the residuals are normally distributed, and the data does not suffer from heteroscedasticity (Greene, 2008).

Table 23: Multiple linear regression results for the joint US and Indian sample

	Responsibility attribution			Punishment		
	RA4	**RA5**	**RA6**	**P4**	**P5**	**P6**
Experimental variables						
Power		**1.26*** (0.16)**	1.42*** (0.22)		0.56** (0.18)	**1.11*** (0.25)**
Foresight		**0.24 (0.16)**	0.06 (0.22)		0.48** (0.18)	**0.37 (0.24)**
Consumer mode		**0.09 (0.17)**	0.09 (0.29)		0.11 (0.18)	**0.54† (0.31)**
Interactions						
Power*Consumer mode			-0.33 (0.33)			**-1.09** (0.36)**
Foresight*Consumer mode			0.34 (0.33)			**0.20 (0.36)**
Control variables						
Citizenship	1.11*** (0.29)	**1.05*** (0.27)**	1.02*** (0.27)	0.24 (0.26)	0.23 (0.26)	**0.18 (0.26)**
Household income	0.00 (0.06)	**-0.03 (0.05)**	-0.04 (0.05)	-0.04 (0.06)	-0.07 (0.05)	**-0.08 (0.05)**
Educational background	-0.14 (0.14)	**-0.13 (0.12)**	-0.11 (0.12)	-0.13 (0.15)	-0.14 (0.14)	**-0.08 (0.14)**
Gender	0.19 (0.19)	**0.15 (0.17)**	0.13 (0.17)	-0.11 (0.19)	-0.13 (0.18)	**-0.14 (0.18)**
Age	-0.17* (0.08)	**-0.16* (0.08)**	-0.16* (0.08)	-0.20* (0.09)	-0.21* (0.01)	**-0.19* (0.08)**
Responsibility attribution confidence	-0.11† (0.07)	**-0.12† (0.06)**	-0.11† (0.06)			
Mood	0.14* (0.06)	**0.13* (0.05)**	0.12* (0.05)	0.05 (0.06)	0.04 (0.06)	**0.04 (0.06)**
Opinion conformance	0.23*** (0.06)	**0.22*** (0.06)**	0.23*** (0.06)	0.04 (0.07)	0.04 (0.07)	**0.04 (0.06)**
Sustainability importance	0.06 (0.06)	**0.07 (0.06)**	0.07 (0.06)	0.15* (0.06)	0.16* (0.06)	**0.15* (0.06)**
Intercept	2.54***	**2.02*** **	1.99***	3.45***	3.08***	**2.81*** **
Observations	400	**400**	400	400	400	**400**
R^2	0.1874	**0.2998**	0.3035	0.0556	0.0967	**0.1190**
Adjusted R^2	0.1687	**0.2780**	0.2782	0.0363	0.0711	**0.0893**
F-statistics	11.60***	**17.67*** **	15.91***	2.92**	3.95***	**4.89*** **

Robust standard errors in parenthesis; *p≤ 0.05, **p≤ 0.01, ***p≤ 0.001, †p≤ 0.10

The regression with the joint US and Indian sample indicates that the results are similar when comparing US and Indian consumers. Solely, the foresight of the buying firm about the unsustainable incident is less critical for Indian consumers than for US consumers. This shows that Indian consumers do not have the same knowledge about the intangible foresight dimension as US consumers, or cannot prefigure it in the same way as US consumers. Consequently, due to the insignificant influence of the buying firm's foresight on the consumers' responsibility attribution and punishment decision, we have to reject hypothesis 2. However, the buying firm's power positively influences the negative legitimacy spillover from the supplier to the buying firm, supporting hypothesis 1, as it is also the case for the sole US sample. Again, the results for both consumer responsibility attribution (β=1.26; $p \leq 0.001$) and punishment (β=1.11; $p \leq 0.001$) are positive and significant. Also, from the four hypothesized interaction effects, only the interaction between the consumer mode and the power-related punishment of the buying firm is significant (β=-1.09; $p \leq 0.01$), leading to a partial acceptance of hypothesis 3a and a rejection of hypothesis 3b. Figure 9 provides the graphical illustration of the significant interaction effect for the joint regression of the US and Indian sample.

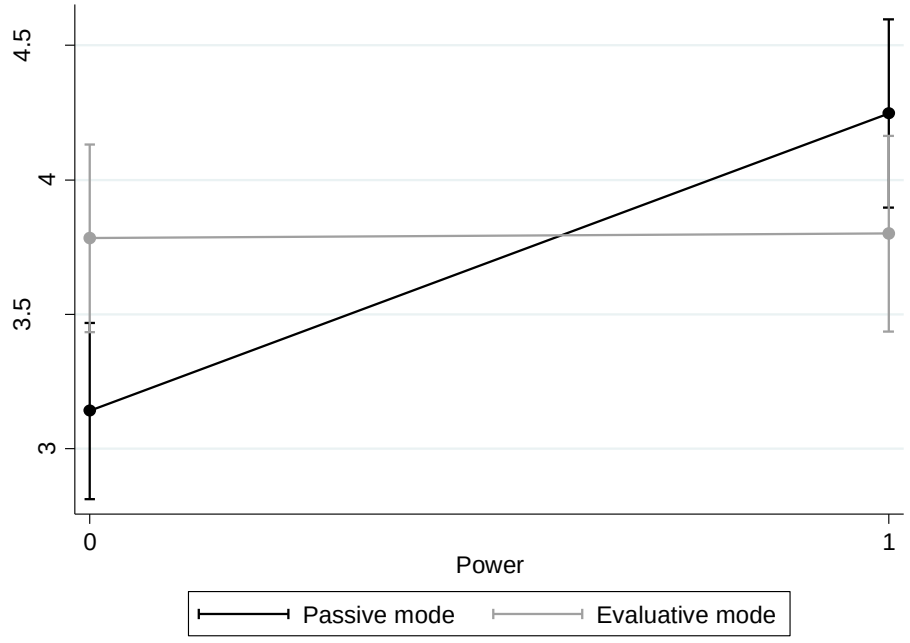

Figure 9: Interaction between "Consumer mode" and "Power" for the "Punishment" of the joint US and Indian sample

Furthermore, the results from two t-tests show that consumers from India make a significantly higher responsibility attribution (India=4.63; US=3.18; t=-7.31, $p \leq 0.001$) and punishment decision (India=4.14; US=3.56; t=-2.87, $p \leq 0.01$) than consumers from the US, although the

buying firm's foresight over the supplier's activities is less critical for them than for US consumers. This provides support for hypothesis 4.

To ensure the robustness of the cross-cultural comparison between participants from the US and India, we measure the time the participants spent abroad in their life (Ribbink and Grimm, 2014). On average, the participants spent 10.73 months abroad in their life, whereby 80% of the participants spent less than a year abroad, indicating that the participants are strongly influenced by the cultural values of their country of origin. Despite the low time spent abroad by the participants, we also compare their responses to the eight cross-cultural items related to the cross-cultural dimensions "power distance" and "individualism" (Hofstede et al., 2013; Hofstede and Minkov, 2013), which are relevant for this study. The results show the expected differences between the US and Indian sample. The manifestation of the dimension "power distance" is lower for the US sample than for the Indian sample. In contrast, the manifestation of the dimension "individualism" is higher for the US sample than for the Indian sample. This also shows that the participants represent typical citizens of their country of origin concerning the two tested cross-cultural dimensions.

4.3 Reasoning behind the participants' responsibility attribution and punishment decision

This study leverages a voluntary post hoc qualitative inquiry to obtain a more detailed understanding of the participants' responsibility attribution and punishment concerning the buying firm (Morse et al., 2002). In this vein, the participants could provide open-ended qualitative reasoning for their responsibility attribution and punishment decision. 397 out of 400 participants responded to the request. We analyzed and coded each answer individually with a specific focus on the three manipulated study constructs. Table 24 provides an extract of the participants' responses for the eight treatment conditions.

Table 24: Consumer reasoning behind responsibility attribution and punishment decision (extract out of n=397 statements)

Treatment condition	Statements
High power High foresight Passive mode	• "They have to have known something about this with the amount of power and foresight they have." • "Paying the workers much below the national minimum wages and making profit out of that money is not forgivable. It made the workers suffer in a number of ways." • "They deal with shady business, then they deserve what they pay for."

High power Low foresight Passive mode	• "Grocery Co is responsible for much of Ready-Meal Co.'s business. If they wanted this to change, they would have." • "If you are grocery chain with over 200 stores, then you must be aware of your responsibility that when you carry a product in your store, you are also innately advertising it and if you are the businesses' main revenue, you ought to carry some burden for your decisions on their products and brand." • "Because the economy is bad enough as it is and it's getting worse with companies that don't want to pay for employees to work. If it weren't for the employees these companies would be nothing. It's highly unethical and unfair."
Low power High foresight Passive mode	• "Grocery Co. should not be punished as it is a very small voice here, but as human beings, we always target what we see on the front line and forget who the mastermind behind the problem is." • "Grocery Co. should still understand its partners and their values and most likely had some level of intuition or knowledge about shoddy labor practices so they still have a small level of culpability." • "Grocery Co. is not entirely responsible for the issue at hand and they should be warned by the consumer to stop doing business with Ready-Meal Co."
Low power Low foresight Passive mode	• "I went with how I felt, I chose the numbers based on how I felt about the situation." • "I just went with my gut feelings/intuition based on the material given to me." • "Consumers should not encourage these kind of unethical activities and if they face loss, then they will know the importance of ethical values."
High power High foresight Evaluative mode	• "Grocery Co. is still choosing to do business with them despite them doing this and having a bad reputation. If they have a great deal of power of the company because they are the source of the most of their sales, then they would have the power to force them to do better or lose their business." • "Grocery Co. has a high level of power over Ready-Meal Co. Hence, it has maximum responsibility for all the shortcomings." • "It is important to take responsibility and set the required authority to check for any maladministration. Grocery Co. is indirectly supporting the malfunctioning Ready-Meal Co. Since, it sets policy, so have to adhere to them and regular inspection was a must."

High power Low foresight Evaluative mode	• "While they do have a lot of power over Ready-Meal Co., they are not in charge. They only are in charge as far as Ready-Meal Co. will let them be, in other words, Ready-Meal Co. can do what they want, but it might cost them business. I think Ready-Meal Co. made this choice, but Grocery Co. should have found out sooner about the wage issue." • "Grocery Co. has no doubt failed in its responsibility. But, negative word of mouth and boycotting are not solutions. What we instead can focus on is a boycott of Ready-Meal Co products. This will have financial implications for both companies and Ready-Meal Co. will be forced to pay a fair wage to all employees." • "While I think the company should face some sort of punishment, if people start to boycott and stop buying products that might force the company to start laying off people and then that wouldn't solve the problem about the minimum wage."
Low power High foresight Evaluative mode	• "I think Grocery Co. generally has a good policy regarding social responsibility. As they represent only a small amount of the Ready-Meal Co.'s business, I think it would be hard for them to be the force of change at Ready-Meal Co." • "Grocery Co. is a customer with a low level of power over Ready-Meal Co. and represents only a small proportion of its total sales. Hence, Grocery Co. is only slightly responsible for the actions of Ready-Meal Co. That being said, however small the business with Ready-Meal Co., Grocery Co. should be aware of the practices involved in Ready-Meal Co. and make sure that it is doing business with a company that practices fair trade and treats its employees well […] I do not believe that Grocery Co. should be held entirely responsible for Ready-Meal Co.'s actions and should be given a second chance." • "Since Grocery Co. has little power over Ready-Meal Co., in that Grocery Co. represents a small portion of Ready-Meal Co.'s overall sales, I don't think they are really too much to blame for Ready-Meal Co.'s actions. However, Grocery Co. did have good foresight that Ready-Meal Co. was not behaving in an ethical way toward its workers, so they should take a small amount of the blame, as they could have chosen to not buy Ready-Meal Co.'s products. If a lot of companies made this same decision, it could affect how Ready-Meal Co. does business […]"
Low power Low foresight Evaluative mode	• "Grocery Co. shouldn't be punished for the actions of its supplier. While it may be unreasonable for Grocery Co. to continue its relationship with Ready-Meal Co. despite learning of its wage practices, consumers must understand that Grocery Co. cannot compel Ready-Meal Co. to pay fair wages, especially since Grocery Co. has little to no power […]" • "Grocery Co. has very minimum control over Ready-Meal Co. Ready-Meal Co. has no past unsustainable incidents. Even the auditors could not find any unethical situations. So I think Grocery Co. should not be punished." • "I don't think it knew of the problems with the other company and I don't think people should punish them for it. It's not like they have any power as to what the company does anyway. How were they supposed to know?"

It is noteworthy that 23 of the participants mention the attribution theory dimension controllability itself in their qualitative response although no explicit reference was given to this dimension in the vignette or the questions the participants had to answer. This indicates that the two manipulated constructs power and foresight fit well with the controllability dimension.

The utilized qualitative inquiry also provides the possibility to detect additional factors influencing the consumers' responsibility attribution and punishment decision regarding the buying firm. It is evident that another essential factor for the participants is whether the buying firm, in the end, continues the relationship with the unsustainable supplier. 16 participants state that continuing the relationship is not the right way since it shows that the buying firm *does not care* and because it *encourages the unethical behavior* of the supplier. Five participants even mention that the buying firm should immediately *stop doing business* with its unsustainable supplier.

5. Concluding discussion

This study relies on attribution theory to scrutinize how the characteristics of the inter-organizational buyer-supplier relationship affect the extent of the negative legitimacy spillover to the buying firm due to its socially unsustainable supplier. To answer our research question, we executed a scenario-based experiment with student samples from the United Kingdom and 400 consumers from the US and India, which we recruited through the crowdsourcing platform Amazon Mechanical Turk (AMT).

Our analysis shows that the controllability of the buying firm over the unsustainable supplier (operationalized through the power of the buying firm over the unsustainable supplier and the foresight of the buying firm on the unsustainable supplier's activities) positively influences the extent of the negative legitimacy spillover from the unsustainable supplier to the buying firm (operationalized through the consumers' responsibility attribution and punishment decision with respect to the buying firm) for consumers from the US. Moreover, for US consumers, the consumers' mode moderates the power-related punishment of the buying firm. In the evaluative mode (the consumer is cognitively activated), the US consumers' punishment of the buying firm is higher for a low buying firm power and lower for a high buying firm power than in the passive mode (the consumer is not cognitively activated). Even though we could not find foresight-related negative legitimacy spillovers, the results remain consistent when

including consumers from India. Furthermore, for consumers from India, we observe significantly higher overall legitimacy spillovers to the buying firm due to the socially unsustainable supplier incident even though the foresight dimension is less important for them.

5.1 Scholarly contributions

First, and foremost, this is the first study, which focuses on the boundary conditions of legitimacy spillovers and more specifically on the exact determinants of the inter-organizational relationship (in this case the buyer-supplier relationship), which can lead to different extents of negative legitimacy spillovers from the legitimacy source (in this case the unsustainable supplier) to the legitimacy destination (in this case the buying firm). Our results reveal that the controllability of the legitimacy source (in our case the buying firm's power and foresight) is an essential indicator for negative inter-organizational legitimacy spillovers.

With the focus of our study on the attributional dimension controllability, we also broaden attribution theory since we add the distinction between the legitimacy assessor (in our case the consumer) in a passive and an evaluative mode to this dimension, which formally only captures the degree of intentional control of the legitimacy destination (accused) over the legitimacy source (cause) (Tost, 2011; Harvey et al., 2014). Our results reveal that the differentiation of these two legitimacy assessor modes is solely relevant for the punishment decision and not for the responsibility attribution of the legitimacy assessor, indicating that cognitive activation only becomes relevant when an actual action would result from the decision.

Today, the majority of researchers view legitimacy as a "property", "resource", or "capacity of an entity" (Suddaby et al., 2017). With our empirical study, we show that this view is limited since legitimacy lies in the eye of the beholder and is, for instance, depending upon the individual legitimacy assessors' mode and country of origin. Thereby, we show that the legitimacy assessors' power-related punishment is less differentiated in the evaluative mode than in the passive mode and that the overall legitimacy spillover from the legitimacy source to the legitimacy destination is higher for legitimacy assessors from India than for legitimacy assessors from the US.

Finally, on a more detailed level, we enhance the understanding of consumer behavior vis-a-vis unsustainable conduct along the supply chain by connecting the research stream on legitimacy spillovers with the research stream on corporate social responsibility. In this vein, we expand the discourse on legitimacy spillovers with the causal mechanism of consumers'

responsibility attribution and punishment decision based on characteristics of the inter-organizational buyer-supplier relationship.

5.2 Practical contributions

Our results show buying firm managers the extent of negative legitimacy spillovers they have to expect in the case of a socially unsustainable occurrence of one of their suppliers depending on their customers' country of origin, and their own firm's power over the supplier and foresight on the supplier's activities. Buying firm managers should expect the highest negative legitimacy spillovers attributed by consumers when their firm has a high power over the unsustainable supplier. This is the case when their firm represents a large proportion of the supplier's total sales and when the supplier has a large dependence on their firm for its profitability. The power-related legitimacy spillovers are relevant for both consumers from the US and India. Moreover, also a high foresight of their firm on the unsustainable supplier's activities leads to significant legitimacy spillovers, however, only for consumers from the US. A high foresight is prevalent when their supplier has a poor reputation and a history of previous unfavorable incidents, and when audits revealed undesirable issues.

With our distinction between legitimacy assessors from the US and India, we also show buying firm managers differences in the extent of responsibility attribution and punishment for consumers from different countries. In this vein, our results indicate that buying firms overall receive higher legitimacy spillovers due to a socially unsustainable supplier incident for consumers from India than for consumers from the US. Therefore, buying firm managers should also take into account that the extent of legitimacy spillovers can be different concerning the country in which they operate.

5.3 Limitations and future research

Naturally, this study has some limitations. The use of EVM makes it only possible to evaluate the legitimacy assessors' opinion with regard to responsibility attribution and justified punishment, which could be different from their actual behavior. Moreover, dependent on their social context, there might be substantial reasons for legitimacy assessors to suppress their opinion like for instance totalitarian regimes (Cohen and Sherman, 2014). Lastly, legitimacy assessors are often not only exposed to a single validity cue but to multiple, partly conflicting validity cues like for instance conflicting newspaper articles or different opinions of other legitimacy assessors (Bitektine and Haack, 2015).

Future research should capture individual differences among legitimacy assessors in more detail. Among these is the exact degree to which the legitimacy assessor can socially identify with a specific accused organization (Lange and Washburn, 2012). Besides, future research should include further legitimacy assessors like for instance managers and journalists in the analysis of the responsibility attribution and punishment decision since every legitimacy assessor has a different relationship with the buying firm and different interests concerning sustainable behavior (Freeman, 1984). Moreover, the reaction of legitimacy assessors to unsustainable organizations from different industries and different adverse unsustainable occurrences should be tested. By employing the Likert scale, we considered legitimacy as an ordinal variable in which some organizations have more legitimacy than others. Future research should confirm whether this view is correct or whether legitimacy should be better seen as a dichotomous concept in which organizations are either legitimate or not (Suddaby et al., 2017). Furthermore, next to studying legitimacy and illegitimacy, future research should also focus on re-legitimation, that means on how organizations can regain legitimacy after they have been considered as illegitimate (Vaara and Tienari, 2011). Finally, the relationship between a buying firm and a supplier is part of a more complex network of other relationships (Bode and Wagner, 2015). Beyond Tier-1 suppliers, there are also indirect, lower-tier suppliers that are even less controllable for buying firms (Mishra et al., 1998). Therefore, future research should study whether our results are also valid for misconduct of these lower-tier suppliers.

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Curriculum Vitae

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Education

Since 10/2015	Doctorate at the Chair of Logistics Management, ETH Zurich (Switzerland)
10/2013 - 09/2015	Master studies in Industrial Engineering at the Karlsruhe Institute of Technology (Germany)
07/2014 - 12/2014	Semester abroad at the University of Technology Sydney (Australia)
10/2010 - 07/2013	Bachelor studies in Industrial Engineering at the Karlsruhe Institute of Technology (Germany)
08/2012 - 01/2013	Semester abroad at Linköping University (Sweden)
09/2001 - 06/2010	Abitur at Deutschhaus-Gymnasium Würzburg (Germany)

Professional experience

Since 10/2015	Research associate at the Chair of Logistics Management, ETH Zurich (Switzerland)
10/2017 - 12/2017	Visiting researcher at the Operations Group, University of Cambridge (England)
03/2015 - 09/2015	Master thesis at Daimler AG (Germany)
04/2015 - 08/2015	Teaching assistant at the Institute for Material Handling and Logistics, Karlsruhe Institute of Technology (Germany)
03/2013 - 07/2013	Bachelor thesis at Lufthansa Cargo AG (Germany)
01/2013 - 05/2013	Consultant (project leader) at Electro Optical Systems GmbH (Germany)
09/2011 - 03/2012	Consultant (project member) at Commerzbank AG (Germany)
10/2011 - 03/2012	Teaching Assistant at the Chair of Economic Policy and Research, Karlsruhe Institute of Technology (Germany)
08/2011 - 09/2011	Management Consulting Intern at Karlsruhe Technology Consulting GmbH (Germany)
08/2010 - 09/2010	Intern at CareFusion Inc. (Germany)

Scholarships and awards

Since 02/2012	Scholarship from McKinsey Firsthand
05/2013 - 09/2015	Scholarship from the Foundation of German Business (Stiftung der Deutschen Wirtschaft)
10/2013	Award from the Karlsruhe Institute of Technology for Outstanding Student Commitment
08/2012 - 01/2013	Erasmus Scholarship supporting an exchange semester in Linköping, Sweden

Voluntary activities

Since 09/2017	Member of the Council of Supply Chain Management Professionals (Switzerland)
10/2010 - 09/2015	Executive board member for Human Resources and advisory board member for Human Resources and Acquisition & Customer Care at the student-run management consultancy delta e.V. (Germany)
09/2013 - 04/2014	Delegate at the National Model United Nations conference New York (USA)

Publications

Reinerth, D., Busse, C., and Wagner, S.M. 2018. "Using country risk to inform sustainable supply chain management: A design science study." *Journal of Business Logistics*, in press.

Kurpjuweit, S., Reinerth, D., and Wagner, S.M. 2018. "Supplier innovation push: Timing strategies and best practices." *Research-Technology Management* 61(2):47-55.

Conference papers/presentations

Reinerth, D., Busse, C., and Wagner, S.M. 2018. "Increasing order volume through sustainable reputation: A study on buyer-supplier relationships." 78th Annual Meeting of the Academy of Management, Chicago (Illinois), USA, August 10th-14th (accepted).

Reinerth, D., Busse, C., and Wagner, S.M. 2018. "Increasing order volume through sustainable reputation: A study on buyer-supplier relationships." 30th Annual NOFOMA Conference, Kolding, Denmark, June 13th-15th.

Reinerth, D., Busse, C., and Wagner, S.M. 2017. "Achieving competitive advantage through sustainable firm reputation: A longitudinal study on buyer-supplier relationships." 28th POMS Annual Conference 2017, Seattle (Washington), USA, May 5th-8th.

Reinerth, D., Busse, C., and Wagner, S.M. 2016. "Development of a supply chain sustainability risk map: Insights from a design science study with a technology firm." 23rd EurOMA Conference, Trondheim, Norway, June 17th-22nd.