Assessing the stock performance outcomes, antecedents and preventive measures of organizational misconduct: An empirical and conceptual inquiry into unethical firm practices

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Articles

This cumulative doctoral thesis is composed of six articles, which are either already published or currently under review in peer-reviewed academic journals. For reasons of usefulness, articles presented in this thesis do not follow the order of publication/preparation.

1) Bouzzine, Y. D. (2021). Stock price reactions to environmental pollution events: A systematic literature review of direct and indirect effects and a research agenda. *Journal of Cleaner Production* (IF: 9.297), 316, 128305. https://doi.org/10.1016/j.jclepro.2021.128305.

2) Bouzzine, Y. D., & Lueg, R. (2020). The contagion effect of environmental violations: The case of Dieselgate in Germany. *Business Strategy and the Environment* (IF: 10.302), 29(8), 3187–3202. https://doi.org/10.1002/BSE.2566.

3) Bouzzine, Y. D., & Lueg, R. (2022). The reputation costs of executive misconduct accusations: A stock market perspective on #MeToo in the US. *Scandinavian Journal of Management* (IF: 2.433), 38(1), 101196, https://doi.org/10.1016/j.scaman.2022.101196.

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4) Bouzzine, Y. D., & Lueg, R. (2021). The shareholder value effect of system overloads: An analysis of investor responses to the 2003 blackout in the US. *International Journal of Energy Economics and Policy*, 11(6), 538-543. https://doi.org/10.32479/ijeep.11756.

5) Bouzzine, Y. D., & Lueg, R. (2021). Moral Licensing Theory, Corporate Sustainability, and Organizational Misconduct: A Conceptual Framework. Currently under review in *Organization Management Journal*.

6) Tabiica, I., Bouzzine, Y. D., Galandi, N., & Lueg, R. (2021). What can Nudges offer to stop Workplace Sexual Harassment? A Conceptual Framework. Currently under review in *World Development Sustainability*.

Article 1 has been single-authored by Yassin Denis Bouzzine. Articles 2, 3, 4, and 5 have been authored jointly by Yassin Denis Bouzzine and Prof. Dr. Rainer Lueg. Article 6 has been jointly authored by Ion Tabiica, Yassin Denis Bouzzine, Dr. Nadine Galandi, and Prof. Dr. Rainer Lueg. All articles presented in this thesis are formatted according to the guidelines of respective journal outlets and, therefore, exhibit differences regarding referencing style and design.

Year of publication: 2022

Conference and workshop presentations

I have participated in the following academic conferences and workshops and presented my research papers there:

1) 36th EGOS Colloquium (2020): Organizing for a Sustainable Future: Responsibility, Renewal & Resistance – Sub-theme: *Studying Organizational Wrongdoing, Corruption, and Scandals: Where Are We and Where Should We Go?*

2) Paper development workshop (PDW) at the 36th EGOS Colloquium (2020): *Challenges to Multidisciplinary Research at the Borderlands between State, Market and Civil Society*.

3) 12th EURAM Early Career Colloquium (ECC) (2021): *Successfully managing the unavoidable trade-offs between research, teaching and service*.

4) EURAM 2021: Reshaping capitalism for a sustainable world – Special Interest Group: *Business for Society*.

5) 37th EGOS Colloquium (2021): Organizing for an Inclusive Society: Meanings, Motivations & Mechanisms – Sub-theme: *Financial Markets and Corporate Sustainability*.

6) 81st Academy of Management Annual Meeting (2021): Bringing the Manager Back in Management – Division group: *Social Issues in Management*.

7) Herbsttagung 2021 der Wissenschaftlichen Kommission Nachhaltigkeitsmanagement des Verbands der Hochschullehrer der Betriebswirtschaftslehre (VHB). *Rahmenkonzepte der Nachhaltigkeitsmanagement-Forschung und ihr möglicher Beitrag zu einer nachhaltigen Entwicklung*.

Achievements

1) Best Research Paper Award (2020). Leuphana University Lüneburg, Faculty of Business and Economics.

2) Academy of Management Annual Meeting Top 10% Paper (2021). Academy of Management

3) Best Student Paper Award (2021). Academy of Management, Social Issues in Management Division.

4) Inclusion in the WiWi-Talents program for outstanding students (2021). WiWi-Media AG.

Acknowledgments and dedication

While this doctoral thesis is primarily the product of my research, analysis, and writing, I want to use this section to thank significant persons who made this doctoral thesis possible in the first place.

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I dedicate my doctoral thesis to my mother *Selma Bouzzine*, who unfortunately passed away in 2016 and could not take part in my doctoral journey. I know that you would have been immensely proud of the achievements of your latest born. Besides, I dedicate my doctoral thesis to my father *Sidi Mohamed Bouzzine*, my sister *Yasemin Berardi*, my brothers *Maroan Bouzzine* and *Abdelkader Bouzzine*, and my fiancée *Svitlana Sapolski*.

Abstract

This doctoral thesis deals with the topic of organizational misconduct and covers the three salient research streams in this area by addressing its performance outcomes, antecedents, and preventive measures. Specifically, it is concerned with the question of how different forms of misconduct are reflected in the stock performance of related organizations, thereby, covering the three pillars of corporate sustainability environmental, social, and governance (ESG). Furthermore, it aims to conceptualize how individual cognitive biases may lead to misconduct, therefore, potentially representing an antecedent and how existing management control systems can be enhanced to effectively address specific forms of misconduct, respectively.

To these ends, I first review the research stream of stock price reactions to environmental pollution events in terms of the underlying research samples, methodological specifications, and theoretical underpinnings. Based on the findings of the systematic literature review (SLR), I perform three stock-based event studies of the Volkswagen diesel emissions scandal (Dieselgate), workplace sexual harassment (#MeToo accusations), and the 2003 blackout in the US to cove the three ESG dimensions, respectively. In line with the SLR, my event studies reveal substantial stock losses to firms involved in misconduct that are eventually even accompanied by a spillover effect to uninvolved bystanders.

Then, I review the extant literature conceptually to develop a framework outlining how moral licensing as an individual cognitive bias might lead to a self-attribution of corporate sustainability, a consecutive accumulation of moral credit, and a later exchange of this credit by engaging in misconduct afterward.

Finally, I assess existing workplace sexual harassment management controls, such as awareness training and grievance procedures critically in another conceptual analysis. Based on the shortcomings stemming from management controls' focus on compliance and negligence

of moral duties, I introduce five specific nudges firms should consider to enhance their existing management controls and eventually prevent occurrences of workplace sexual harassment.

Based on the six distinct articles within this doctoral thesis, I outline its limitations and point at directions for future research. These mainly address providing further evidence on the long-term performance effects of organizational misconduct, enriching our knowledge on further cognitive biases eventually leading to misconduct, and conceptualizing nudging beyond the use-case of workplace sexual harassment.

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1 Introduction

Within research on corporate social responsibility (CSR), the topic of organizational misconduct has increasingly emerged as a salient topic. Thereby, researchers are extensively concerned with the antecedents (Aguilera & Vadera, 2008; Andreoli & Lefkowitz, 2009; Greve et al., 2010; Vardi, 2001; Zona et al., 2013) and the consequences (Greve et al., 2010; Park et al., 2020; Pozner, 2008) of organizational misconduct. In the latter research field, the question of how organizational misconduct is reflected in the financial performance of firms plays a particularly important role (Bonini & Boraschi-Diaz, 2013; Greve et al., 2010), while research on how investors react to organizational misconduct receives significant academic interest (Bouzzine & Lueg, 2020; Paruchuri & Misangyi, 2015).

Despite this increasing relevance in academia and the number of publications in renowned academic journals, there is still potential for research in this field. First, it exhibits significant differences concerning theoretical underpinning, methodological rigor, and perspectives. Second, research gaps can be identified regarding the insufficient examination of salient incidents of organizational misconduct that occurred in the (recent) past. Third, considerations of a spillover dimension when examining how organizational misconduct affects firms' stock performance are yet scarce (Bouzzine & Lueg, 2020; Jonsson et al., 2009; Paruchuri & Misangyi, 2015). Fourth, concerning the three distinct pillars of sustainability (environmental, social, and governance (ESG)), a significant difference in research output can be identified for these dimensions. While the body of stock market studies on environmental misconduct is abundant (Bosch et al., 1998; Dasgupta et al., 2001; Dasgupta et al., 2006; Flammer, 2013; Gupta & Goldar, 2005; Hamilton, 1995; Khanna et al., 1998; Klassen & McLaughlin, 1996; Lanoie et al., 1998; Lundgren & Olsson, 2010; Xu et al., 2012), research on social misconduct (Frooman, 1997; Gunthorpe, 1997; Song & Han, 2017) and governance misconduct (Beatty et

al., 2013; Jonsson et al., 2009; Yu et al., 2015) tends to be rather scarce. I aim to contribute to filling these research gaps by posing the following research question:

RQ1: How do investors react to incidents of organizational misconduct?

To answer this research question, I first reviewed the comprehensive research field dealing with the stock price reaction to environmental misconduct concerning the empirical findings, theoretical underpinnings, and methodological aspects. This aims, on the one hand, to review this extensive research field and to provide meaningful research recommendations, on the other hand, to derive a state-of-the-art in methodological and theoretical terms that can be employed in subsequent empirical studies. Second, we conduct a stock-based event on the Volkswagen diesel emissions scandal (Dieselgate), thereby, considering a spillover dimension by examining the impact on German peer car manufacturing firms. Third, to shed light on how social misconduct is reflected in a firm's financial performance, we employ the seminal case of sexual harassment accusations within the #MeToo-movement to analyze the stock performance outcomes for the firm affiliated with the accused person. Fourth, we focus on the governance dimension of sustainability by analyzing the shareholder value effect of the 2003 blackout in the US as a consequence of a severe system overload due to governance issues at the responsible firm.

Next to focusing on the performance outcomes, research on organizational misconduct is also concerned with the antecedents of unethical practices (Greve et al., 2010) and how to prevent misconduct in the first place (Miethe & Rothschild, 1994; Szwajkowski, 1992). Both streams are primarily driven by an organizational perspective, neglecting the role of psychological attributes of individuals when looking at both the antecedents and the prevention measures (Lueg & Radlach, 2016; Shadnam & Lawrence, 2011). To account for this negligence of the individual, I pose the following research questions:

RQ2: How do individual antecedents (cognitive biases) lead managers to act unethically?

RQ3: How can preventive measures help to effectively diminish organizational misconduct?

To contribute to these streams of literature, this thesis includes conceptual analyses of cognitive managerial biases as antecedents and preventive measures of organizational misconduct. As for the antecedents of organizational misconduct, we conceptually examine the role of cognitive biases in executives in committing misconduct by illustrating how past CSR potentially functions as a moral license to engage in prospective misconduct. Based on the problem of workplace sexual harassment that has been addressed in the empirical examination of #MeToo allegations, we outline how organizational nudges might represent a functioning governance mechanism that can help to overcome the limitations of traditional management control systems.

The remainder of this thesis is organized as follows: Section 2 comprises the systematic literature review (SLR) on environmental misconduct. Sections 3, 4, and 5 represent the event study analyses of Dieselgate, #MeToo allegations, and the 2003 blackout, respectively. Section 6 analyzes the role of moral licensing as an executive cognitive bias in engaging in misconduct and therewith covers the antecedent dimension. Section 7 outlines how organizational nudges can help to effectively address the issue of workplace sexual harassment and to overcome the limitations of traditional management control systems. Finally, Section 8 provides the conclusion of this paper by summarizing the main findings and outlining the limitations of this thesis, and consecutive recommendations for future research.

2 Stock price reactions to environmental pollution events: A systematic literature review of direct and indirect effects and a research agenda

Abstract

Stock price reactions to environmental pollution events are spiking increasing academic interest. This systematic literature review covers 38 stock-based event studies from 1990–2020. I categorize the extant literature into four subfields: pollution disclosures; environmental violation, legal penalty, and law enforcement disclosures; environmental disaster disclosures; and, multifaceted disclosures. I review these studies from three distinct perspectives: empirical results, theoretical frameworks, and methodological approaches. The empirical results in the extant literature unanimously support negative stock price reactions to all environmental pollution events, irrespective of the research sample. My review of the frameworks illustrates how researchers mobilize diverse rationales to explain their similar results. I also review the rigor of the methods based on seven established criteria. I then synthesize my three distinct review perspectives. In total, I identify 13 limitations in this area. I close by deriving concise recommendations to support future research and help to advance insights into this field.

Keywords: Environmental pollution event; Event study; Systematic literature review, Research agenda

Introduction

Organizational stakeholders have a growing interest in the environmental performance of firms (Bhattacharyya & Cummings, 2015) and, increasingly, this interest translates into stakeholder environmental pressure (Kassinis & Vafeas, 2006). Research provides plentiful examples: employees pressure their firms to become greener (Sarkis et al., 2010); customers increasingly base their buying decisions on environmental footprints (Huang et al., 2016); governments enforce regulations to enhance firm environmental performance (Chang et al., 2015); debtholders might increase the costs of financing due to risky environmental activities (Eichholtz et al., 2019); and, finally, shareholders sell a firm's stock as a result of disappointing environmental performance (Endrikat, 2016; Flammer, 2013). Therefore, it is not surprising that academia is intensely concerned with the question of how environmental performance is related to financial performance (Filbeck & Gorman, 2004; Horváthová, 2010; Nakao et al., 2007; Stanwick & Stanwick, 1998).

Within the broad field of financial analyses of environmental performance, analyses of investor reactions to environmental pollution events (i.e., event studies) have emerged as a salient research method. A rich body of literature deals with the question of how environmental pollution events affect the stock returns of both the respective firms and their affiliates but, as yet, only Endrikat (2016) has offered a meta-analysis of empirical results to synthesize the findings. Thus, potential insights remain undiscovered – such as a categorization of the research field and its empirical findings, a juxtaposition of explanatory theories for these results, and an assessment of the applied methods. To address these research gaps, I pose the following research questions:

RQ1: How can the field of stock-based event studies of environmental pollution events be systemized?

RQ2: What are the syntheses and limitations of this field in terms of the empirical findings, theories, and methodological specifications?

RQ3: What should be the resulting research agenda on environmental pollution events?

Therefore, I perform a systematic literature review (SLR) on stock-based event studies of environmental pollution events. This review includes a systemization of the field, attributes prevailing studies to the defined subfields, and outlines central aspects of research samples and findings, theoretical frameworks, and methodological characteristics. Based on these three distinct reviews of 38 event studies from 1990–2020 examining environmental pollution events, I provide four research recommendations that help to shed light on questions that are unaddressed so far, two recommendations to enhance the theoretical frameworks in future research, and seven recommendations to improve methodological validity.

Besides advancing future stock-based event studies of environmental pollution events, this SLR also maps the research landscape in this field, allowing researchers to quickly identify the relevant literature for their analyses and to have a comprehensive overview of the current state-of-the-art in the extant literature to derive apparent research gaps.

The remainder of this paper is organized as follows: Section 2 outlines the SLR methodology and describes the literature data, Section 3 illustrates the empirical findings of the extant literature, Section 4 discusses their theoretical frameworks, Section 5 reviews the methods employed, and Section 6 provides the implications of this review and concludes the paper.

SLR methodology and data description

This SLR generally follows the principles as recommended in the PRISMA statement (Liberati et al., 2009).

Studies are eligible for this review if they examined the stock price reaction to environmental pollution events. Thereby, the term "environmental pollution events" comprises all types of negative environmental events such as pollution disclosures, violations, and disasters. Accordingly, all studies examining pollution announcements, environmental regulation violations (e.g., fraud), disasters, etc. are eligible for this review.

In the search process, I relied on the "Scopus", "Web of Science", and "Google Scholar" databases and employed the following keywords to perform the literature research: "event study" OR "stock price" OR "stock market" OR "capital market" AND "environment* damage" OR "pollution" OR "environment* violation" OR "environment* disaster" OR "spill*" OR "waste". Moreover, as a starting point, I employed the meta-analysis by Endrikat (2016), which already provides a solid basis for the relevant literature from 1990–2013. Then, I assessed the literature regarding relevant citations based on the "ancestry approach" to identify further relevant resources (Atkinson et al., 2015). In total, this research process yielded 40 studies that cover a period from 1990–2020. Then, I carefully screened all studies in terms of the contents and eligibility prior to including them in the review.

I did not impose any restrictions regarding the academic disciplines of respective journal outlets in order to keep the scope as broad as possible but did set other limitations. I do not consider studies that did not undergo peer review (i.e., working papers). Furthermore, I only include studies that have been published in journals listed in the 2018 Academic Journal Guide (AJG) ranking by the Chartered Association of Business Schools to ensure a minimum of quality in terms of academic rigor (Chartered Association of Business Schools, 2018). Finally,

I only include studies that employed event study methodology (MacKinlay, 1997) to examine the stock price reactions to environmental pollution events. These restrictions reduced the literature sample by two for a total sample of 38 studies (Jones & Rubin, 2001; Rao, 1996). Table 1 provides the authors, publication year, and journal outlets of the underlying studies.

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Similar to Khatib et al. (2020), I review the extant literature in terms of their empirical findings, theoretical frameworks, and methodology. Before that, I systemize the field by attributing the extant literature to categories (subfields) based on the topics covered in respective studies.

Review of empirical findings

Systemization of the field

As outlined in the previous section, 38 studies were identified as relevant to this review. These studies examine various environmental pollution events in terms of their stock price implications using event study methodology. Therefore, a useful systemization should cluster the studies based on their research subjects (i.e., underlying events). Concerning RQ1, the extant literature can be clustered into four salient research subfields. Research in this field relies on public pollution disclosures, environmental regulation violation (incl. legal penalties and law enforcement) announcements, and environmental disaster announcements. Some studies also include events from more than one of these subfields, constituting the fourth category: multifaceted disclosures. Figure 1 illustrates this interrelation and the number of studies relating to each subfield. All disclosures were sourced from governmental institutions or public news media.

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The attribution of the studies to the subfields reveals that environmental violation and disaster studies dominate the field. This is not surprising as these events receive great mass media attention and are of high relevance for publicity (Pantti, 2019). In the upcoming sections, I review the empirical findings of each research subfield.

Pollution disclosures

In this review, pollution disclosures refer to any disclosure that indicates that a firm has engaged in any form of substantial environmental pollution but does not contain information on any legal consequences. Six studies built on pollution disclosures to examine the stock price reaction to environmental misconduct. Table 2 illustrates the studies in this research subfield as well as their research samples.

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In this research subfield, the Toxic Release Inventory (TRI) collated and published by the US Environmental Protection Agency (EPA) has received major academic interest. Hamilton (1995) investigated 436 TRI releases published by the US EPA for the first time in 1989 (for toxic releases that happened in 1987) and found statistically significant, negative abnormal returns (ARs) for firms that were mentioned in the TRI. These negative ARs relate to average stock losses of $4.1 million. Konar and Cohen (1997) also looked at the TRI, including 130 subsequent releases from 1988–1992, and investigated how inclusion in the TRI release influences firm behavior. They found that being included in a TRI announcement is associated with significant stock losses and the higher the TRI ranking (i.e., larger toxic releases), the worse the losses. They also found that firms who had experienced stock losses due to being included in a TRI release were more prone to reduce their emissions in the subsequent years than their industry peers, presumably in an attempt to avoid further stock market penalties. Looking specifically at TRI announcements in the chemical industry, Khanna et al. (1998) examined 94 TRI releases from 1990–1994 and, in line with Hamilton (1995) and Konar and

Cohen (1997), they report significant, negative abnormal losses for the chemical firms included. However, in contrast to Konar and Cohen (1997), they discovered that on-site toxic releases reduced substantially following the release while off-site releases increased proportionally to that reduction, causing, at best, a negligible overall reduction in toxic releases. In Europe, Cañón-de-Francia et al. (2008) examined the stock price reaction of firms whose environmental performance is included in the European Pollutant Emission Register (EPER), a regulatory instrument of the European Environment Agency (EEA). Looking at 80 facility listings relating to 28 Spanish firms, they report, just like the US-based studies, statistically significant, negative ARs for polluting firms listed in the EPER. Furthermore, similar to Konar and Cohen (1997), the worse the pollution incident indicated in the EPER, the more negative the ARs were. Finally, taking another approach to examining environmental pollution, Gupta and Goldar (2005) analyze the stock price reaction to 50 environmental ratings of Indian firms by the Centre for Science and Environment (CSE), an Indian NGO, thereby, focusing on high polluting industries (pulp and paper, auto, and chlor alkali). They conclude that firms that have bad environmental performance due to high pollution, expressed in a bad rating by the CSE, experience substantially negative ARs of up to 30% upon the revelation of the rating.

Thus, the review of the pollution disclosure literature illustrates that there is consensus about the stock price implications of pollution disclosures and that a firm has to expect to be penalized by investors for polluting the environment.

Environmental violation, legal penalty, and law enforcement disclosures

As displayed in Figure 2, the research subfield of environmental violation, legal penalty, and law enforcement disclosures (19 studies) is the largest in this review. This subfield includes studies that investigate stock price reactions to announcements of environmental regulation violations and the corresponding legal consequences. Table 2 illustrates the research samples of the respective studies.

Lanoie et al. (1998) looked at the 'List of Polluters' that has been published every six months since 1990 by the Ministry of Environment of British Columbia (Canada). It lists firms that currently "do not comply" with existing environmental regulations or are "of concern" because of environmental performance that comes close to a violation. Scrutinizing 19 firms on five lists from 1990–1992, they report no significant abnormal losses for firms appearing once. However, when a firm appeared more than once in the lists, a significant negative reaction was observed. Applying a very similar course of investigation, Dasgupta et al. (2006) investigated South Korea's Ministry of the Environment monthly violation report from 1993–2000 comprising violations of emissions standards and failures to operate pollution abatement equipment properly. They conclude that investors in South Korea react strongly to these violation report disclosures which leads to significant abnormal stock losses for violating firms. Providing evidence for the Chinese setting, Xu et al. (2012) considered 57 environmental regulation violation announcements by China's Ministry of Environmental Protection (CMEP) in 2010. They report significant abnormal losses for violating firms, albeit on a lower level than in other countries. In a subsequent study, Xu et al. (2016) emphasize the role of media coverage in determining the ARs of 173 firms to environmental violations disclosed by CMEP from 2007–2011: they find that firms whose violations received greater media attention suffered larger financial losses than firms with lesser media coverage. More concerned with the intra-industry spillover effect of environmental violations in China, Zou et al. (2015) examine 59 environmental violation disclosures by CMEP from 2007–2011, widening their scrutiny to firms in the same industry (competitors). Their intra-industry analysis revealed that not only is the violating firm punished by the stock market but, because they share the same environmental risks due to similar technical conditions and production outputs, their competitors in the same industry are, too. This effect is magnified when the competitor has similar cash flow characteristics and ownership structures (such as state-ownership).

Using public news instead of governmental disclosures as their information source, Karpoff et al. (2005) examine a large sample of 478 environmental violations from 1980–2000 in the US, including various regulatory violations. The violating firm experiences significant, negative ARs as a result of the initial press announcement, irrespective of whether the violation event represents an allegation, if charges were filed, or whether a settlement was reached. Lundgren and Olsson (2010) provide further evidence in that regard from an international sample of 142 firms alleged to have violated international environmental laws from 2003–2006 as reported by Global Ethical Standards (GES) Investment Services, an investment service of Sustainalytics, an ESG rating firm. They report significant negative ARs, but only for European firms. They argue that there are significant differences in the regulatory environments between Europe and the US, with US regulations being much more stringent. Therefore, as environmental violations frequently cause legislators to impose new regulations that potentially affect firm profitability, investors in Europe are more concerned about these effects than in the US.

Another research stream in this subfield is more concerned with the legal consequences of environmental violations. Muoghalu et al. (1990) were the first in my literature sample to examine the effect of hazardous waste lawsuits on the stock price. They employ 128 lawsuits in the US for toxic or hazardous materials mismanagement from 1977–1986, which violated the Resource Conservation and Recovery Act and the Comprehensive Environmental Response Compensation and Liability Act. The analysis revealed major significant negative ARs for firms at the filing of the lawsuit, providing evidence that stock markets' reaction to these lawsuits might well deter firms from engaging in hazardous waste mismanagement. This finding finds comprehensive support in a complementary study by Little et al. (1995). Laplante and Lanoie (1994) examined 47 environmental events referring to violations, legal actions, and suit settlements from 1982–1991 for the Canadian setting. Unlike Muoghalu et al. (1990), they

report significant negative ARs only for the suit settlements and not for the filings. They argue that environmental law enforcement in Canada is less strict than in the US, making lawsuit announcements only value-relevant in cases of settlements including penalty fines. To derive further evidence on the effects of penalty fines as the legal consequence, Lorraine et al. (2004) examined 23 penalty fines in the UK from 1995–2000 retrieved from public news media and the UK Environment Agency "Hall of Shame" press releases and studied their determinants. They conclude that penalty fine announcements come with market losses that are similar to the amount of the fines. Other potentially explanatory factors such as environmental performance news or industry membership did not affect the size of the market penalty.

Some researchers have considered inspections by governmental environment authorities as the underlying event. Investigating the stock price reaction to US EPA judicial actions, Badrinath and Bolster (1996) analyze a comprehensive sample of 4,044 judicial actions from 1976–1991. They provide evidence that firms targeted by US EPA judicial actions experience significant negative ARs which are pronounced for citations under the Clean Air Act, repeated violations, and more recent EPA actions. In contrast to Lorraine et al. (2004), they argue that these market penalties are unrelated to the size of the penalty fine. Deepening the analysis of US EPA actions in terms of their stock price implications, Bosch et al. (1998) investigate 171 EPA pollution control enforcement activities and also conclude that firms targeted by an EPA law enforcement activity suffer significant stock losses. Tian et al. (2019) shift the focus to heavy-polluting firms and the Chinese setting and analyze 270 Central Government Environmental Inspections against heavy-polluting firms and their stock price implications. They found that while firms did experience significant abnormal stock losses as a result of the inspection, some are, however, buffered by strong political connections as firms with strong ties to the government can expect to be inspected less strictly than others. This buffering effect is even more pronounced in cases of state-owned enterprises. This result finds compelling

support from Zeng et al. (2021) who investigate the implementation of the Central Environmental Protection Inspection and analyze its effect on the stock returns of 155 Chinese A-listed firms. In general, the implementation of the new environmental inspection exerted pressure on the firms reviewed, leading to overall negative ARs. Thus, heavy-polluting, small, and firms with weak political ties are more heavily affected by the implementation event as they are more sensitive to potential inspections.

The final research stream in this subfield accounts for an industry that has received particular research interest in terms of environmental violations. Due to its crucial impact on the environment and its economic importance (Liu et al., 2015), the automotive industry is critically assessed by investors in terms of its environmental performance. Wood et al. (2018) examine 41 "failure to meet environmental commitments" announcements in an international sample of automotive firms. These failures were often disclosed by automotive firms only when confronted by environmental authorities, when recalls were necessary due to excess emissions, or when the eco-efficiency of particular vehicles was overestimated. For these failure announcements, they report significant negative average stock losses for firms, which became more pronounced after the emergence of Dieselgate, Volkswagen's (VW) comprehensive diesel emissions fraud, as trust in the automotive industry was deeply shaken by this event. Specifically examining Dieselgate and the effect of the US EPA's filing of a notice of violation against VW on 18 September 2015, Fracarolli Nunes and Lee Park (2016) consider 33 US-based automotive firms from different levels of the supply chain (suppliers and manufacturers) and conclude that both suppliers and manufacturers that rely on diesel fuel technology experienced heavy negative stock returns as a result of this event. Also relying on the EPA disclosure, Jacobs and Singhal (2020) explored the impact of Dieselgate on a variety of stakeholders such as other manufacturers, suppliers (tier-1 and tier-2), and customers (wholesalers, retailers, and rental agencies). For an international sample of firms, they report

significant mean stock losses for both tier-1 suppliers and tier-2 suppliers of engine components and emissions systems, with European suppliers and suppliers with a large dependence on VW suffering the most. European customers of VW, as well as other European car manufacturers, were also heavily targeted by investors and experienced substantial stock losses. Focusing more on the same level of the supply chain and extending Dieselgate to 10 subsequent events (from the EPA disclosure in 2015 to Germany's federal supreme court legally declaring VW's cheating software to be a material defect in 2019), Bouzzine and Lueg (2020) examine three German car manufacturers in terms of how the Dieselgate events affected their stock returns. They report that while VW suffered heavy financial damage only upon the initial EPA disclosure, the other German car manufacturers suffered repeated reactions to multiple event windows as more information came into the public domain: investors appeared to have had difficulty in initially grasping the full extent of Dieselgate and the corresponding risk that other car manufacturers were involved in the fraud.

To conclude this subfield, stock prices of violating firms react negatively to the announcements of the violation, their legal consequences (lawsuits, penalty fines), and inspections. Furthermore, the fallout of these events potentially spills over to related firms and contaminates their stock returns. These findings particularly persist for the automotive industry and other heavy-polluting industries that have received great research interest due to their crucial impact and frequent violations. Therefore, the review of this research subfield comprehensively illustrates that firms have to expect punishment by the stock market (in addition to any legal penalties) for violating environmental regulations that may cost potentially billions in market capitalization (Bouzzine & Lueg, 2020).

Environmental disaster disclosures

In contrast to the previous research subfield, this research subfield is concerned with studies that examine environmental disasters as a consequence of corporate accidents or natural catastrophes and does not include firm discretion regarding the decision to pollute the environment. Accordingly, the research interest in this subfield lies in major accidental leakage incidents leading to severe environmental pollution. Once again, research samples are illustrated in Table 2.

Blacconiere and Patten (1994) examine Union Carbide's chemical leak in Bhopal, India in 1984 which led to 4,000 deaths and 200,000 injuries, and the wider market reaction to 42 other chemical firms from various countries. Their study provides evidence for an intra-industry spillover effect expressed in negative ARs due to expectable higher regulatory costs. Deepening the knowledge on chemical leakages, Capelle-Blancard and Laguna (2010) consider 64 explosions in an international sample of chemical plants and refineries from 1990–2005, differentiating between those that resulted in toxic releases and casualties in the form of injuries and/or death and those that did not. On average, the losses are more pronounced when the explosions cause pollution and/or casualties are involved.

Another disaster that has received substantial research interest is Fukushima and the corresponding nuclear waste spill. On 11 March 2011, following an earthquake and tsunami, three of the six nuclear reactors at the Fukushima Daiichi nuclear power station owned by Tokyo Electric Power Co. (TEPCO) failed due to a nuclear meltdown, overheating, and several explosions that led to radiation leakages (Kawashima & Takeda, 2012; Lopatta & Kaspereit, 2014; Nakajima et al., 2019). Examining the stock price implications of the Fukushima nuclear accident announcement, Basse Mama and Bassen (2013) analyze 111 European electric utility firms in terms of the intra-industry information transfer from TEPCO to other firms and separate these into conventional and alternative energy firms. They conclude that, other than TEPCO,

European conventional energy utility firms were hit the hardest and suffered significant negative ARs. However, alternative energy utility firms were spared most of the financial damage. Applying a similar analysis to the Japanese setting, Kawashima and Takeda (2012) consider 11 Japanese electric power utilities and also conclude significant financial losses to these firms. These are more pronounced when the firm has its own nuclear power plants. Interestingly, just like Basse Mama and Bassen (2013), they report an increase in overall risk associated with firms operating nuclear power plants following the Fukushima disaster. These findings receive comprehensive support from Lopatta and Kaspereit (2014) who analyze 52 firms operating nuclear power plants in 14 countries and find that the extent of the negative impact of the Fukushima accident on the stock returns of the firms largely depends on the number of nuclear power plants a firm operates.

Another stream relating to this subfield refers to studies examining the effect of various oil spill incidents. Herbst et al. (1996) studied the stock market response to the Exxon Valdez disaster on 24 March 1989 when the oil tanker grounded on a submerged reef leading to 250,000 barrels of crude oil leaking into the sea. They report substantial stock losses for Exxon following the spill announcement. Surprisingly, other large oil firms did not experience any significant negative ARs connected to this event and the market was only concerned with any unanticipated losses that Exxon might occur in the future. Sabet et al. (2012) examine the Deepwater Horizon oil platform disaster: on 20 April 2010, the BP Deepwater Horizon oil platform located in the Gulf of Mexico caught fire following an explosion and sank two days later. This resulted in the largest maritime oil spill ever recorded in the US as it took almost four months to stop the leak. Consequently, the US Department of Interior imposed two moratoriums on deepwater drilling in the Gulf of Mexico that lasted until 12 October 2010. Analyzing 214 US-based oil and gas firms, grouping them into BP, BP subcontractors, moratorium firms, and other firms, and considering eight consecutive events related to oil spills, they report significant negative ARs

for BP and its four main subcontractors for the majority of events. The same applied to the moratorium firms to a lesser extent. Only the group of "other" firms was not affected by the incident. Deepening the analysis of the spillover effect from BP to other firms, Humphrey et al. (2016) examine how seven Deepwater Horizon disaster-related events affected the stock returns of 45 oil and gas firms, of which 7 related to major oil and gas firms, 11 to independent oil and gas firms, 12 to oil and gas drilling and exploration firms, 7 to oil and gas equipment and services firms, 4 to oil and gas pipeline firms, and 4 to oil and gas refining firms. Generally, they conclude overall significant stock losses for oil and gas firms which, however, varied across the different groups. Firms not involved in the spill and without operations in the Gulf of Mexico generally escaped punishment by investors. Scholtens and Oueghlissi (2020) take another perspective on oil spills and examine how fishery firms' stock returns are affected by policy and disaster events, examining 46 events including earthquakes, tsunamis, volcanic eruptions, and oil spills. Their findings show that disasters do represent shocks to fishery firms while policy events (e.g., restrictions on fishing in certain areas) rather have marginal significance. From their sample of disasters, they found that earthquakes have the largest impact and damage stock returns more intensely than oil spills due to their wider geographic effects compared to more local oil spills. Still, oil spills are of significant value relevance to fishery firms. Opposing these findings, Carpentier and Suret (2015) do not find any significant ARs for environmental accidents in their long-term event study.

Aside from the findings by Carpentier and Suret (2015), the vast majority of the literature on stock price implications of environmental disasters finds substantially negative price reactions to firms (accidentally) causing the disasters and firms affected by their consequences.

Multifaceted disclosures

This subfield comprises studies that cannot be attributed to the prior subfields as they examine multifaceted samples of environmentally harmful events. These are again illustrated in Table 2.

Klassen and McLaughlin (1996) examine various negative environmental events and their stock price implications. To operationalize negative environmental performance, they consider 22 environmental crisis events consisting of spills, contaminations, explosions, leakages, etc. and report negative ARs for all of them. Focusing on pollution in developing countries (Argentina, Chile, Mexico, and the Philippines), Dasgupta et al. (2001) consider 87 negative environmental events comprising spills, complaints by the population, governmental warnings, etc. and conclude that capital markets essentially function as external corporate governance mechanisms for environmental compliance as they react negatively to these environmental pollution events. Flammer (2013) applies a very similar analysis for the US, examining the stock price reaction to 156 eco-harmful events (pollution, contamination, radiation, spills, hazardous waste, etc.), and reaches the same finding. She also acknowledges that stock price gains associated with eco-friendly events decline over time while negative returns for eco-harmful events may yet increase due to increasing environmental consciousness in society. Finally, Jin et al. (2020) consider 65 environmentally irresponsible events (various types) from 2014–2018 disclosed by China's Ministry of Ecological and Environmental Protection and explicitly examine heavy-polluting industries (extractive, chemical, steel, and building materials) in terms of direct and intra-industry spillover effects. They report that heavy polluters are punished by investors for environmentally irresponsible events with negative ARs being influenced by ownership structure and industry, and their analysis also revealed a substantial intra-industry spillover effect from the irresponsible to industry peers.

Accordingly, the multifaceted studies principally confirm the findings of the three previous research subfields.

To conclude the extensive review of the extant literature, I find that the vast majority of studies unsurprisingly report negative, statistically significant ARs in response to environmental pollution events. The review also comprehensively illustrates the different means by which researchers sample negative environmental performance and that, despite having numerous types of environmental pollution samples, these events can generally be attributed to my predefined subfields: *pollution disclosures; environmental violation, legal penalties, and law enforcement disclosures; environmental disaster disclosures;* and, *multifaceted disclosures*. In Section 6.2, I will recap these sections to derive recommendations for researchers in this field.

Review of theoretical frameworks

In this section, I will review the theoretical frameworks and separate studies in terms of the effects they measure: *direct* and *spillover effects*. My review revealed that 24 studies limit their examination to the direct effect whereas 14 explicitly measure a spillover effect (Table 3). Table 3 also illustrates the underlying theoretical frameworks of the extant literature. It reveals that theoretical frameworks are more fragmented than uniform, that studies examining the spillover effect are concentrated on the violation and disaster subfields, and that many (20) do not explicitly employ a theoretical framework to derive the underlying research hypotheses.

--- PLEASE INSERT TABLE 3 ABOUT HERE ---

Theoretical perspectives on the direct effect

The direct effect describes the effect of an environmental pollution event on the stock returns of the firm responsible for the event. Examining the direct effects of an environmental pollution event, many researchers employ the *efficient market hypothesis*, arguing that efficient stock markets immediately react to new, publicly available information (Fama et al., 1969). In that sense, the disclosure of an environmental pollution event is associated with an information shock to investors which triggers a corresponding negative reaction. Pollution disclosures (e.g., through TRIs), as such, hold new information on future cash flow as these potentially imply unexpected investments in pollution abatement, waste treatment costs, liabilities, worsened competitive positions, and diminished overall profitability (Cañón-de-Francia et al., 2008; Gupta & Goldar, 2005; Khanna et al., 1998; Konar & Cohen, 1997). Similar theoretical frameworks apply to violation disclosures (Lundgren & Olsson, 2010), disaster disclosures (Carpentier & Suret, 2015), and multifaceted disclosures (Klassen & McLaughlin, 1996). Figure 2 illustrates this predominant framework.

--- PLEASE INSERT FIGURE 2 ABOUT HERE ---

While the information efficiency theoretical lens is undisputedly able to explain the dynamics involved when environmental pollution events are disclosed, some researchers enhance this view by adding other theoretical frameworks. Based on an information economic approach, Zeng et al. (2021) underpin their hypotheses using *environmental regulation theory* to argue that the implementation of the Central Environmental Protection Inspection comes with direct compliance costs and indirect pressure for firms, leading investors to sell stocks. Providing further evidence on compliance, Laplante and Lanoie (1994) argue from an *optimal compliance theoretical lens*, stating that firms have incentives to *not* comply with environmental regulations until they reach the point where potential costs and losses exceed the savings from omitting investments in pollution abatement equipment. Also extending the market efficiency view,

Flammer (2013) employs *stakeholder theory* (Freeman, 2010; Jones, 1995) to explain the impact a firm has on its environment, as well as the resource-based view (Porter & van der Linde, 1995) to explain why firms lose their competitive edge by polluting the environment in her hypothesis development.

Overall, the theoretical review of the direct effects revealed that only a few studies employ a theoretical framework and that the efficient market hypothesis is dominant in this field. However, some researchers enhance the pure market efficiency perspective by arguing from additional theoretical perspectives.

Theoretical perspectives on the spillover effect

The spillover effect describes the effect of an environmental pollution event for firms where the event has been caused by another firm. Fourteen of the studies reviewed here are concerned with the spillover effect and are clustered in the violation and disaster subfield. Table 3 displays the theories employed in spillover studies.

Just like for the direct effect studies, the environmental pollution event represents an unexpected information disclosure that is processed by investors and reacted upon through the means of *market efficiency*. However, in contrast to the direct effect studies, this disclosure contains implicit information about associated firms as well as the firm responsible for the event. Figure 3 illustrates this framework.

--- PLEASE INSERT FIGURE 3 ABOUT HERE ---

Disaster studies tend to explain the spillover effect by arguing that markets can anticipate the far-reaching consequences that also affect non-responsible firms. These relate to costs for tightening regulation, declining sales due to industry image problems, and necessary investments to prevent the re-occurrence of such disasters (Basse Mama & Bassen, 2013; Blacconiere & Patten, 1994); Fracarolli Nunes and Lee Park (2016) make a similar argument.

Jin et al. (2020) enrich the information efficiency approach in determining the spillover effect by adding elements of *legitimacy theory* and arguing that industry peers' legitimacy is severely threatened by the disclosure of an environmental pollution event, creating the potential for a spillover effect.

More recently, Ouyang et al. (2020) comprehensively analyzed why environmental misconduct spills over to innocent firms. They conclude that stakeholders tend to categorize firms and that inter-firm similarity is a major driver for the spillover effect. Thereafter, stakeholders punish innocent firms financially as they lose trust in the industry as a whole due to one firm's environmental misconduct. This theoretical construct has been exemplified and confirmed by Zou et al. (2015), Xu et al. (2016), and Bouzzine and Lueg (2020). Drawing on *signaling theory* (Connelly et al., 2011; Spence, 1973), they argue that business model similarity (Bouzzine & Lueg, 2020) and industry belonging (Xu et al., 2016; Zou et al., 2015) are the foundations of a spillover effect. Accordingly, once a firm engages in environmental misconduct by violating environmental regulations, a spillover effect on other firms can be expected if firms are highly interrelated.

Again, this review revealed that information efficiency plays an important role in determining not only the direct effects but also the spillover effect. However, more recent studies tend to enhance this view by adding elements from other theories such as signaling and legitimacy theory. Thereby, it is notable that the inclusion of signaling and the role of firm interwovenness increasingly develops the salient framework explaining a spillover effect. On the other hand, many studies do not employ a theoretical framework for developing hypotheses.

This theoretical review will serve as the basis for section 6.3 in which the limitations are highlighted and recommendations are derived.

Methodological review

In this section, I review the details of the event study methods applied by the researchers. Therefore, I follow the methodological framework proposed by MacKinlay (1997) based on daily stock returns (Brown & Warner, 1980; 1985) and review these elements, respectively. Thereafter, the event windows (the time ranges during which the ARs are measured), have to be defined, expected stock returns estimated, ARs calculated, and statistical significance tested. In detail, I am concerned with the estimation models, estimation windows (time ranges during which the normal returns are estimated), event windows, test statistics, treatment of confounding events, robustness checks, cross-sectional analyses of the cumulative abnormal returns (CARs), and the monetization of the CARs. Table 4 illustrates some of these elements of the studies.

--- PLEASE INSERT TABLE 4 ABOUT HERE ---

First, concerning the *estimation model*, I acknowledge that the vast majority of studies employ the market model to estimate normal returns. I find that only a few either add multifactor models such as the Fama and French (1992) three-factor model to the market model (Jin et al., 2020; Lundgren & Olsson, 2010) or the mean-adjusted returns model (Badrinath & Bolster, 1996). Only one study employs Carhart's (1997) four-factor model (Lopatta & Kaspereit, 2014); another considers both the Fama and French (1992) three-factor and the Carhart (1997) four-factor model (Carpentier & Suret, 2015). Thus, the market model is by far the most dominant estimation model in the field. Accordingly, it is also relevant to review the underlying *markets (benchmarks)* in terms of their size to derive representative market returns for the estimation. I find that while prevailing event studies generally employ large benchmarks to calculate market returns, many do not explicitly state which stock market index was employed for the calculation (Badrinath & Bolster, 1996; Basse Mama & Bassen, 2013; Capelle-Blancard & Laguna, 2010; Carpentier & Suret, 2015; Klassen & McLaughlin, 1996; Konar & Cohen, 1997; Lanoie et al.,

1998; Lopatta & Kaspereit, 2014; Muoghalu et al., 1990; Tian et al., 2019; Xu et al., 2012). Regarding the *estimation windows*, as displayed in Table 4, I see a great variety of pre-event return periods employed to estimate the expected returns. Furthermore, although most of the estimation windows are precisely defined regarding their lower bound (start day) and upper bound (end day), some are rather rudimentarily described: for example, 52 weeks (Badrinath & Bolster, 1996), 210 days (Laplante & Lanoie, 1994), and two years (Blacconiere & Patten, 1994). Thus, lower and upper bounds vary substantially among studies and range between up to two years (Blacconiere & Patten, 1994) and 88 days (Lundgren & Olsson, 2010) for the lower bound and between up to 120 days (Lanoie et al., 1998) and one day (Fracarolli Nunes & Lee Park, 2016; Kawashima & Takeda, 2012; Lundgren & Olsson, 2010) for the upper bound.

Second, I consider the number of *event windows* in this review as it is important to determine whether a variation in event windows is included. I find that 17 studies include multiple event windows in determining the CARs and 21 do not.

Third, for the *test statistics*, I review whether nonparametric test statistics are employed to control for the potential of violating the underlying normality assumption of parametric tests, and whether test statistics are employed that are robust against event-induced variance and cross-sectional correlation (Boehmer et al., 1991; Kolari & Pynnönen, 2010). First, I find that only five studies consider nonparametric tests in their investigation. These include the Wilcoxon (1945) signed-rank test (Karpoff et al., 2005; Scholtens & Oueghlissi, 2020; Tian et al., 2019), the Cowan (1992) generalized sign test (Lundgren & Olsson, 2010), and the Kolari and Pynnönen (2011) generalized rank test (Bouzzine & Lueg, 2020). Second, I find that only three studies consider robust test statistics as proposed by Boehmer et al. (1991) and further developed by Kolari and Pynnönen (2010) (Bouzzine & Lueg, 2020; Klassen & McLaughlin, 1996; Lundgren & Olsson, 2010) and that the t-test is the most common test statistic in the field.

My fourth point refers to the crucial issue of *confounding events*, events that take place at the same time as the event of interest (in the same event window) and generate their own reactions but, because they occur at the same time, may be mistaken for reactions to the event of interest and thus bias the conclusions (McWilliams & Siegel, 1997). Therefore, I review how the extant literature deals with confounding events. First, I acknowledge that only 16 out of the 38 studies explicitly address confounding events. This is done by dropping observations that are potentially influenced by a confounding event (Basse Mama & Bassen, 2013; Blacconiere & Patten, 1994; Dasgupta et al., 2006; Hamilton, 1995; Jacobs & Singhal, 2020; Konar & Cohen, 1997; Lanoie et al., 1998; Wood et al., 2018; Zou et al., 2015), leaving respective firms or events out of the examination (Bouzzine & Lueg, 2020; Flammer, 2013; Khanna et al., 1998; Lanoie et al., 1998), calculating average CARs for multiple firms for different points in time (Badrinath & Bolster, 1996), conducting robustness checks (Jacobs & Singhal, 2020; Lopatta & Kaspereit, 2014), and keeping the event window fairly short (Flammer, 2013).

Fifth, as previously noted, I review the use of *robustness checks*. Robustness checks serve the sole purpose of checking the sensitivity of the main findings by changing the parameters of the main model to see whether it is robust against these variations (Lu & White, 2014). I find that 18 studies consider robustness checks and 18 do not. Robustness checks are performed by replacing the initial estimation procedure with another to see if the findings still hold (Flammer, 2013; Gupta & Goldar, 2005; Jin et al., 2020; Little et al., 1995; Lopatta & Kaspereit, 2014; Lundgren & Olsson, 2010; Zeng et al., 2021), including additional event windows (Flammer, 2013; Fracarolli Nunes & Lee Park, 2016), changing the parameters of the estimation window (Humphrey et al., 2016; Zeng et al., 2021), performing analyses excluding confounding events (Flammer, 2013; Jacobs & Singhal, 2020; Lopatta & Kaspereit, 2014), considering alternative test statistics (Carpentier & Suret, 2015; Jacobs & Singhal, 2020; Tian et al., 2019), excluding dominant industries (Little et al., 1995; Muoghalu et al., 1990), excluding dominant cross-

sections (Lopatta & Kaspereit, 2014), excluding dominant events (Flammer, 2013), running estimations with alternative benchmarks (Carpentier & Suret, 2015; Muoghalu et al., 1990), measuring correlations to verify the findings of the main findings (Tian et al., 2019), replacing key variables (Basse Mama & Bassen, 2013; Sabet et al., 2012; Zou et al., 2015), running cross-sectional analyses to verify the main findings (Humphrey et al., 2016), analyzing abnormal trading volumes to enhance the findings for ARs (Lopatta & Kaspereit, 2014), and measuring cross-sectional correlations (Flammer, 2013). Thus, I conclude that robustness checks performed in this field are very heterogeneous and that researchers use different parameters to include variation in their models.

Within the review of robustness checks, *cross-sectional analyses of the CARs* were mentioned as one method of verifying the findings of the main model. Despite this role, cross-sectional analyses are regularly used to analyze the determinants of the CARs such as firm-specific characteristics (Jain, 1982), and to test further hypotheses. I consider this as my sixth point. My review revealed that 18 studies contain cross-sectional analyses of the CARs and 20 do not. I again find heterogeneity regarding the use of cross-sectional analyses and that study-specific explanatory variables dominate. Researchers employ pollution levels (Cañón-de-Francia et al., 2008; Zeng et al., 2021), media coverage (Hamilton, 1995; Xu et al., 2012), level of penalty fines (Karpoff et al., 2005; Lorraine et al., 2004), political connections (Tian et al., 2019; Zeng et al., 2021), ownership structure (Xu et al., 2012; Zou et al., 2015), and study-specific determinants such as the environmental sensitivity of the industry (Zou et al., 2015), supply chain level (Zou et al., 2015), location of hazardous wastes (Hamilton, 1995), product recalls (Wood et al., 2018), style and origin of the pollution event (Xu et al., 2012), revenues from chemical operations (Blacconiere & Patten, 1994), revenue dependence on a violating firm (Jacobs & Singhal, 2020), environmental disclosures in annual reporting (Blacconiere & Patten, 1994), fatalities and injuries (Capelle-Blancard & Laguna, 2010), toxic releases

(Capelle-Blancard & Laguna, 2010), number of previous accidents (Capelle-Blancard & Laguna, 2010), involvement in the accident (Capelle-Blancard & Laguna, 2010), commitment to nuclear power (Lopatta & Kaspereit, 2014), and time trends (Flammer, 2013). Various firm and industry characteristics are also included as control variables.

Finally, as my seventh point, I include the *monetization of CARs* in this review. This relates to calculating abnormal returns in absolute terms to quantify losses in monetary units. Therefore, the CARs are multiplied by firm market capitalizations whereas researchers apply the market capitalization of the period before the event (Fracarolli Nunes & Lee Park, 2016; Jacobs & Singhal, 2020; Klassen & McLaughlin, 1996) or the event date (Bouzzine & Lueg, 2020). Thereby, five of the nine studies that monetize the CARs do not state the basis of the market capitalization employed to calculate the monetary losses (Capelle-Blancard & Laguna, 2010; Hamilton, 1995; Karpoff et al., 2005; Khanna et al., 1998; Lanoie et al., 1998).

To sum up this methodological review, I have identified seven relevant items in event studies and reviewed how these are realized in the extant literature. In general, I find broad heterogeneity in these items despite the estimation models and test statistics. This methodological review serves as the basis for deriving limitations and recommendations in section 6.3.

Discussion

Research limitations and recommendations

In this section, I point out four research gaps that should be addressed by future research.

First, I recommend widening the scope of subjects of examinations and considering novel perspectives in stock-based examinations. The systemization of the field revealed that the extant literature is limited to four subfields of events: pollution disclosures, violations disasters, and multifaceted disclosures which do not take into account the recent societal development towards

environmental consciousness (Weng et al., 2019) that increasingly evolves into *stakeholder environmental pressure (SEP)*, a notion with ties to stakeholder theory (Freeman, 2010). As such, stakeholder environmental pressure can be seen as stakeholders' dissatisfaction with a firm's environmental behavior (e.g., pollution levels) which makes them pressure the firm to change. Thus, this pressure might come from primary stakeholders that are crucial to firms' survival such as customers, suppliers, and governments, or secondary stakeholders that do not directly interact with the firm but are affected by their actions such as the surrounding population, NGOs, media, etc. (González-Benito & González-Benito, 2006). Accordingly, firms experience particular stakeholder environmental pressure if they are large, located in highly-populated areas, produce final goods, and operate in environmentally sensitive areas, i.e., they are generally of public interest and visible to stakeholders (González-Benito & González-Benito, 2008; Yu et al., 2017). To pressure firms into pro-environmental behavior for the sake of collective benefits such as prevention of health issues (SGuin et al., 1998) and enhancement of environmental performance (Yalabik & Fairchild, 2011), various stakeholder groups might engage in different forms of collective activism (Lubell, 2002). As yet, the extant literature is very much concerned with governmental institutions as primary stakeholders of firms' environmental performance and focuses on their disclosures regarding pollution (Cañón-de-Francia et al., 2008; Hamilton, 1995; Khanna et al., 1998; Konar & Cohen, 1997), their law enforcement announcements (Badrinath & Bolster, 1996; Karpoff et al., 2005), and inspections (Tian et al., 2019; Zeng et al., 2021) as reactions to environmental pollution events. These views ignore the fact that events can also be actively created by stakeholders: SEP theory proposes that stakeholders create and utilize events as an outlet for their long-term accumulated dissatisfaction with the behavior of firms and that a specific trigger is not needed. An example is "Fridays for Future" which affected the business model of Siemens by exerting pressure on its coal operation business, even though Siemens did not have a salient, recent event that would justify this engagement (Fridays for Future, 2020; Hegmann, 2020; Kühne, 2019; ZEIT

ONLINE, 2020). A distinct research subfield should be established that specifically considers stock price reactions to stakeholder environmental activism events.

Second, I suggest including a spillover dimension in pollution disclosure studies. The review revealed that there is evidence on the spillover effect of violation and disaster events, but not yet on pollution disclosures. Pollution disclosures of single firms might indicate a structural pollution problem in the industry as industry peers share many attributes with regard to capital intensity and energy use (Cole et al., 2005) I encourage prospective research to include a spillover dimension (and thus, closely related industry peers) in the examination to derive possible conclusions to fill this research gap.

Third, future research should account for the significant discrepancies in study coverage between different country settings. Throughout all subfields, I find that findings from several countries are underrepresented in relation to their large environmental footprints. The field is dominated by studies examining environmental pollution events in the US (15), cross-countries (9), and China (6). Also, the evidence is rather fragmented. For instance, Europe and Japan constitute only 11% of all research samples, while the US is overrepresented with 39%. I find it surprising that the European setting has not received much research interest so far: despite being known for high stakeholder orientation (Patel et al., 2016) suggesting substantial effects of environmental pollution events (Bouzzine & Lueg, 2020; Cañón-de-Francia et al., 2008), European firms have been largely neglected by academia. Accordingly, research should be focused on other country settings to widen our knowledge that currently is very much limited to the US and Chinese settings.

Fourth, future research should also be more concerned about the aftermath of environmental pollution events and their stock price reflections. As outlined by Lee and Xiao (2020), firms react differently to their environmental violations: they might simply pay the penalty fine or even engage in voluntary environmental projects as a form of restorative action.

How firms deal with their environmental violation in the aftermath eventually has substantial implications for their stock price recovery from the violation-induced losses and, therefore, deserves closer examination in future research.

Theoretical limitations and recommendations

Theories play an important role in academic papers and particularly so in management research. Theories are relevant to hypothesizing on relationships between constructs, but it should be noted that many research questions cannot be thoroughly answered by drawing solely upon one research question. In these cases, one theory is not sufficient to determine the underlying mechanisms that trigger certain outcomes and to hypothesize on relationships (Bacharach, 1989; Mayer & Sparrowe, 2013). Based on the theoretical review in section 4, I identify four limitations that should be addressed in future research.

First, I suggest that future studies should not be as phenomenon-driven, but rather rely on a theoretical framework that outlines the rationale behind why and how the stock market reacts. I critically acknowledge the most obvious point that several researchers did not consider a theoretical framework in their investigations (Table 3): in these studies, hypotheses are derived based on the underlying case although a theoretical framework is not explicitly outlined. This makes it difficult to understand the intricate mechanisms the researchers see at work (e.g., why a spillover is [not] relevant; is the new information revealed through improvements in market efficiency or due to learning?). This makes it difficult to generalize beyond the specific case (can this happen again?: and, if so, will reactions be the same?).

Second, I recommend broadening the view that market efficiency is the only mechanism in place when examining stock market reactions. My review revealed that researchers tend to rely solely on the efficient market hypothesis to derive the hypotheses of their papers. I argue that adding other theoretical perspectives to this purely information-driven approach might add value in addressing the research questions (Mayer & Sparrowe, 2013). Some researchers have

already done so and added legitimacy (Jin et al., 2020), agency (Bouzzine & Lueg, 2020), signaling (Bouzzine & Lueg, 2020; Xu et al., 2016; Zou et al., 2015), resource-based (Flammer, 2013), stakeholder (Flammer, 2013), and case-specific theoretical elements (Fracarolli Nunes & Lee Park, 2016; Laplante & Lanoie, 1994; Zeng et al., 2021) to their framework. Therewith, these researchers provide a more compelling framework that enables insightful analyses in consequence. By clinging to efficient markets as the sole underlying mechanism, researchers might miss the opportunity to consider parallel mechanisms that enable the development of alternative hypotheses. Specifically, I recommend future research consider theories on reputation and legitimacy for the direct and spillover effects, respectively:

A reputational theoretical lens on the direct effects of environmental pollution events has, thus far, been missing: firm misconduct (i.e., pollution) might be a source of substantial reputational losses (Sampath et al., 2018). Karpoff (2014) and Murphy et al. (2009) outline that investors' decision to sell stocks due to reputation losses reflects their fear of deterioration of firm performance as a consequence of customer calls for boycotts, declining sales, deterioration of credit rating, increase in firm risk, and a decrease in profitability. Accordingly, future research might also be interested in turning a reputational theoretical lens on environmental pollution events to shed light on the question of whether reputation losses might be the underlying mechanism that drives the stock losses.

For the spillover studies, a signaling-based theoretical lens as elaborated by Ouyang et al. (2020) and applied by Bouzzine and Lueg (2020), Xu et al. (2016), and Zou et al. (2015) is increasingly emerging as the salient perspective to derive the spillover effect arising from environmental pollution events. However, negative spillover effects might also be deduced by illegitimacy spillovers that spread from the polluting firm to peers. As outlined by Jonsson et al. (2009), firm misconduct frequently results in legitimacy losses for the misbehaving firm that eventually spread to other firms that exhibit similarities. This theoretical lens might also be

worth investigating further when examining spillover effects from environmental pollution events.

Methodological limitations and recommendations

First, I provide recommendations on the estimation model selection, the underlying benchmarks, and the estimation windows. Concerning the application of estimation procedures, as outlined in Table 4, the vast majority of studies employ the market model to estimate the expected returns. Despite the existence of more recent multi-factor models for estimation, even recent event studies in the field have relied on the market model (Bouzzine & Lueg, 2020; Scholtens & Oueghlissi, 2020; Zeng et al., 2021). Fama and French (1992) argue that to better account for price anomalies, researchers should consider size, leverage, book-to-market ratios, and earnings-price ratios in the estimation. They demonstrate that small stocks (in terms of market capitalization) have significantly higher average stock returns than large stocks and stocks with high book-to-market ratios (Fama & French, 1996). Based on this evidence, I argue that the three-factor model is superior in estimating expected returns to the market model and should be applied by researchers in the field within their event studies.[1] Despite many researchers applying the market model, I saw that some do not state the underlying stock market they considered to calculate market returns. This is problematic as the determination of market returns very much influences the ARs calculated in a later stage. Therefore, researchers should provide transparency in that regard and outline the underlying stock market. Finally, I reviewed how researchers defined their estimation windows. First, I acknowledge heterogeneity regarding how researchers define estimation windows. As outlined in section 5, researchers usually tend to formulate precise estimation windows with respect to the lower and the upper boundaries. For reasons of traceability, transparency, and replicability, I propose that all

[1] For reasons of simplicity, I omit a discussion about the Carhart (1997) four-factor model and the more recent Fama and French (2015) five-factor model, which are also favorable to employing the market model. For an in-depth discussion about the estimation procedures, please refer to Bouzzine et al. (2019).

researchers should formulate such precise estimation windows and omit vague formulations such as “52 weeks” (Badrinath & Bolster, 1996) and “2 years” (Blacconiere & Patten, 1994). Second, with respect to length, MacKinlay (1997) proposes that the upper bound of the estimation window maximum should be set to 20 days before the event to avoid anticipatory effects of the event biasing the estimation. As my review revealed, many studies do not leave much space between the end of the estimation and the beginning of the event window (e.g., Klassen & McLaughlin, 1996; Konar & Cohen, 1997; Xu et al., 2012) which allows potential bias of the estimation coefficients. Accordingly, I argue that future researchers should adhere to the time frame set by MacKinlay (1997) with an upper bound of the estimation window a maximum of 20 days before the event.

Second, future research should consider multiple event windows in examinations. My review revealed that many event studies solely rely on one single event window to capture the market reaction, suggesting that the market only reacts in this very event window. However, this might not account for potential information leakage (McWilliams & Siegel, 1997), investor anticipation (Bhattacharya et al., 2000), and delayed learning effects (Bebchuk et al., 2013) that would require event window extensions. Therefore, I argue that researchers should at least consider further event windows that would enable the capture of potential information leakage, investor anticipation, and delayed learning effects.

Third, I suggest employing robust test statistics and including nonparametric test statistics to account for potential non-normality. As my review revealed, the vast majority of studies rely on the common t-test which convinces with simplicity but exhibits flaws with regard to cross-sectional correlation and volatility. In that sense, I argue that the test statistics that overcome most of the statistical problems should be employed. Therefore, I argue in favor of the Boehmer et al. (1991) standardized cross-sectional test as this is suitable for any AR distribution within the event windows and robust against event-induced volatility and serial correlation of ARs

(although not against the cross-sectional correlation of the ARs). The issue of cross-sectional correlation of ARs has been addressed by Kolari and Pynnönen (2010) with their adjustment of the standardized cross-sectional test. Accordingly, this test statistic is, to date, the most suitable to test ARs in event studies. On top of that, in cases of industry-wise event clustering, the notion of cross-sectional correlation becomes highly relevant. Given an economy-wide event that affects multiple firms in an industry (MacKinlay, 1997), it is likely that there would be substantial cross-correlation of the ARs across affected firms. With respect to environmental pollution events, many of the violation (e.g., Dieselgate) and especially the disaster events (e.g., Deepwater Horizon) represent economy-wide shocks that drag down multiple firms in an industry (Bouzzine & Lueg, 2020; Fracarolli Nunes & Lee Park, 2016; Humphrey et al., 2016; Jacobs & Singhal, 2020) and, most certainly, come with strongly correlating ARs for affected firms. With respect to nonparametric testing, my review revealed that only a few studies employ a nonparametric test in their research design (Bouzzine & Lueg, 2020; Karpoff et al., 2005; Lundgren & Olsson, 2010; Scholtens & Oueghlissi, 2020; Tian et al., 2019), whereas different test statistics are employed. First, I critically acknowledge that researchers, by not considering nonparametric test statistics, suggest that the stock returns are normally distributed, a necessary condition for parametric testing (Strong, 1992). This, however, is eventually wrong as stock data frequently violate the normality assumption (Kon, 1984) and, therefore, requires at least a test of the normal distribution of stock returns (e.g., Shapiro and Wilk (1965) normality test routine) to confirm the normality of stock returns or the inclusion of a nonparametric test statistic in case a non-normality cannot be excluded. Second, I again propose the use of a nonparametric test statistic that overcomes statistical problems in the best way possible. The generalized rank test by Kolari and Pynnönen (2011) has the advantages of being robust against cross-correlation of returns, serial correlation, event-induced volatility, and, is also more suitable for testing aggregated data such as CARs. Therewith, the generalized rank test

outperforms earlier nonparametric tests and should be the nonparametric test statistic of choice when conducting event studies.

My fourth methodological point in the review refers to the issue of confounding events and how to deal with them. The review illustrated that researchers treat confounding events very differently and, despite their potential biasing impact on the ARs, many researchers do not state how they have dealt with this issue. While it is rather difficult to derive a state-of-the-art in dealing with confounding events, keeping the event window fairly short helps to better control for confounding events as their likelihood substantially increases with the length of the event window. Accordingly, examinations with long event windows require extensive research to control for confounding events (McWilliams & Siegel, 1997). Moreover, as practiced by several researchers in the field, excluding or dropping observations that are potentially influenced by confounding events seems an easy and effective way of dealing with the issue, but does, however, require an event sample that is large enough to allow for these exclusions. Additionally, researchers could run supplemental analyses in which events that are potentially influenced by confounding events are excluded to check the robustness of the initial main model. Hence, there are multiple ways to deal with confounding events which are also carried out regularly in event studies of environmental pollution and researchers should be encouraged to use, and document the use of, whichever is (are) most appropriate for their study.

Fifth, I propose the inclusion of robustness checks. My review revealed that not only do approximately 50% of the studies not include such checks but that researchers in the field follow different approaches in testing the robustness of their findings. I want to point out a robustness check that deserves particular interest. In my second methodological recommendation, I briefly discussed the use of different estimation procedures. Many researchers acknowledged that there are substantial differences in these estimation techniques and, therefore, included variation in estimation techniques by replacing the whole model with another (Flammer, 2013; Gupta &

Goldar, 2005; Jin et al., 2020; Little et al., 1995; Lopatta & Kaspereit, 2014; Lundgren & Olsson, 2010; Zeng et al., 2021). I see this approach as particularly valuable since replacing the estimation model with an alternate model, given the initial findings hold, comprehensively confirms the findings and provides evidence for the validity of the estimation procedure. I, therefore, argue that this replacement is a suitable way of conducting comprehensive robustness checks. Besides, as practiced by researchers in the field, a battery of robustness checks is potentially applicable and should be employed to the specific needs of the course of investigation. Accordingly, examinations of a large sample of events could comprise an exclusion of dominant events (Flammer, 2013), firms (Lopatta & Kaspereit, 2014), and industries (Little et al., 1995; Muoghalu et al., 1990) that potentially drive the overall results whereas examinations that are more concerned with deriving in-depth conclusions about relationships of specific characteristics should include correlation tests (Flammer, 2013) or additional cross-sectional analyses (Humphrey et al., 2016). Conducting robustness checks to test the sensitivity of the findings in future research should be an inherent part of studies as they offer further support for the initial findings.

Sixth, I argue that researchers should include cross-sectional analyses of their ARs. My review demonstrates that cross-sectional analyses are yet not conducted regularly in examining environmental pollution events. Of course, I acknowledge that cross-sectional analyses are not part of conventional event study methodology; however, they represent suitable methods of analyzing the determinants of the ARs and, thus, deserve consideration in this review. Thereby, I argue that cross-sectional analyses of the CARs are particularly valuable if there are substantial differences in CARs across firms. In these cases, cross-sectional analyses might help to detect the drivers of these differences which would remain unexplored if they are omitted. Then, if cross-sectional analyses are performed to detect the determinants of the CARs of environmental pollution events, researchers should include two specific variables in the

analyses. First, media coverage plays an important role in determining the magnitude of the market reaction to firm misconduct (Carberry et al., 2018; Clemente & Gabbioneta, 2017). Accordingly, this variable might be relevant to examinations of environmental pollution events (especially for violations) as high media coverage magnifies the stock price impact: this has already been demonstrated by Hamilton (1995) and Xu et al. (2012) and should be further considered in future cross-sectional analyses, at least as a control variable. The second variable that deserves consideration in cross-sectional analyses and has been neglected thus far is firms' CSR performance (often operationalized by ESG performance (Derchi et al., 2020; Shahbaz et al., 2020)). As outlined by Bae et al. (2020) and Christensen (2016), CSR performance exhibits a protective function against the negative effects of firm misconduct which might also partially explain why some firms are less badly affected by environmental pollution events than others. This, however, remains unconsidered in terms of environmental pollution so far and should therefore be considered in future research to fill this research gap.

Seventh, I propose that researchers should quantify the ARs in monetary units. My review revealed that the majority of studies do not take this opportunity to compellingly illustrate and communicate the extent of the environmental pollution event to the reader. Therefore, I propose that researchers should express their CARs derived from examining environmental pollution events in monetary units and that the calculation should be transparent.

Conclusion

Based on a systematic literature review of 38 event studies from 1990–2020 examining environmental pollution events, this paper aimed to answer three research questions: 'How can stock-based event studies of environmental pollution events be systemized?', 'What are the syntheses and limitations of this field in terms of the empirical findings, theories, and methodological specifications?' and 'What should be the resulting research agenda on environmental pollution events?'

With regard to RQ1, I first outline that the extant literature in this field can comprehensively be attributed to four research subfields: pollution disclosures; environmental violations, legal penalties, and law enforcement disclosures; environmental disaster disclosures; and multifaceted disclosures. Concerning RQ2 and RQ3, I performed three distinct reviews of the empirical findings, underlying theoretical frameworks, and methods. This allowed me first to identify limitations in these three areas and second to develop meaningful recommendations. In total, I provide four research, two theoretical, and seven methodological recommendations to advance future event studies examining environmental pollution events. These should help to advance the field in terms of addressing research gaps, and providing more sophisticated theoretical frameworks as well as better methodological validity.

On top of that, this SLR comprehensively revealed to practitioners, based on the findings of the extant literature, that capital markets indeed represent functioning external corporate governance mechanisms not only for environmental compliance and pollution control (Dasgupta et al., 2001; Karpoff et al., 2005) but also for environmental disaster prevention (Carpentier & Suret, 2015; Dong et al., 2020). These costs related to environmental malperformance give special attention to environmental management in a broader sense. As outlined by various scholars, firm environmental management might go well beyond an operational perspective and target strategic motives, such as enhancing customer satisfaction and loyalty, improving stakeholder relations, enhancing environmental awareness, obtaining and maintaining societal legitimacy, and, eventually, obtaining a competitive advantage also translating in financial benefits (Babiak & Trendafilova, 2011; Brammer et al., 2012; Chiarini, 2017; Flammer, 2013). Accordingly, I conclude that environmental management assumes a pivotal role in firm strategy that might be a potential driver for both economic downturns and upswings and, therefore, propose that firms should critically reflect on the properness of their environmental management. This becomes even more relevant as firm environmental

performance increasingly falls under societal scrutiny (Ardito & Dangelico, 2018; Bhattacharyya & Cummings, 2015; Kassinis & Vafeas, 2006).

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Tables

Table 1: Literature table

Authors	**Year**	**Journal**
Badrinath and Bolster	1996	Journal of Regulatory Economics
Basse Mama and Bassen	2013	Applied Economics
Blacconiere and Patten	1994	Journal of Accounting and Economics
Bosch et al.	1998	Managerial and Decision Economics
Bouzzine and Lueg	2020	Business Strategy and the Environment
Cañón-de-Francia et al.	2008	Ecological Economics
Capelle-Blancard and Laguna	2010	Journal of Environmental Economics and Management
Carpentier and Suret	2015	Journal of Environmental Economics and Management
Dasgupta et al.	2006	Ecological Economics
Dasgupta et al.	2001	Journal of Environmental Economics and Management
Flammer	2013	Academy of Management Journal
Fracarolli Nunes and Lee Park	2016	Journal of Global Responsibility
Gupta and Goldar	2005	Ecological Economics
Hamilton	1995	Journal of Environmental Economics and Management
Herbst et al.	1996	Global Finance Journal
Humphrey et al.	2016	Journal of Risk Finance
Jacobs and Singhal	2020	Production and Operations Management
Jin et al.	2019	Business Strategy and the Environment
Karpoff et al.	2005	Journal of Law and Economics
Kawashima and Takeda	2012	Energy Economics
Khanna et al.	1998	Journal of Environmental Economics and Management
Klassen and McLaughlin	1996	Management Science
Konar and Cohen	1997	Journal of Environmental Economics and Management
Lanoie et al.	1998	Ecological Economics
Laplante and Lanoie	1994	Southern Economic Journal
Little et al.	1995	Journal of Accounting, Auditing & Finance
Lopatta and Kaspereit	2014	Energy Economics
Lorraine et al.	2004	Accounting Forum
Lundgren and Olsson	2010	Applied Financial Economics
Muoghalu et al.	1990	Southern Economic Journal
Sabet et al.	2012	Australian Journal of Management
Scholtens and Oueghlissi	2020	Business Strategy and the Environment
Tian et al.	2019	Journal of Cleaner Production
Wood et al.	2018	Journal of Macromarketing
Xu et al.	2012	Journal of Business Ethics
Xu et al.	2016	Business Strategy and the Environment
Zeng et al.	2020	Journal of Cleaner Production
Zou et al.	2014	Journal of Cleaner Production

Table 1 displays the studies considered in this review, their publication year, and the corresponding journal.

Table 2: Research samples

Authors	Countries	Period	Event samples
Subfield A: Pollution disclosures			
Cañón-de-Francia et al.	Spain	2004	80 facility listings relating to 28 firms on the European Pollutant Emission Register
Gupta and Goldar	India	1999–2002	50 ratings within the Green Rating Project by the CSE (Indian NGO)
Hamilton	USA	1989	436 TRI releases by the US EPA
Khanna et al.	USA	1989–1994	91 TRI releases by the US EPA
Konar and Cohen	USA	1989–1992	130 TRI releases by the US EPA
Subfield B: Environmental violation, legal penalty, and law enforcement disclosures			
Badrinath and Bolster	USA	1976–1991	4044 judicial civil actions by the US EPA
Bosch et al.	USA	1970–1990	171 law enforcements by the US EPA
Bouzzine and Lueg	Germany	2015–2019	10 Dieselgate events (US EPA and news)
Dasgupta et al.	South Korea	1993–2000	87 listings on the monthly violation reports by South Korea's Ministry of the Environment
Fracarolli Nunes and Lee Park	USA	2015	1 Dieselgate event (US EPA)
Jacobs and Singhal	International	2015	1 Dieselgate event (US EPA)
Karpoff et al.	USA	1980–2000	478 environmental violations (news)
Lanoie et al.	Canada	1990–1992	5 lists of polluters including 19 firms by the Ministry of the Environment of British Columbia (Canada)
Laplante and Lanoie	Canada	1982–1991	47 environmental events (violations, legal actions, suit settlements, etc.) (news)
Little et al.	USA	1977–1986	103 hazardous waste mismanagement lawsuits (news)
Lorraine et al.	UK	1995–2000	23 pollution fines (news)
Lundgren and Olsson	International	2003–2006	142 environmental violations (GES investment services)
Muoghalu et al.	USA	1977–1986	128 lawsuits for toxic or hazardous materials mismanagement (news)
Tian et al.	China	2016	270 environmental inspections by the Chinese Central Government
Wood et al.	International	1984–2016	41 automotive environmental failures (news)
Xu et al.	China	2010	57 environmental violations (China's Ministry of Environmental Protection)
Xu et al.	China	2007–2011	173 environmental violations (news)

Zeng et al.	China	2016	1 Central Environmental Protection Inspection implementation event (China's Ministry of Environmental Protection)
Zou et al.	China	2007–2011	59 environmental violations (China's Ministry of Environmental Protection)
Subfield C: Environmental disaster disclosures			
Basse Mama and Bassen	International	2011	1 Fukushima nuclear accident event (news)
Blacconiere and Patten	International	1984	1 Bhopal chemical leak accident event (news)
Capelle-Blancard and Laguna	International	1990–2005	64 explosions in chemical plants and refineries (news)
Carpentier and Suret	USA	1959–2010	38 major environmental accidents (news)
Herbst et al.	USA	1989	1 Exxon Valdez accident event (news)
Humphrey et al.	USA	2010	7 Deepwater Horizon accident events (news)
Kawashima and Takeda	Japan	2011	1 Fukushima nuclear accident event (news)
Lopatta and Kaspereit	International	2011	1 Fukushima nuclear accident event (news)
Sabet et al.	USA	2010	8 Deepwater Horizon accident events (news)
Scholtens and Oueghlissi	International	1989–2016	46 environmental disasters (earthquakes and spills) (news)
Subfield D: Multifaceted disclosures			
Dasgupta et al.	International	1990–1994	87 negative environmental events (e.g., spills, complaints, warnings) (news)
Flammer	USA	1980–2009	156 eco-harmful events (news)
Jin et al.	China	2014–2018	65 environmentally irresponsible events (China's Ministry of Environmental Protection)
Klassen and McLaughlin	USA	1989–1990	22 environmental crisis events (news)

Table 2 displays the research samples, the observation periods and their source (in parenthesis), and the national settings. Furthermore, the studies are attributed to their respective subfields.

Table 3: Theoretical frameworks

Authors	Theoretical framework	Spillover effect
Subfield A: Pollution disclosures		
Cañón-de-Francia et al.	Efficient market hypothesis	No
Gupta and Goldar	Efficient market hypothesis	No
Hamilton	Undefined	No
Khanna et al.	Efficient market hypothesis	No
Konar and Cohen	Efficient market hypothesis	No
Subfield B: Environmental violation, legal penalty, and law enforcement disclosures		
Badrinath and Bolster	Undefined	No
Bosch et al.	Undefined	No
Bouzzine and Lueg	Agency and signaling theory	Yes
Dasgupta et al.	Undefined	No
Fracarolli Nunes and Lee Park	Inertial effect	Yes
Jacobs and Singhal	Undefined	Yes
Karpoff et al.	Undefined	No
Lanoie et al.	Undefined	No
Laplante and Lanoie	Optimal compliance strategy	No
Little et al.	Undefined	No
Lorraine et al.	Undefined	No
Lundgren and Olsson	Efficient market hypothesis	No
Muoghalu et al.	Undefined	No
Tian et al.	Undefined	No
Wood et al.	Undefined	No
Xu et al.	Undefined	No
Xu et al.	Signaling theory	Yes
Zeng et al.	Environmental regulation theory	No
Zou et al.	Signaling theory	Yes
Subfield C: Environmental disaster disclosures		
Basse Mama and Bassen	Efficient market hypothesis	Yes
Blacconiere and Patten	Efficient market hypothesis	Yes
Capelle-Blancard and Laguna	Undefined	Yes
Carpentier and Suret	Efficient market hypothesis	No
Herbst et al.	Undefined	Yes
Humphrey et al.	Undefined	Yes
Kawashima and Takeda	Undefined	Yes
Lopatta and Kaspereit	Undefined	Yes
Sabet et al.	Undefined	Yes
Scholtens and Oueghlissi	Undefined	No

Subfield D: Multifaceted disclosures		
Dasgupta et al.	Undefined	No
Flammer	Stakeholder theory and Resource-based view	No
Jin et al.	Efficient market hypothesis and Organizational legitimacy	Yes
Klassen and McLaughlin	Efficient market hypothesis	No

Table 3 displays the underlying theoretical frameworks of the regarded studies and illustrates whether the respective study examines a spillover effect. Furthermore, the studies are attributed to their respective subfield.

Table 4: Method specifications

Authors	Estimation model	Estimation window	Confounding events	Nonparametric tests
Subfield A: Pollution disclosures				
Cañón-de-Francia et al.	Market	Undefined	No	No
Gupta and Goldar	Market Mean adjusted returns	[-210, -120]	No	No
Hamilton	Market	[-100]	Yes	No
Khanna et al.	Market	[-110, -10]	Yes	No
Konar and Cohen	Market	[-250, -10]	Yes	No
Subfield B: Environmental violation, legal penalty, and law enforcement disclosures				
Badrinath and Bolster	Market Mean adjusted returns	52 weeks	Yes	No
Bosch et al.	Undefined	Undefined	No	No
Bouzzine and Lueg	Market	[-120, -21]	Yes	Yes
Dasgupta et al.	Market	[-210, -120]	Yes	No
Fracarolli Nunes and Lee Park	Market	[-200, -1]	No	No
Jacobs and Singhal	Market	[-211, -11]	Yes	No
Karpoff et al.	Undefined	Undefined	Yes	Yes
Lanoie et al.	Market	[-210, -120]	Yes	No
Laplante and Lanoie	Market	210 days prior to the event	No	No
Little et al.	Market	[-261, -61]	Yes	No
Lorraine et al.	Market	[-310, -11]	No	No
Lundgren and Olsson	Market Fama-French three-factor	[-88, -1]	No	Yes
Muoghalu et al.	Market	Undefined	No	No
Tian et al.	Market	[-100, -21]	No	Yes
Wood et al.	Market	[-211, -11]	Yes	No
Xu et al.	Market	Undefined	No	No
Xu et al.	Market	[-240, -60]	No	No
Zeng et al.	Market	[-100, -10]	No	No
Zou et al.	Market	[-200, -50]	Yes	No

Subfield C: Environmental disaster disclosures				
Basse Mama and Bassen	Market	[-351, -7]	Yes	No
Blacconiere and Patten	Market	Two years	Yes	No
Capelle-Blancard and Laguna	Market	[-190, -10]	No	No
Carpentier and Suret	Fama-French three-factor Carhart four-factor	Undefined	No	No
Herbst et al.	Market	[-236, -17]	No	No
Humphrey et al.	Market	Undefined	No	No
Kawashima and Takeda	Market	[-250, -1]	No	No
Lopatta and Kaspereit	Carhart four-factor	[+30, +280]	Yes	No
Sabet et al.	Market	Undefined	No	No
Scholtens and Oueghlissi	Market	[-123, -4]	No	Yes
Subfield D: Multifaceted disclosures				
Dasgupta et al.	Market	[-210, -120]	No	No
Flammer	Market	[-240, -41]	Yes	No
Jin et al.	Market Fama-French three-factor	[-190, -11]	No	No
Klassen and McLaughlin	Market	[-209, -10]	No	No

Table 4 displays some of the methodological specifications of the regarded studies. Furthermore, the studies are attributed to their respective subfield.

Figures

Figure 1: Interrelation of the research subfields

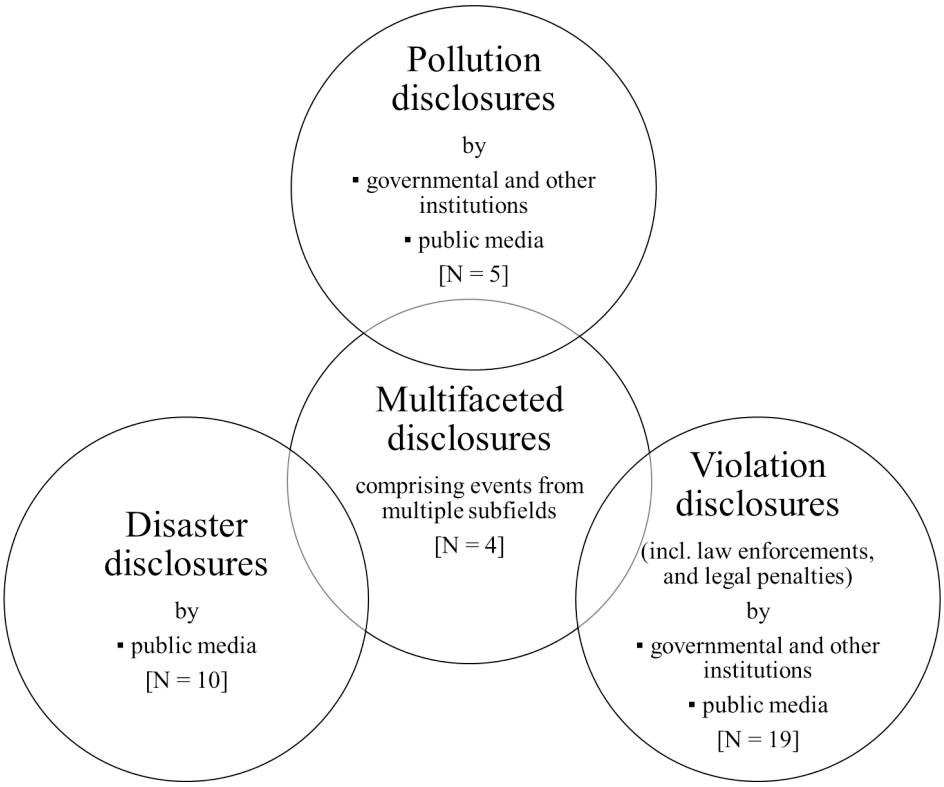

Figure 1 illustrates how the four research subfields interrelate and provides the information disclosers as well as the number of studies relating to each subfield.

Figure 2: Theoretical framework of direct effects

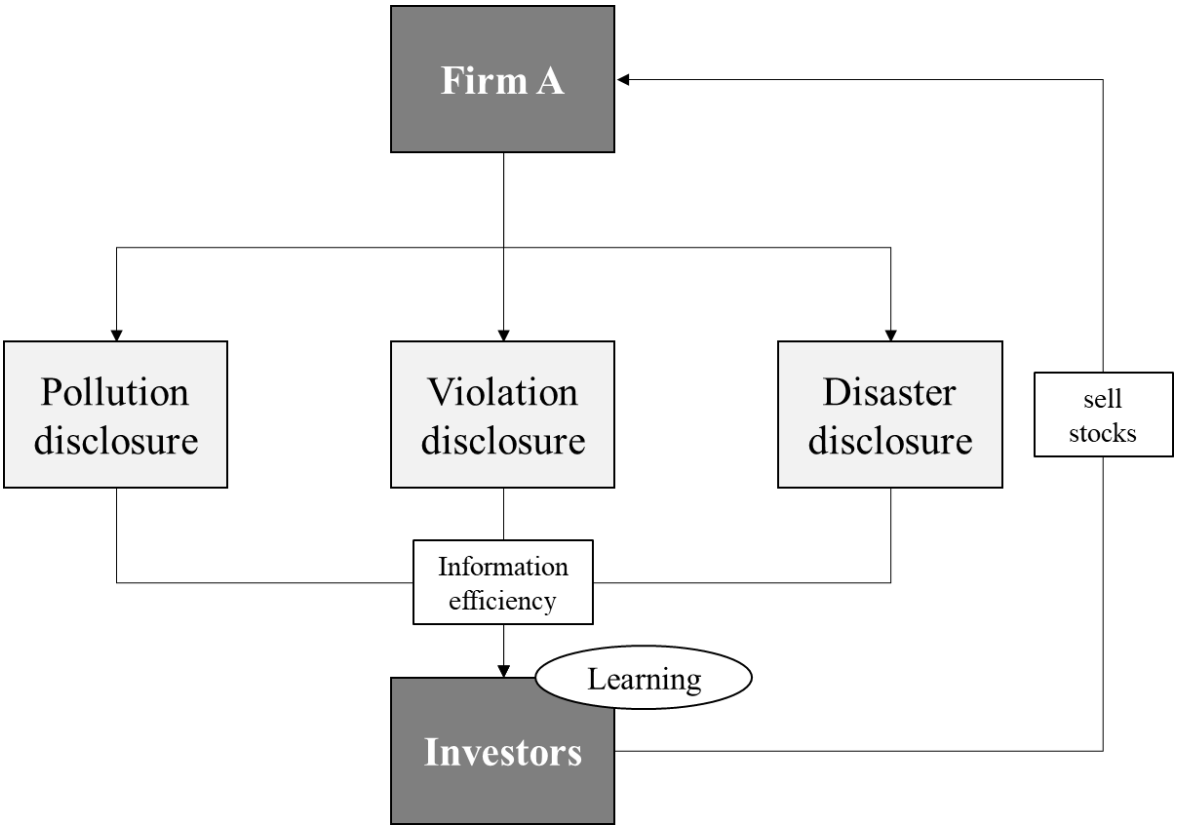

Figure 2 illustrates the underlying theoretical framework for the direct effect of an environmental pollution event and how it translates into financial penalties.

Figure 3: Theoretical framework of spillover effects

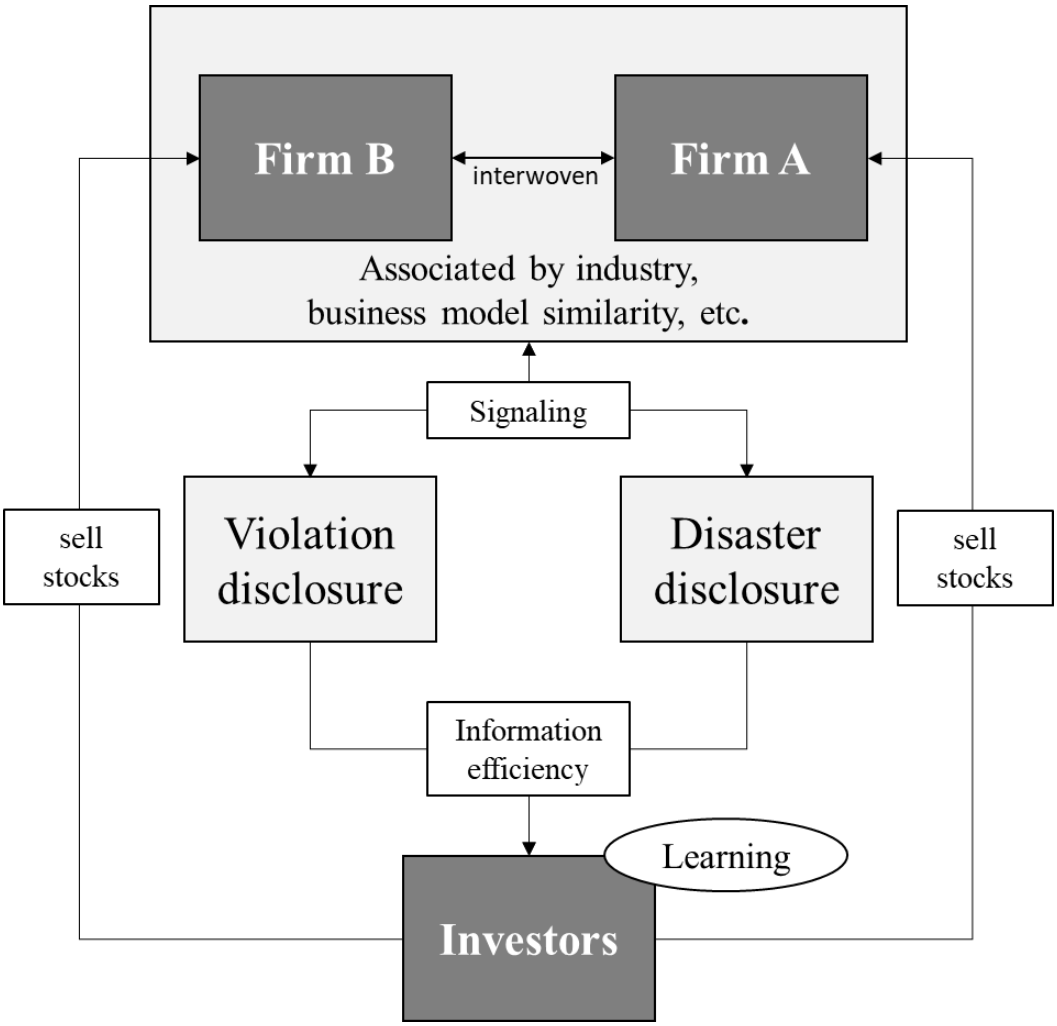

Figure 3 illustrates the underlying framework for the spillover effect of an environmental violation and an environmental disaster disclosure and how these environmental pollution events translate into the financial contagion of peer firms.

3 The contagion effect of environmental violations: The case of Dieselgate in Germany

Abstract

We examine how environmental violations affect the stock returns of the violating firm, and how these financial implications then spread to industry peers. Volkswagen's diesel emissions scandal (Dieselgate) and the German automotive industry serve as a seminal case for the examination. Research often limits examinations of corporate environmental scandals to the primary event announcement. Yet, the Dieselgate scandal exhibits a processual character that requires the examination of multiple events over time. We identify 10 Dieselgate events and employ event study methodology to detect abnormal stock reactions. Based on agency and signaling theory, the results indicate that Dieselgate has harmed the stock returns of Volkswagen and its industry peers substantially. Surprisingly, Volkswagen suffered financial damage only upon the initial event of Dieselgate. Subsequent events had significant effects only on industry peers. These findings contribute comprehensively to the research of environmental misconduct and provide valuable implications for practitioners.

Keywords: Environmental violation, Contagion effect, Dieselgate, German automotive industry, Business model, Event study

Introduction

A growing body of academic literature deals with the question of how a firm's financial performance reflects environmental incidents. There is rich empirical evidence that the announcement of environmental regulation violations and poor environmental performance damages a firm's stock substantially (Dasgupta et al., 2006; Dasgupta et al., 2001; Gupta and Goldar, 2005; Lundgren and Olsson, 2010). We contribute to this stream of literature using the case of Dieselgate. Specifically, we address the contagion effect on industry peers that relate to new, pertinent events after the scandal's first revelation.

Volkswagen's (VW) Dieselgate is one of the biggest ongoing corporate environmental violation scandals globally. In 2014, a research team of the West Virginia University investigated the emissions of VW diesel vehicles following suspicions by other automotive firms. This investigation revealed that nitrogen oxides (NO_x) emissions for a running VW Jetta 2012 and a VW Passat 2013 to be much higher than the declared test values, a finding that the US Environment Protection Agency (EPA) could confirm (Robertson, 2017). In direct response, VW recalled and 'repaired' affected diesel vehicles; however, this did not mitigate the excessive emissions, which led to both the EPA and the California Air Resource Board withholding approval for the 2016 model-year VW diesel vehicles. Eventually, VW had to admit that they had implemented a software-based defeat device in the 2009–2015 vehicle models with 2.0-liter diesel engines, which recognized when a vehicle was undergoing emissions testing and automatically adjusted emissions to legal threshold values. This led the EPA to issue a notice of violation accusing VW of contravening the US Clean Air Act (the EPA announcement on 18 September 2015). The EPA stated that the NO_x emissions of these particular diesel vehicles were 10-40 times higher than allowed (Barrett et al., 2015). While Dieselgate represents the latest automotive environmental violation scandal, using defeat devices for emissions testing has a history. The EPA enforced penalties against other

automotive firms (e.g., Honda and Ford) for emissions manipulation in the past (Schaeffer, 1998), making the fallout of Dieselgate repetitive. To conclude, Dieselgate represents a corporate scandal combining dismal ecological performance with fraudulent characteristics, which provides broader insights into the theoretical understanding of corporate environmental violations. While the emergence of management's unethical behavior exhibits links to agency problems, a firm's unethical behavior might signal common business practices of misconduct within the industry to the stakeholders. This is particularly so for interrelated and similar industries such as the German automotive industry. In these settings, the impact of major corporate scandals may not be limited to the guilty firm, and the risk of industry peer contagion increases (Laufer and Wang, 2018).

Existing studies explain very well the negative stock returns for VW, as well as a negative spillover (contagion) effect on industry peers and suppliers around the initial EPA announcement (Barth et al., 2017; Griffin and Lont, 2018; Nunes and Park, 2016; Wood et al., 2018). However, we know little about Dieselgate's financial effects on VW and its industry peers after new information became available. All prior event studies on Dieselgate limit their examination to the EPA announcement on 18 September 2015. Yet, Dieselgate comprises several subsequent events, some of them still ongoing (e.g., diesel vehicle bans in cities). Moreover, the German automotive industry provides a special setting for the analysis of Dieselgate. Germany's car manufacturing industry is closely linked and stakeholders overlap heavily, making Dieselgate a German automotive rather than a purely VW problem. Then, it represents one of Germany's biggest economic sectors, employers, and institutions (The Economist, 2018). Additionally, Germany's automotive industry espouses strong interlocks among and across supply chains (Barthel et al., 2015). Nonetheless, current studies do not analyze Dieselgate's impact on stock returns in a manner that accounts for both further events and the contagion effect. Thus, we conjecture that the impact of environmental violations

deserves special attention among German car manufacturers. This motivates us to pose the following research question:

RQ: How do Dieselgate announcements affect the stock returns of VW and its industry peers (contagion effect)?

Methodologically, we conduct an event study (Brown and Warner, 1985; 1980; MacKinlay, 1997). This methodology allows us to evaluate the impact on stock returns of Dieselgate events on both an individual and a group level. Thus, we extend the understanding of Dieselgate's financial impact in two ways: first, we use Dieselgate events in direct relation to VW (individual events) to measure the comprehensive reaction of VW's stock. Second, we use Dieselgate events affecting the overall automotive industry in Germany (group events) to determine the stock price reaction of industry peers individually as well as for a group. We select events based on how meaningful the media portrays them, as media has a strong impact on the public perception and the value relevance of a scandal (Carberry et al., 2018; Clemente and Gabbioneta, 2017; Xu et al., 2016).

Our findings suggest large and highly significant, negative abnormal stock returns for VW on the initial EPA announcement event. Deviating from our prediction, the following events remain statistically insignificant for VW, indicating that the markets have anticipated and priced the full extent of VW's misconduct. However, the contagion effect analysis of Daimler, BMW, and the car manufacturing group as a whole (portfolio of VW, Daimler, and BMW) reveals major significant and negative abnormal stock returns for subsequent events.

Our study makes four substantial research contributions to the literature on the financial effects of corporate scandals; first, we provide evidence for a strong horizontal contagion effect at the same level of the supply chain. Second, our analyses demonstrate that the full extent of the contagion effect becomes better visible by considering subsequent events over a longer

timeline. Third, we combine information economic theoretical frameworks, which help to better understand the stock market reaction to VW and the contagion effect. We conjecture that two related theoretical perspectives are necessary to grasp the financial impact of the corporate scandal itself (agency theory) and the financial contagion effect on industry peers (signaling theory). Fourth, we show that the 'guilty by association' effect holds in the specific case of Dieselgate, where the heavy industry peer contagion effect (sum of stock losses for Daimler and BMW for the specification with the highest significance, respectively) exceeds the financial loss of VW by 54.85%. For practitioners, our study holds two important contributions; first, we illustrate that violating environmental regulations to obtain business advantages might not payoff and the downsides might be overwhelming. Second, we conclude that firms that are too interwoven and similar in their business models are subject to becoming 'guilty by association' and, thus, should actively ensure a differentiation from industry peers to avoid financial contagion.

The remainder of this paper is organized as follows: Section 2 provides the background of our analysis including the theoretical foundation of the respective stock market reactions as well as the relevant literature, both synthesized to derive the research hypotheses. Section 3 specifies our event study methodology and data. Section 4 presents the empirical findings. Section 5 provides a discussion, critical acknowledgments, and a conclusion.

Background

To derive the research hypotheses of this study, we develop a framework that combines two related theories from the school of information economics: agency theory and signaling theory.

The direct effect of Dieselgate: an agency-theory-based hypothesis

Agency theory assumes that interests and utilities between the principal and the agent, assigned to act on behalf of the principal, are not necessarily aligned, which may lead to agency problems such as moral hazard (Eisenhardt, 1989; Fama, 1980; Jensen and Meckling, 1976; Ross, 1973). Corporate misconduct meant to obtain a competitive advantage over industry peers can be attributed to this notion (Carson, 2003). Industry peers' inability to replicate the emission values of VW diesel vehicles helped VW to penetrate the US market aggressively and to become one of its leading diesel vehicle vendors (Barrett et al., 2015; Nunes and Park, 2016). The embedded quest for aggressive growth within the corporate culture, in line with VW's strategy to become the leading automotive firm (Armstrong, 2017), exhibits clear characteristics of shareholder primacy, a corporate maxim well-discussed by law scholars (Smith, 1998; Lee, 2005). In settings of shareholder primacy, all corporate actions target the maximization of shareholder value which might imply diminished moral responsibility and "short-termism" (Burkert and Lueg, 2013; Smith and Rönnegard, 2016; Stout, 2013). Supporting the shareholder primacy perspective, a strong performance-driven compensation component for the management fostered VW's quest for aggressive growth. This further created incentives for short-term orientation and unethical behavior to maximize shareholder value and personal compensation (Li et al., 2018). When tests detected the fraud in 2014 and the EPA initiated the enforcement procedure against VW, investors anticipated the potential financial losses for VW and reacted accordingly. However, the release of value-relevant information did not end with the EPA announcement. During the ongoing course of Dieselgate, the media has disclosed new and relevant information over time and portrayed Dieselgate events prominently and, thereby,

VW's misconduct, responsibility, and its consequences credibly. By that, these information become particularly value-relevant (Carberry et al., 2018). This myopic perspective on shareholders, which led to Dieselgate, had a significant impact on other stakeholders whose demands fell behind in VW's growth strategy.

Hill and Jones (1992) provide an extensive framework in their stakeholder-agency theory, in which stakeholders assume the principal's role. Thereafter, every single group of stakeholders has specific demands on the management, which, if satisfied, lead to superior business performance due to better access to stakeholders' resources. The inversion of this argument implies that neglecting the demands of stakeholder groups might induce restricted access to resources. Applying this stakeholder-based framework to VW emphasizes that the fraudulent software implemented did not only hurt the shareholders but many other stakeholders as well. Customers had to deal with the issue of resolving the cheating software as well as with the decreased market value of their vehicles (Markowitz et al., 2017). Suppliers and retailers faced reduced popularity of diesel engines which negatively affected their sales figures (Nunes and Park, 2016). Employees had to worry about their jobs for the same reason (Müssgens and Peitsmeier, 2016). The government saw their environmental regulations disregarded as well as major public health and environmental damage as a result of the excess NO_x emissions (Chossière et al., 2017; Dey et al., 2018; Holland et al., 2016; Oldenkamp et al., 2016; Tanaka et al., 2018). These consequences led stakeholders to penalize VW with calls for boycotts (customers), penalty fines (government), and other means of stakeholder activism with implications for the stock price. Thus, the stock market reaction to VW in response to the announcement of Dieselgate should be analyzed in a (stakeholder-) agency context.

In accordance with this theoretical framework, researchers provide extensive empirical evidence on the stock market reaction to the announcement of corporate misbehavior, bad environmental performance, and environmental regulation violations. Gunthorpe (1997) finds

negative abnormal returns (ARs) for firms that have announced that they engaged in any kind of unethical behavior or that they are under investigation for it. Specifying the notion of unethical behavior to environmental issues, Gupta and Goldar (2005) find that the announcement of bad environmental performance in terms of the Green Rating Project by India's Centre for Science and Environment triggered a negative stock price reaction. Hamilton (1995) and Khanna et al. (1998) complement the examination of environmental issues by looking at the public disclosure of toxic release information. They conclude that the announcement of toxic waste releases negatively affects the stock returns of the firms involved. Klassen and McLaughlin (1996), Dasgupta et al. (2001), and Flammer (2013) examine further corporate environmental misbehavior announcements such as spills and contaminations and consistently derive a negative reaction by investors to these announcements. As an extension of the examinations of environmental misbehavior, Lanoie et al. (1998) integrate the legal dimension of violating environmental regulations and investigate the information release that a firm is listed on the 'out of compliance' and 'of concern' list of polluters in Canada. They report a negative stock market reaction, which is even more pronounced for large polluters. Dasgupta et al. (2006) apply a similar methodology and analyze the announcements of the monthly list of firms that do not comply with environmental regulations in South Korea and came to the same conclusion. Lundgren and Olsson (2010), as well as Xu et al. (2012), confirm this finding comprehensively in their examinations of an international and a Chinese sample of environmental standard violation announcements. While the majority of authors focuses on the environmental issue itself, Bosch et al. (1998) investigate the announcement of an EPA pollution control enforcement as the consequence of violating environmental regulations and conclude a strong and negative stock reaction for the targeted firm, as losing a legal case to the EPA is associated with high costs for the polluter. In conclusion, empirical research shares the finding that the announcement of corporate environmental misbehavior and environmental violations affects the stock price of the firm negatively.

Empirical Dieselgate literature complements the extensive evidence on the stock reaction to poor environmental performance and environmental violation announcements and displays similar findings. Barth et al. (2017) conduct a comprehensive event study on Dieselgate using stock, bond, and credit default swap (CDS) data. For VW, they conclude significant financial losses as a result of the EPA announcement, which are robust against variations in event windows and security types. We complement their research approach by considering a longer timeline (i.e., multiple events) in our examination. On a broader scale, Wood et al. (2018) examine the abnormal stock reaction to 41 car manufacturers' environmental failure announcements (i.e., unethical behavior, deception, failure to meet standards) for an international set of firms. They find highly significant, negative, mean ARs for the announcement of a car manufacturer's environmental failure with results being robust against variation in estimation models. Thereby, stock losses due to environmental failure announcements following Dieselgate are stronger than those resulting from prior announcements as Dieselgate damaged consumer confidence in car manufacturing substantially and increased investors' risk-aversion to environmental issues. We address this increase in investors' risk-aversion to environmental issues in car manufacturing in our in-depth analysis of VW and illustrate how investors value VW's stock throughout Dieselgate. Thus, as expected, the results suggest that the stock market reacts negatively to the Dieselgate announcement by the EPA. From the agency theoretical context, the ongoing emergence of new and relevant information during Dieselgate, and the extensive empirical evidence, we derive our first research hypothesis:

H1: The announcement of Dieselgate individual events is associated with negative ARs for VW.

The contagion effect of Dieselgate: a signaling-theory-based hypothesis

Intentional environmental fraud and the corresponding stock market reaction to the fraudulent firm results from existing agency conflicts such as shareholder primacy *inside* the firm. Additionally, understanding the *contagion effect* from VW to industry peers requires the consideration of a complementary theory building on different aspects of the same information asymmetry. According to signaling theory, two parties hold different information bases and, typically, one party has an information advantage over the other. The information sender (signaler) decides how to communicate the information to the recipient. The recipient then interprets this information, processes it, and reacts upon it through feedback or other means (Connelly et al., 2011; Spence, 1973). Zou et al. (2015a) employ the signaling theory to derive a theoretical framework that explains the contagion effect of environmental violations. According to them, the environmental violation announcement of one firm reveals the environmental risks of the whole industry as its members share the same (or very similar) technical conditions and the production output. Therefore, the announcement passively signals the inherent industry risk to stakeholders, making them reassess their assumptions about the attractiveness of the industry and the corresponding resource distribution.

Signaling has direct implications for Dieselgate. Dieselgate revealed issues involving compliance with environmental standards in the US which had led to environmental fraud to overcome them. More precisely and in line with the notion of moral hazard, VW simply was not able to meet the environmental standards in the US with its technic and without exceeding the budget and, therefore, decided for fraud to gain a competitive edge over industry peers (McGrath Goodman, 2015). The public announcement of the EPA passively signals the risk of this environmental fraud within the industry to the stakeholders, causing them to question the integrity of the German automotive industry in general. Laufer and Wang (2018) show that crisis contagion is most likely when firms are similar and share the country of origin, industry,

and organizational type (profit orientation, ownership structure, etc.), as well as positioning strategy (high-end vs. low-end orientation). Ouyang et al. (2020) specify this finding for the context of environmental misconduct and illustrate that stakeholders tend to categorize firms by similarity. Looking at the case of Dieselgate, most of the crisis contagion criteria fit German car manufacturers. They have the same country of origin as well as industry, organizational structure (Barthel et al., 2015; Fasse, 2019), and, to a large extent, positioning strategy (GTAI, 2018; The Economist, 2018); thus, the risk of contagion from VW to other German car manufacturers is high due to their perceived similarity. This financial contagion is, most likely, a consequence of investors' learning. As pointed out by Bebchuk et al. (2013), investors tend to adapt to changes over time within a learning procedure and take this learning into account in their investment decision. As above mentioned, Dieselgate passively signaled the risk of misconduct and a corresponding EPA enforcement for other German automotive firms emphasized by the strong interlocks between German automotive firms. This passive signal then triggered a learning process at the investors who saw themselves exposed to both the risk of Daimler and BMW being involved in the scandal and the risk of financial losses. This, in turn, led them to sell their stake in these firms. Figure 1 illustrates our underlying theoretical framework composing of agency and signaling elements.

--- PLEASE INSERT FIGURE 1 ABOUT HERE ---

Several authors provide empirical evidence for a contagion effect from corporate scandals or incidents. In 2010, BP's Deepwater Horizon oil platform caught fire, which led to a massive oil spill in the Gulf of Mexico. Event studies on the Deepwater Horizon oil spill by Humphrey et al. (2016) and Sabet et al. (2012) illustrate how the incident affects the overall oil and gas industry. Even though the incident does not represent intentional environmental fraud, the studies provide insights into the existence of a contagion effect from environmental incidents. The Deepwater Horizon incident, with its far-reaching consequences on drilling in the Gulf of

Mexico, not only impacts the stock of BP and other firms directly involved in the oil spill but also that of unrelated oil and gas exploration, drilling, equipment, and services firms. The market is, however, able to differentiate between firms as the spill affects oil and gas firms not involved in offshore drilling (e.g., pipeline companies) less heavily. Regarding intentional environmental misconduct, Zou et al. (2015a) specifically examine the contagion effect from environmental violations using 59 announcements across industries by China's Ministry of Environmental Protection for their event study. They conclude a negative intra-industry contagion effect to 282 industry peers, which is more pronounced for firms in environmentally insensitive business areas (e.g., coal mining). Jin et al. (2020) deal with a similar topic and examine environmental misconduct in environmentally sensitive industries (extractive, chemical, steel, and building materials industries) in China and derive significant negative reactions to their public announcement by China's Ministry of Ecological and Environmental Protection for the misconducting firm. More interestingly, however, they reveal a notable spillover effect from the misconducting firm to its industry. Hence, an industry peer contagion effect is observable for various incidents and scandals irrespective of the type (environmental scandal, accounting scandal, etc.).

Several authors detect a contagion effect from Dieselgate using the EPA announcement event. Nunes and Park (2016) examine 33 automotive firms in a US-based event study. Based on the EPA announcement event, they divide their sample of firms into car manufacturing and supplier companies. They find large and significant abnormal stock losses for 2 US car manufacturing firms and 8 out of 27 suppliers. Both findings are robust to variation in event windows and so confirm the existence of a financial contagion effect from VW to car manufacturers and suppliers in the US, which is however limited to the EPA announcement. Providing further evidence for the contagion effect from the EPA announcement, Griffin and Lont (2018) employ an international sample of 16 car manufacturers including VW. They find

negative average ARs for the announcement event of Dieselgate. The results are robust against variation in event windows and illustrate that the EPA announcement, on average, damages the overall automotive industry. However, their analysis does not allow for conclusions about the contagion effect on specific industry peers of VW following the EPA announcement. Barth et al. (2017) enhance this finding comprehensively by analyzing the contagion effect from Dieselgate using stock, bond, and CDS data of 25 industry peers and 101 suppliers of VW. Thereby, they limit their study to the EPA announcement event. The analysis of industry peers displays negative stock and bond, as well as positive CDS spread reactions, for a variety of event windows. The analysis of the suppliers, however, leads to less pronounced findings. Hence, the extant literature on the contagion effect of Dieselgate concludes that the EPA announcement generated a financial loss for VW's suppliers and industry peers, confirming the existence of a contagion effect for this event. By that, Dieselgate literature falls in line with other contagion effect analyses of corporate scandals. Based on the signaling theoretical context and the prevailing empirical literature, which confirms the existence of a contagion effect on industry peers (e.g., car manufacturers), we derive our second hypothesis:

H2a: The announcement of Dieselgate group events is associated with negative ARs for Daimler.

H2b: The announcement of Dieselgate group events is associated with negative ARs for BMW.

H2c: The announcement of Dieselgate group events is associated with negative ARs for the group of car manufacturers (Daimler, BMW, and VW).

Methodology

Event study methodology

According to Fama (1970), in conditions of semi-strong information efficiency, stock prices adjust to the announcement of publicly available, relevant information (e.g. stock split announcements (Fama et al., 1969)). Exploiting this information efficiency to test our research hypotheses, we apply event study methodology (Brown and Warner, 1985; MacKinlay, 1997) based on daily stock returns (Brown and Warner, 1980).

In line with the underlying hypotheses, we divide this study into two parts; the first represents the event study on VW based on individual events (H1) and the second represents the event study on Daimler (H2a), BMW (H2b), and the group of car manufacturers (H2c) based on group events. We apply the event study methodology proposed by MacKinlay (1997) and accordingly define event windows, estimate normal stock returns, calculate ARs, and test statistical significance.

We first calculate stock returns for the market index and the firms based on the stock prices using the following formula:

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}} \tag{1}$$

where R_{it} represents the stock return for i on day t and P_{it} represents the stock price of i on day t. To estimate the expected stock returns, we employ the widely-used market model using the broad German "Prime All Share" index as the underlying market:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{2}$$

where $E(R_{it})$ represents the expected stock return for i on day t, R_{mt} the market return on day t, β_i the beta factor (risk), and ε_{it} the disturbance term. As proposed by (MacKinlay, 1997b), the estimation window ranges from -120 to -21 days before the event date. To assure the

robustness of our findings, we include six event windows in the calculation to obtain robust results, two to capture short-term effects [-1, +1 and -3, +3], two to capture long-term effects [-10, +10 and -20, +20], one to capture any potential information leakage [-10, -1], and another to capture any potential lagged effect [+1, +10]. Next, we calculate the ARs with the following formula:

$$AR_{it} = R_{it} - E(R_{it}) \tag{3}$$

where AR_{it} refers to the AR for i on day t. The ARs, being the residuals between expected and realized stock returns, display returns that one cannot explain using the market model and, thus are a result of the event announcement (Martin Curran and Moran, 2007). Then, we accumulate these ARs over multiple days to produce cumulative abnormal returns (CARs) for evaluating the time series for i using the following equation with t_1, t_2 being the event window boundaries:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it} \tag{4}$$

Cumulative abnormal portfolio returns (CAPRs) enable conclusions on the average effect of an event on the examined portfolio. Therefore, we compound each security's ARs within the regarded portfolio and calculate their mean (Kothari and Warner, 2007):

$$CAPR_t = \frac{1}{N}\sum_{i=1}^{N} CAR_t \tag{5}$$

where $CAPR_t$ refers to the CAPRs and N to the number of securities within the portfolio. We use this portfolio technique, treating the portfolio as a single security, in the upcoming analysis to evaluate the impact of Dieselgate events on the aggregated, average stock returns of VW, Daimler, and BMW. It allows us to conclude whether, on average, investing in this portfolio was economically useful and, thus, on how the events affect the portfolio stock returns. To derive an indication of the absolute change in stock value, we multiply ARs by respective

market capitalizations on the event date. For the portfolio analysis, we use the average portfolio market capitalization to calculate the absolute ARs.

We test the CARs for statistical significance using parametric and non-parametric test statistics. To overcome the over-rejection of the null hypothesis due to event-induced variance and cross-sectional correlation, we employ the t-statistic by Boehmer et al. (1991) adjusted by Kolari and Pynnönen (2010). For non-parametric testing, we apply the generalized rank test by Kolari and Pynnönen (2011), which offers advantages in testing aggregate data (such as CARs) as it is robust against the autocorrelation of ARs and event-induced volatility.

Data and event description

For this study, we obtain stock price and market capitalization data for the German "Prime All Share" index, VW, Daimler, and BMW from Thompson Reuters' Eikon. We select Daimler and BMW as they represent VW's major industry peers in Germany which are listed on the same stock exchange.

We hand-collect event data using the continuous Dieselgate chronicle published in the most important German business newspaper Handelsblatt (Handelsblatt, 2019a). We select events from the presented timeline based on their potential financial impact. To obtain an indication of the impact of an event, we look at how meaningful media portrays the respective events as media portrayal plays an important role in the public perception of corporate scandals (Carberry et al., 2018; Clemente and Gabbioneta, 2017; Xu et al., 2016). Our event selection follows the premise: we select those events for our analysis, which have the potential to affect automotive sales figures (e.g., diesel vehicle bans) or directly diminish the available cash flow (e.g., penalty fines). Then, we use the publishing dates of the articles as the announcement date for each corresponding event. We cross-check these publishing dates concerning potential prior publishing by other media sources to ensure the use of the earliest announcement date for this event study. For all selected events, we find the earliest publication date in the Handelsblatt.

Furthermore, we check all events for the existence of confounding events in Google and Google News in the respective event windows to avoid ARs driven by other events taking place at the same time (Dyckman et al., 1984). In general, we only select events which do not confound with other events. Only for one event for VW (ID 4), we detect a confounding event that we identify as such in the results section. In total, we identify 10 events meaningful enough for this study, which we assign to two event panels (A/B) according to their implications; event panel A contains the individual events relevant to VW (H1), and panel B the group events (H2a/H2b/H2c). Each panel consists of six events. We employ the first two Dieselgate events (IDs 1 and 2) for both analyses, even though they only refer to VW, as they represent the primary events, providing potential conclusions on the immediate contagion effect of Dieselgate. We provide event IDs to facilitate the readability of upcoming findings tables in the next section. Table 1 depicts the event data.

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Results

H1: The effects on Volkswagen's stock

For VW, we report strong, negative ARs for the first Dieselgate event (EPA announcement) in Table 2, which are significant on a 1% level for most of the event window specifications using parametric and non-parametric test statistics: the CARs range between -18.02% [-1, +1] to -38.56% [+1, +10]. That the largest market reaction occurs in the [+1, +10] event window shows that most of the stock selling happened with a time lag. At the same time, findings for the [-1, -10] specification do not indicate any potential information leakage. Based on VW's market capitalization on the event date, CARs are equivalent to an absolute, abnormal loss in market value of EUR -13.9 billion to EUR -29.7 billion, illustrating the tremendous financial impact of the announcement event. Thus, our findings for VW are in line with prior event studies on

Dieselgate (Barth et al., 2017; Griffin and Lont, 2018; Nunes and Park, 2016; Wood et al., 2018). However, the additional analysis of subsequent Dieselgate events following the EPA announcement did not yield any significant results, indicating that these events are not relevant for VW. Despite their financial implications, neither the penalty fee announcements (IDs 3 and 9) nor the announcement that the fraudulent software represents a material defect (ID 10) lead to any abnormal stock returns. According to Bhattacharya et al. (2000), this surprising finding may have different reasons: markets may be inefficient; markets are efficient but the news is not value-relevant; or markets are efficient and the news is value-relevant but the market already anticipated these events and priced them beforehand. As the market processes the information of the Dieselgate announcement and reacts accordingly, the non-efficient hypothesis does not appear to be fully convincing. Based on the potential financial losses for VW, we assume that these events certainly are value-relevant. Thus, we conjecture that the market was able to anticipate Dieselgate's having legal, financially damaging consequences for VW. Accordingly, the market instantly priced the subsequent events with the Dieselgate announcement. We conjecture that investors were able to anticipate the consequences of Dieselgate as it does not represent the first EPA enforcement in consequence of using a defeat device in the US, making the fallout for VW predictable. The immediate, heavy sale of VW's stocks supports this argument. Concerning our H1, we conclude that the majority of events do not result in any significant findings. Still, we cannot fully reject the H1, as the EPA announcement leads to significant, negative ARs. The announcement of good sales figures (Weinzierl, 2017) in the event window [+1, +10] of event 4 is, most likely, responsible for the positive ARs.

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H2a-b: The industry peer contagion effect

Table 3 depicts the results of the industry peer analysis. The stock reaction for Daimler illustrates an immediate stock selling with the Dieselgate announcement. For the announcement event (ID 1), Daimler experiences significant ARs in the amount of -8.42% for the [-3, +3] event window specification, representing an absolute loss in market value of EUR -6.5 billion. The announcement that VW faces a penalty fine in the US (ID 2) generates even greater abnormal stock losses, which are significant at the 5% level for the [-3, +3] event window specification. Significant losses range between -11.39% (EUR -9.0 billion) and -12.59% (EUR -9.9 billion) over the different event windows. Despite both of these events seemingly targeting VW alone, this shows an immediate contagion effect on Daimler. For the first group event, the statement by the EU that diesel engines are not sustainable in the long run (ID 5), Daimler again experiences major negative ARs, which are even significant at the 1% level for the [-3, +3] event window specification. Once again, we identify a range of CARs from -3.09% (EUR -2.2 billion) to -7.77% (EUR -6.8 billion). While the announcement of diesel vehicle bans in German cities (ID 6) does not have any significant impact on Daimler's stock, the legal approval of vehicle bans by the German federal administrative court (ID 7) has the greatest impact of all group events. We find highly significant abnormal stock returns in the amount of -17.42% (EUR -13.1 billion) for Daimler for the long-term event window [-20, +20], which holds across variation in event window specification. Finally, the EU lawsuit announcement against Germany for exceeding legal thresholds of NO_x emissions (ID 8) has a significant impact on Daimler's stock: for the event window [+1, +10], we find a lagged stock loss of -8.48% (EUR -6.2 billion). Concluding the analysis of Daimler, both primary, as well as three out of four group events, generated strong, statistically significant, negative ARs, illustrating that Dieselgate harmed Daimler's market value immensely. Unlike with VW, the market was not able to anticipate the group events and their implications for Daimler, allowing investors to sell

Daimler's stock continuously with the emergence of new, relevant information. Thus, we can mainly confirm our H2a.

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The analysis of BMW's stock returns provides a similar picture although there are a few differences. While the Dieselgate revelation event (ID 1) does not generate any significant ARs for BMW, the second Dieselgate event (ID 2, US penalty fee announcement) has a meaningful impact on its stock returns. Despite the information leakage window specification [-10, -1], all event window specifications lead to statistically significant ARs ranging from -6.29% (EUR -3.7 billion) to -27.42% (EUR -16.3 billion). Thereby, ARs for the [-3, +3] event window are significant at the 1% level. Comparing this finding to Daimler, we can conclude that Dieselgate contaminated BMW at a later stage as the announcement event (ID1) already affected Daimler. However, the impact of the US penalty fee announcement (ID 2) is even greater for BMW than for Daimler. The next difference is that the EU statement on the future of diesel engines (ID 5) does not affect BMW's stock significantly while Daimler is affected strongly. Like Daimler, the announcement of diesel vehicle bans in German cities (ID 6) does not affect BMW. However, with the legal approval of diesel vehicle bans by the German federal administrative court (ID 7), BMW's stock loses between -3.89% (EUR -2.2 billion) and -14.57% (EUR -8.31 billion) in value depending on the event window specification. Finally, the announcement of the EU lawsuit against Germany for exceeding the legal thresholds on NO_x emissions (ID 8) has a highly significant impact on the stock returns of BMW. The loss ranges between -3.86% (EUR -2.3 billion) and -9.13% (EUR -6.17 billion), while most of the stock losses occur with a time lag [+1, +10]. Similar to Daimler, the analysis of BMW provides evidence that the Dieselgate events spilled over and contaminated its stock returns. BMW shows major, statistically significant stock losses for the majority of Dieselgate events. However, compared to Daimler, BMW does not experience abnormal losses for event IDs 1 and 5, which

demonstrates that Dieselgate affected BMW to a lesser extent. These differences in stock market reactions might be due to Daimler and VW sharing more similarities concerning their business models: both manufacturers offer commercial vehicles such as trucks, buses, and vans in their product portfolio, which are usually highly reliant on diesel fuel. For both firms, commercial vehicles take a major part of the sales figures (Daimler Group, 2019; Volkswagen Group, 2019), making their sales more exposed to any threats to the sustainability of diesel engines. BMW, however, is not present in the commercial car business and focuses on private transportation (BMW Group, 2019), which is less reliant on diesel technology. Accordingly, the contagion effect of Dieselgate on Daimler is stronger than on BMW. Nevertheless, the significant CARs for BMW are comparable to those of Daimler. Regarding our H2b, the majority of events led to significant results in the individual contagion effect analysis of BMW. Therefore, we are mainly able to confirm our H2b.

H2c: The group effect

Table 3 depicts the results of the group analysis. Using the Dieselgate group events in the event study on the portfolio's stock returns provides a similar, value-destructive picture. For the announcement by the EPA (ID 1), the portfolio experiences large, highly significant, negative ARs. Losses range between -8.20% and -17.43% and most of the stock selling occurs with a time lag. The application of the CAPRs on the average market capitalization of the portfolio allows the derivation of absolute stock losses in the range of EUR -5.7 billion to EUR -12.2 billion. Thus, the announcement of Dieselgate instantly affected the portfolio. The US penalty fee announcement (ID 2) again has a severe impact on the portfolio stock returns. Yielding large, statistically significant CAPRs of -12.69% to -13.16%, the penalty fee event wipes out market value of the portfolio in the range of EUR -8.7 billion to EUR -9.0 billion. Thus, both VW related events have a severe average impact on the stock returns of the whole portfolio, highlighting the immediate contagion effect on the overall automotive industry. The EU

statement on the future of diesel engines (ID 5) triggers abnormal losses of -4.69% (EUR -3.1 billion) for the [-3, +3] event window, which, however, are only significant at the 10% level. Similar to the individually conducted analyses of Daimler and BMW, the announcement of diesel vehicle bans in German cities (ID 6) does not generate any significant results. However, their legal approval (ID 7) leads to large, highly significant stock losses for a variety of event windows. Ranging between -5.12% and -19.60%, CAPRs increase in line with the size of the event window. In its broadest specification [-20, +20], market value falls by up to EUR -14.1 billion. Finally, the announcement of the EU lawsuit against Germany (ID 8) is again of value-relevance for the portfolio and led to CAPRs of -8.05%, significant at the 5% level, thereby representing an absolute loss in market value of EUR -5.9 billion. Concluding, we can mainly confirm our H2c as, similar to the individual analyses of Daimler and BMW, most of the events lead to significant, negative ARs for the portfolio, illustrating the average financial damage to the German automotive industry by Dieselgate. Hence, both of our contagion effect analyses demonstrate that most of our identified Dieselgate events cause a contagion effect from VW to the German industry peers.

Discussion

Research contributions

Concerning our research question: "How do Dieselgate announcements affect the stock returns of VW and its industry peers (contagion effect)?", the results of our event study on VW display large, statistically significant, negative ARs for the first Dieselgate event whereas all the subsequent events remain statistically insignificant (H1). In the contagion effect analysis (H2a-c), the majority of the Dieselgate group events yield significant, negative ARs for Daimler and BMW on an individual level as well as for the portfolio. By that, the findings illustrate that the financial impact of Dieselgate expresses itself in a value-destructive intra-industry contagion

effect rather than in an individual stock selling of VW. Both analyses demonstrated that Dieselgate events wiped out up to EUR 29.7b in market value (Figure 2).

Our findings come with four major research contributions: First, we add a horizontal contagion effect dimension to the extensive knowledge on contagion effects of Dieselgate, which mostly covers the vertical dimension (Nunes & Park, 2016). We demonstrate that investors immediately target industry peers with the stock selling as a consequence of the scandal (horizontal contagion effect). The multitude of significant ARs suggests that processual scandals like Dieselgate imply continuous contamination of industry peers as the investors follow the ties in the industry and react accordingly. At the same time, VW's single stock selling for the EPA announcement provides the opposite picture and demonstrates that the market can anticipate the consequences for VW right from the beginning of the scandal.

--- PLEASE INSERT FIGURE 2 ABOUT HERE ---

Second, we demonstrate that subsequent events of a corporate scandal matter as well. While several authors analyze the spillover effects of Dieselgate (Barth et al., 2017; Griffin and Lont, 2018; Nunes and Park, 2016), they limit their event studies to the primary event of the scandal – assuming that Dieselgate has ended with this event. The case of Dieselgate illustrates that the EPA announcement is a triggering, rather than a single event, followed by a general questioning of the diesel engine and a chain of subsequent Dieselgate events in Germany. Thus, considering multiple events (a longer timeline) and data on industry peers in the analysis of major corporate scandals can yield more extensive results which would remain overlooked by limiting the analysis to the primary event and the violating firm.

Third, we combine existing theoretical frameworks for understanding the stock market reaction to opportunistic corporate scandals and the resulting contagion effect. Our framework considers two complementary theories building on information asymmetries. Major,

opportunistic corporate scandals like Dieselgate have their source in an existing agency conflict and management control systems that lack a sustainability perspective (Lueg and Radlach, 2016). This combination manifests itself in incentives for moral hazard (Eisenhardt, 1989). Thereafter, the management exploits information asymmetries at the expense of the principal, acts unethically (e.g. by violating environmental regulations), and, thus, obtains a business advantage ultimately resulting in higher management compensation (Li et al., 2018). This agency conflict cannot be limited to a pure shareholder-management relationship but rather has to be extended to a stakeholder-agency approach (Hill and Jones, 1992). Dieselgate affects several stakeholders negatively, which leads to pressure on VW's stocks. The emergence of Dieselgate comes with a passive release of information on environmental risks to the stakeholders (Lueg et al., 2019; Zou et al., 2015a), which enhances a learning process at the investors and triggers the financial contagion effect.

Fourth, our findings suggest that being 'guilty by association' pronounces when firms are interwoven and have many similarities in their business models.

Practical contributions

For practitioners, our analyses provide two important insights into the business advantages from environmental violations and the financial impacts once they are uncovered.

First, we show that violating environmental regulations for business purposes might not have the potential for a significant negative financial impact. VW's environmental violation helped it to penetrate the US market effectively. However, when fraud in these dimensions is the driver for this success, downsides can be high. Dieselgate illustrates that these scandals not only damage the fraudulent firm(s) but also the reputation of industry peers with financially damaging consequences (Zou et al., 2015b). Therefore, VW and the German automotive industry serve as a good example that complying with environmental regulations matters and that violating them is costly. Hence, as pointed out by Dasgupta et al. (2001), stock markets

provide financial incentives for firms to act in an environmentally conscious way and to avoid pollution, making stock markets a functioning external corporate governance mechanism for environmental compliance (Lueg et al., 2015; Velte et al., 2020).

Second, this analysis shows that industry peers might be 'dragged along' by corporate scandals when they cannot effectively differentiate themselves from the fraudulent firm or are not perceived as separate by stakeholders, basically confirming our signaling-based assumption in the background section. Even though Dieselgate affected Daimler and BMW heavily, BMW was able to avoid some of the stock selling due to its greater differences from VW's business model. Thus, firms have to consider that the more similar they become to their competition (e.g., by operating the same business model) and the stronger the interlinkage between them is, the higher the probability will be that an industry peer's scandal will affect them. This, in the second step, implies the contagion effect whereby related industry peers might even suffer stronger financially damaging consequences than the fraudulent firm. Therefore, firms should avoid extensive overlaps in business models and interrelations to assure an effective differentiation should an industry peer be involved in a devastating corporate scandal. A differentiation by explicitly stipulating the environmentally responsible principles in corporate strategy might be a good mean to protect oneself from the scandal-driven contagion effect (Lueg et al., 2016). Thus, the case of Dieselgate provides important lessons for firms regardless of the industry and illustrates that violating environmental regulations to obtain business advantages should be omitted by firms as legal and financial consequences can be devastating. The violating firm, as well as its industry peers, might have to deal with a long-term reputational loss that has the potential to transform formerly highly reputable firms into despised entities in society.

Limitations and future research

The interpretation of our findings is subject to five limitations: These include the limited generalizability to other scandals, our theoretical framework, the potential bias arising from the interdependence of German car manufacturers and the involvement of Daimler and BMW in the Dieselgate scandal, the circumstance that our subsequent events do not represent surprises to market participants, and the negligence of long-term effects as well as investor characteristics.

First, it is questionable whether one can apply our findings to other cases in which the fraudulent firm has rather unrelated industry peers, distinct stakeholders, and in which they serve different customer needs (i.e., different business models). As pointed out, we derived our findings using German car manufacturers in the analysis of Dieselgate, which are deeply interrelated, have a large overlap in stakeholders, and many similarities with regard to organizational type, market positioning, etc. Thus, we conjecture that one can generalize our findings but only to firms with similar business models.

Second, we employ an information economics perspective (agency and signaling) in the analysis of Dieselgate. Our underlying theories, building on how Dieselgate revealed environmental risks to the stakeholders, are able to provide a theoretical explanation for the stock market reaction to VW and the contagion effect. However, diminished legitimacy might be the pivotal issue in other scandals e.g., in the fashion industry (Lueg et al., 2015). As shown by Jonsson et al. (2009), corporate scandals imply legitimacy losses for the firm involved, which eventually spill over to industry peers when the firms are similar but not necessarily interrelated. Hence, a legitimacy theoretical lens might be more suitable to explain the 'undeserved losses' when examining the contagion effect of scandals for similar but unrelated firms.

Third, our statistically significant, negative stock returns for the German automotive industry could partially be a consequence of the interdependence of German car manufacturers, and the involvement of Daimler and BMW in Dieselgate itself. In our analyses, we stick to the legal perspective that all three car manufacturers are independent, legal entities. From a business administration perspective, one might argue that the long-term cooperation between German car manufacturers (Barthel et al., 2015), blurs the legal boundaries and reveals discernible interdependence. This might – partly – explain the contagion effect as VW's problems automatically become a problem for the German industry peers through interdependence. Besides, legal authorities later found other German car manufacturing firms guilty of violating environmental regulations. This is truer for Daimler (Delamaide, 2018) than for BMW (Handelsblatt, 2019b), although both are subject to legal prosecution for irregularities with their diesel vehicles. Thus, the involvement of both firms in Dieselgate might have implications for our findings on the contagion effect. However, we favor the interpretation that a substantial part of the contagion effect is rather built on the 'guilty by association' effect: the individual analyses of BMW and Daimler reveal that both firms were immediately targeted for the first two Dieselgate events when, at that time, nobody associated them with the scandal. Furthermore, we checked that none of the allegations against Daimler and BMW took place at the same time as any of our defined events. Hence, we conjecture that the risk of a bias coming from scandal involvement is relatively small.

Fourth, following the premise of market efficiency strictly, one might argue that our subsequent events do not hold any new information and that considering them is thus unnecessary. However, we counterargue that, indeed, these events do not represent real surprises as media already portrayed them and they followed the initial announcement, still our findings provide evidence that investors, in line with our learning argument, had problems to fully grasp the potential consequences for their firms right from the beginning. This, most

likely, led them to rethink their investment decision over time as they could not evaluate their risk of being dragged along upfront. Hence, we strongly argue that our subsequent events are necessary for the analysis of Dieselgate.

Fifth, we critically assess that we limit ourselves to short-term effects and do not examine the potential recovery following the financial fallout for VW and its industry peers. Finally, we do not distinguish between different groups of investors and assume homogeneity. Future research should clarify how VW and other automotive firms performed in the long run following Dieselgate and if different investor groups reacted differently to the scandal.

Conclusion

Based on 10 identified Dieselgate related events, we examine the impact of Dieselgate on the stock returns of German car manufacturers to understand how Dieselgate affects the stock returns of VW and other German car manufacturers (contagion effect). The analysis reveals that the financial impact of Dieselgate expressed itself in a strong contagion effect rather than in an individual sale of VW's stock. Using the individual analysis of VW to test our H1, we find statistically significant, negative ARs for the revelation event by the EPA (ID 1) while none of the subsequent individual events generated any significant losses. Thus, we partially confirm our H1 as one individual event caused statistically significant, negative ARs for VW.

We apply the analyses of Daimler and BMW individually and of the group of car manufacturers to test our H2a, H2b, and H2c. The results for Daimler demonstrate that, apart from the announcement of diesel vehicle bans (ID 6), all the Dieselgate group events generate significant, abnormal losses for the firm. Despite event IDs 1, 5, and 6, which do not lead to any significant findings, the analysis of BMW provides a similar picture and displays significant stock losses for all the remaining Dieselgate events. Aggregating the stock returns of VW, Daimler, and BMW in the portfolio analysis illustrated that, on average, the portfolio of publicly

listed German car manufacturers suffers significant stock losses for all of the group events except event ID 6. Based on the individual analysis of Daimler and BMW and the group analysis, we mainly confirm our H2a and H2b as the majority of the group events had significant value relevance for Daimler, BMW, and the Group. This finding suggests that Dieselgate's financial impact was far worse for VW's industry peers than for VW itself.

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Tables

Table 1: Event description

Event ID	Event panel	Announcement date	Event	Event description
1	A/B	18.09.2015	Announcement of the scandal	The US-EPA announces VW's fraud publicly.
2	A/B	04.01.2016	US lawsuit announcement	US authorities file suit against VW for violating the US Clean Air Act.
3	A	28.06.2016	Penalty fee announcement in the US	VW has to pay more than 15 billion US dollars in compensation in the US.
4	A	29.12.2016	Class action lawsuit announcement	"My-Right" announces the filing of a class-action lawsuit against VW on behalf of affected individuals in Germany.
5	B	04.04.2017	Negative EU statement on the future of diesel engines	The EU Commission announces a rapid end to diesel engines.
6	B	28.12.2017	Announcement of diesel vehicle bans	The "Deutsche Städtetag" ("The German Association of Cities") demands diesel vehicle bans in highly polluted urban areas to reduce air pollution in cities (although cleaner diesel vehicles which conformed to EURO6 regulation were exempted).
7	B	27.02.2018	Ruling that vehicle bans are legal	Germany's federal administrative court declares bans on diesel vehicles legal.
8	B	17.05.2018	EU lawsuit announcement	The EU files suit against Germany at the European Court of Justice for exceeding the EU limits on nitrogen oxides emissions.
9	A	13.06.2018	Penalty fee announcement in Germany	The court of Braunschweig imposes a penalty fee of 1 billion euros on VW in Germany.
10	A	22.02.2019	Material defect announcement	Germany's federal supreme court declares VW's cheating software to be a material defect.

Table 1 depicts the event data and assigns an event ID to each event. We assign events to event panels according to their implications. We assign events 1 and 2 to both event panels, even though they only refer to VW, as they enable conclusions on how Dieselgate immediately spilled over to VW's industry peers. We obtain the announcement date and the event description from Handelsblatt's Dieselgate chronicle.

Table 2: CARs for VW for the Dieselgate individual events

		[-1, +1]			[-3, +3]			[-10, -1]			[+1, +10]			[-10, +10]			[-20, +20]		
	Event	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**
Volkswagen	1	-18.02%***	(.0000)	(.0000)	-23.43%***	(.0000)	(.0000)	5.74%	(.3415)	(.3415)	-38.56%***	(.0000)	(.0000)	-36.41%***	(.0001)	(.0001)	-14.46 %	(.2969)	(.2969)
	2	-6.49%	(.3036)	(.3036)	-11.79%	(.2316)	(.2316)	6.47%	(.5821)	(.5821)	-9.70%	(.4124)	(.4124)	-6.34%	(.7234)	(.7234)	1.24 %	(.9635)	(.9635)
	3	-3.38%	(.4566)	(.4566)	-6.04%	(.3897)	(.3897)	-7.24%	(.3913)	(.3913)	1.58%	(.8515)	(.8515)	-2.13%	(.8686)	(.8686)	-10.50%	(.5872)	(.5872)
	4	-2.96%	(.1742)	(.1742)	0.68%	(.8400)	(.8400)	2.53%	(.5381)	(.5381)	8.85%**	(.0310)	(.0310)	9.41%	(.1315)	(.1315)	17.70%*	(.0629)	(.0629)
	9	2.16%	(.4853)	(.4853)	-4.81%	(.3185)	(.3185)	-1.60%	(.7840)	(.7840)	-7.96%	(.1842)	(.1842)	-9.13%	(.3057)	(.3057)	-17.60%	(.1887)	(.1887)
	10	2.22%	(.5416)	(.5416)	5.67%	(.3174)	(.3174)	2.29%	(.7417)	(.7417)	-7.95%	(.7004)	(.7004)	-5.49%	(.7939)	(.7939)	-7.66 %	(.7374)	(.7374)

Table 2 illustrates VW's CARs for multiple event window specifications generated by the Dieselgate individual events. We accumulate ARs over the defined event windows to generate the respective CARs (first column of each event window). We employ two test statistics for significance testing. KP represents the parametric t-test by Boehmer et al. (1991) adjusted by Kolari and Pynnönen (2010). GR represents the non-parametric generalized rank test by Kolari and Pynnönen (2011). The p-values (second and third column of each event window) are stated in parentheses and ***, ** as well as * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 3: CARs for Daimler, BMW, and the group for the Dieselgate group events

		[-1, +1]			[-3, +3]			[-10, -1]			[+1, +10]			[-10, +10]			[-20, +20]		
	Event	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**	**CAR**	**KP**	**GR**
Daimler	1	-4.65%	(.1461)	(.1461)	-8.42%*	(.0869)	(.0869)	6.51%	(.2696)	(.2696)	-8.55%	(.1468)	(.1468)	-5.89%	(.5111)	(.5111)	9.03%	(.5046)	(.5046)
	2	-4.50%	(.2197)	(.2197)	-12.59%**	(.0280)	(.0280)	2.13%	(.7557)	(.7557)	-11.39%*	(.0977)	(.0977)	-13.95%	(.1806)	(.1806)	-18.34%	(.2431)	(.2431)
	5	-3.09%*	(.0855)	(.0855)	-7.77%***	(.0055)	(.0055)	-5.37%	(.1137)	(.1137)	-3.33%	(.3287)	(.3287)	-9.38%*	(.0684)	(.0684)	-6.43%	(.4071)	(.4071)
	6	-1.21%	(.4397)	(.4397)	-1.64%	(.4977)	(.4977)	-0.22%	(.9403)	(.9403)	3.13%	(.2897)	(.2897)	2.20%	(.6217)	(.6217)	2.84%	(.6722)	(.6722)
	7	-1.56%	(.2099)	(.2099)	-4.77%**	(.0124)	(.0124)	-2.73%	(.2319)	(.2319)	-5.37%**	(.0184)	(.0184)	-8.33%**	(.0155)	(.0155)	-17.42%***	(.0011)	(.0011)
	8	0.95%	(.6351)	(.6351)	2.70%	(.3855)	(.3855)	1.18%	(.7561)	(.7561)	-8.48%**	(.0248)	(.0248)	-6.33%	(.2696)	(.2696)	-0.38 %	(.9648)	(.9648)
BMW	1	-1.94%	(.5357)	(.5357)	-2.79%	(.5630)	(.5630)	10.42%*	(.0713)	(.0713)	-5.19%	(.3692)	(.3692)	3.12%	(.7223)	(.7223)	19.69%	(.1378)	(.1378)
	2	-6.29%*	(.0786)	(.0786)	-15.11%***	(.0069)	(.0069)	1.28%	(.8472)	(.8472)	-16.99%**	(.0114)	(.0114)	-20.95%**	(.0394)	(.0394)	-27.42%*	(.0737)	(.0737)
	5	-2.99%	(.1584)	(.1584)	-2.68%	(.4163)	(.4163)	0.81%	(.8390)	(.8390)	-1.33%	(.7418)	(.7418)	-1.95%	(.7481)	(.7481)	-4.27%	(.5723)	(.5723)
	6	-1.23%	(.4855)	(.4855)	-1.74%	(.5226)	(.5226)	1.58%	(.6322)	(.6322)	2.17%	(.5139)	(.5139)	3.65%	(.4665)	(.4665)	9.63%	(.2025)	(.2025)
	7	-0.50%	(.7477)	(.7477)	-3.89%*	(.0999)	(.0999)	-0.76%	(.7881)	(.7881)	-5.17%*	(.0673)	(.0673)	-6.80%	(.1110)	(.1110)	-14.57%**	(.0276)	(.0276)
	8	-3.86%**	(.0338)	(.0338)	-2.14%	(.4500)	(.4500)	-0.91%	(.7921)	(.7921)	-9.13%***	(.0078)	(.0078)	-10.17%*	(.0509)	(.0509)	-8.02%	(.3082)	(.3082)
Group	1	-8.20%***	(.0070)	(.0070)	-11.55%**	(.0134)	(.0134)	7.56%	(.1771)	(.1771)	-17.43%***	(.0018)	(.0018)	-13.06%	(.1249)	(.1249)	4.75%	(.7116)	(.7116)
	2	-5.76%	(.1536)	(.1536)	-13.16%**	(.0370)	(.0370)	3.29%	(.6616)	(.6616)	-12.69%*	(.0938)	(.0938)	-13.75%	(.2309)	(.2309)	-14.84%	(.3910)	(.3910)
	5	-2.70%	(.1234)	(.1234)	-4.69%*	(.0857)	(.0857)	-2.37%	(.4747)	(.4747)	-1.12%	(.7355)	(.7355)	-4.32%	(.3897)	(.3897)	-4.27%	(.5723)	(.5723)
	6	-1.24%	(.4556)	(.4556)	-1.84%	(.4735)	(.4735)	-0.30%	(.9237)	(.9237)	2.90%	(.3544)	(.3544)	2.32%	(.6242)	(.6242)	3.76%	(.3507)	(.3507)
	7	-1.61%	(.2891)	(.2891)	-5.12%**	(.0277)	(.0277)	-2.17%	(.4368)	(.4368)	-6.69%**	(.0161)	(.0161)	-9.99%**	(.0174)	(.0174)	-19.60%***	(.0026)	(.0026)
	8	-0.89%	(.6547)	(.6547)	0.78%	(.8022)	(.8022)	-0.93%	(.8054)	(.8054)	-8.05%**	(.0330)	(.0330)	-8.70%	(.1288)	(.1288)	-4.69%	(.5874)	(.5874)

Table 3 illustrates Daimler's, BMW's, and the Group's CARs for multiple event window specifications generated by the Dieselgate group events. We accumulate ARs over the defined event windows to generate the respective CARs (first column of each event window). We employ two test statistics for significance testing (second and third column of each event window). KP represents the parametric t-test by Boehmer et al. (1991) adjusted by Kolari and Pynnönen (2010). GR represents the non-parametric generalized rank test by Kolari and Pynnönen (2011). The p-values (second and third column of each event window) are stated in parentheses and ***, ** as well as * denote statistical significance at the 1, 5, and 10% level, respectively.

Figures

Figure 1: Theoretical Framework

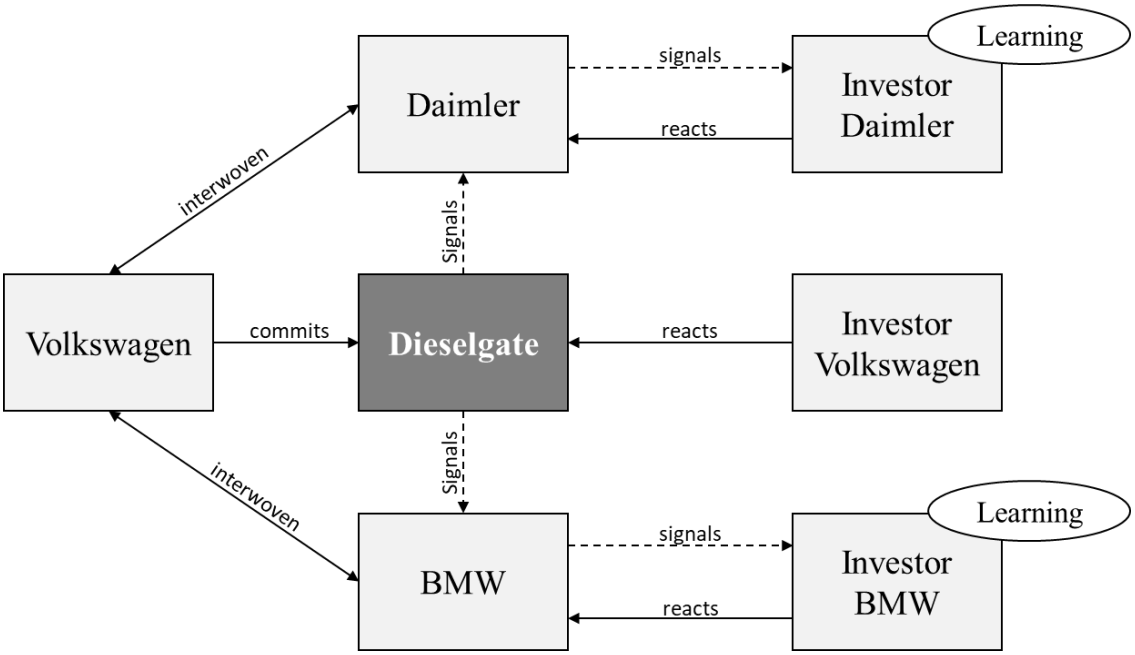

Figure 1 displays our theoretical framework. It illustrates how Volkswagen is interwoven with its industry peers, how Dieselgate passively signaled the risk to the investors of Daimler and BMW and triggered a learning process, which, in turn, led to the sellout of Daimler's and BMW's stocks.

Figure 2: Summary of the findings

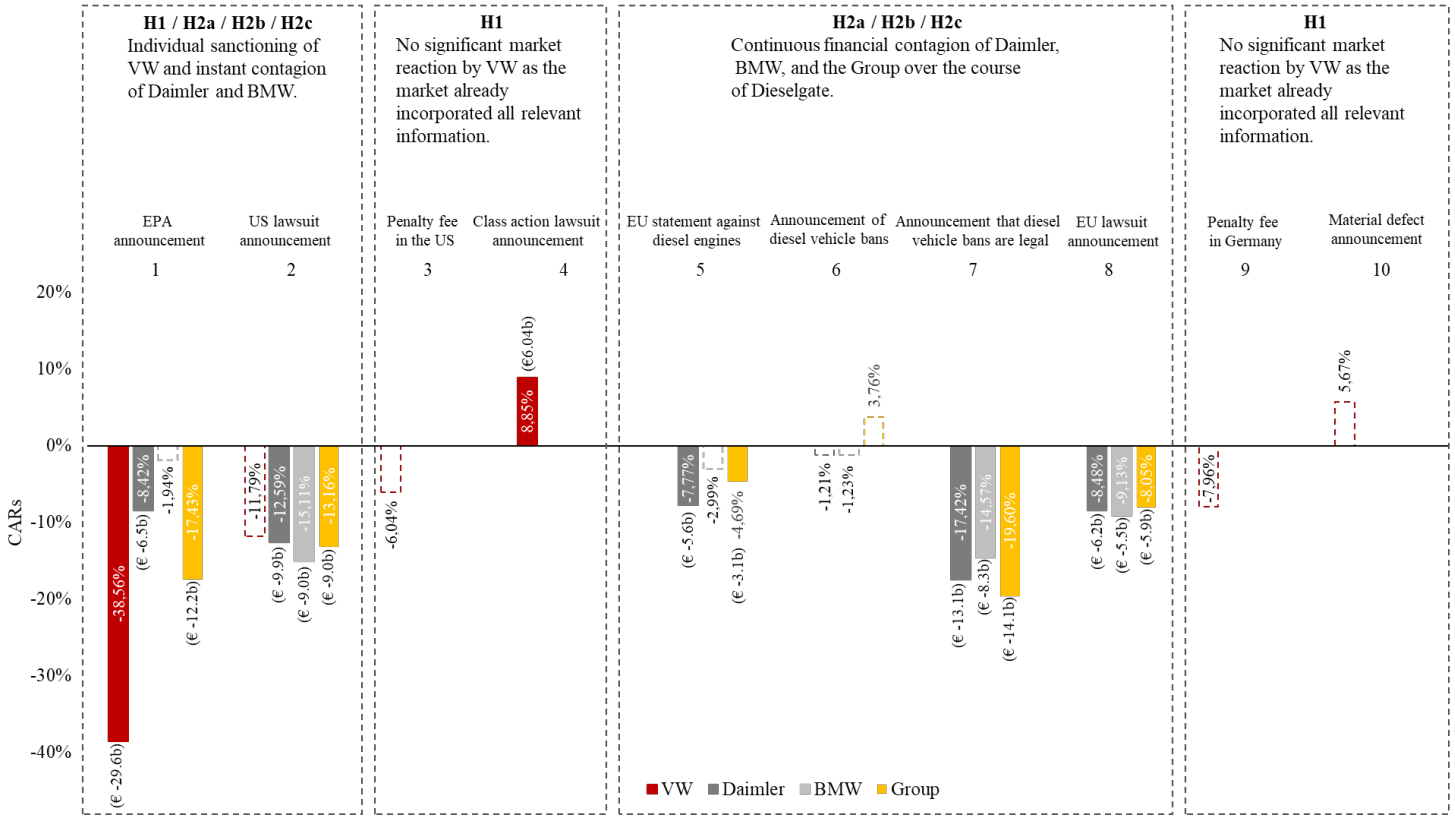

Figure 2 denotes CARs on the y-axis and the events on the x-axis. We display significant CARs centered in colored and filled bars; insignificant CARs in dashed, uncolored bars. For all events and firms, we select the most significant CARs, respectively. For significant CARs, we display the absolute loss in market capitalization in parenthesis below/above each bar. We assign the events to the respective hypotheses and provide a short explanation of the findings.

4 The reputation costs of executive misconduct accusations: A stock market perspective on #MeToo in the US

Abstract

We examine how sexual harassment accusations against executives affect the stock returns of the affiliated organization. Taking an upper echelons and reputation capital perspective, we identify 98 sexual harassment accusations from 2016-2019, of which 25 directly target organizational executives. We employ an event study methodology to detect abnormal stock reactions for the affiliated organization. As predicted, the results indicate that #MeToo accusations substantially harmed the stock returns of the organization despite the accusation relating to the misconduct by an individual. Surprisingly, we discover significant results only for executives who are employed at the parent organization. Therefore, we first provide evidence that misconduct by individuals matters for organizations. Second, we enrich upper echelons literature by focusing on accusations of *executive misconduct*. We demonstrate that executive misconduct becomes particularly relevant when the executive assumes a leading position at the parent organization. This finding comes with important implications for future research and practitioners.

Keywords: #MeToo, Executive misconduct, Sexual harassment, Upper echelons, Abuse of power, Reputation costs, Event study

Introduction

Incidents of misconduct are assumed to have negative implications for the organization (Greve et al., 2010). However, we conjecture that neither the effect itself nor the extent of the effect have been fully demonstrated. Investors may react to misconduct by divesting and thus reducing the stock price (Flammer, 2013).

Investors' reactions to organizational misconduct are receiving increasing academic attention. Relevant research works have investigated unethical events in terms of the potential abnormal negative returns for organizations (i.e., event studies). There is a wide discrepancy in research interest between ecological and governance issues and social issues. Research tends to focus on ecological (Bosch et al., 1998; Dasgupta et al., 2001; Dasgupta et al., 2006; Flammer, 2013; Gupta & Goldar, 2005; Hamilton, 1995; Khanna et al., 1998; Klassen & McLaughlin, 1996; Lanoie et al., 1998; Lundgren & Olsson, 2010; Xu et al., 2012) and governance issues (Beatty et al., 2013; Jonsson et al., 2009; Yu et al., 2015), whereas evidence on social misconduct (Frooman, 1997; Gunthorpe, 1997) by organizations remains scarce. Concerning misconduct by *individuals*, empirical evidence regarding the capital market reaction is even rarer (Song & Han, 2017). Few researchers already dealt with the stock price implications of sexual harassment accusations in the wake of the #MeToo movement and analyzed how prominent accusations affected the stock returns of various organizations that are characterized by either a positive or negative environment toward females (Billings et al., 2019; Lins et al., 2019). We take another perspective on sexual harassment accusations and analyze how the stock returns of organizations are affected that are affiliated with a person targeted by a public accusation.

Sexual harassment incidents are prime examples of individual misconduct and abuse of power within organizations that have recently attracted greater public interest (Carlsen et al., 2018; Griffin et al., 2018; The Creep Sheet, 2020; Vox, 2019). In the wake of the #MeToo

movement, many people have come forward on influential social media platforms, such as Twitter and Facebook, or through conventional media outlets (e.g., New York Times) and have discussed the inappropriate sexual behavior they have experienced. Many of these revelations explicitly implicate leading organizational officials (Berzon et al., 2018; Farrow, 2018). #MeToo evolved as a movement out of a societal shift towards inclusion and gender equality (Gill & Orgad, 2018). In 2006, Tarana Burke, a human rights activist, coined the phrase "me too" on Myspace, a social media platform, and reported her harassment experiences using this phrase (North, 2017). The phrase aimed to encourage other victims of sexual violence to come out with their stories and to demonstrate the magnitude of workplace sexual harassment. Although public complaints against workplace harassment did not receive much attention at that time (MacKinnon, 2019), the movement gained momentum when the first accusations against executives at Fox News (21st Century Fox), a prominent news network, became public and revealed a serious problem of sexual abuse of females in the organization (Puente, 2019). The narrative of sexual harassment had its pinnacle when the New York Times published a seminal criticism revealing numerous sexual harassment accusations against Harvey Weinstein, a film production mogul (Kantor & Twohey, 2017). One of the most famous accusers, actress Alyssa Milano, used the prominence of the accusation against Weinstein to revive the phrase "me too" and encouraged other victims to post their sexual harassment experiences under the hashtag #MeToo (Dorking, 2017). Following the accusations against Weinstein, numerous people tweeted their personal experiences of sexual harassment in the workplace. Many of these tweets targeted organizational executives by name for sexual harassment and the underlying abuse of power. From 2019 on, public #MeToo accusations started to decline drastically compared to the number made in 2017 and 2018. This development might be a consequence of the #MeToo backlash, which potentially discouraged additional people from coming forward with their accusations (Bower, 2019; Dewey, 2019). The emergence of #MeToo also reveals that anti-sexual harassment measures in organizations largely fail since victims have to speak

about their experiences publicly to achieve change in dealing with sexual harassment (Clarke, 2020).

We want to utilize #MeToo as our seminal case to shed light on the question of why investors consider misconduct by individuals in their investment decisions in organizations. The news media provides mixed findings in that regard. MarketWatch predicted that #MeToo would not have any impact on stock performance, as it does not affect organizational profitability, and accusations against individuals in an organization might not impact the organization as a whole. The stability of CBS' stocks, a US-American TV network, to the accusation against Charlie Rose, a prominent TV host and journalist employed at CBS, provides anecdotal evidence of this (Vlastelica, 2017). However, TIME and CNN, US-American news networks, provide opposing evidence when retrospectively examining prominent #MeToo accusations and reporting that Guess, a famous fashion brand, and Wynn Resorts, a developer and operator of high-end hotels and casinos, both experienced substantial negative stock market reactions following accusations against their executives (Cooney, 2018; Wattles & Isidore, 2018). To address this conundrum of when sexual harassment accusations are value-relevant, we pose the following research question:

RQ: How and in which situations do investors react to sexual harassment accusations against executives?

To answer this question, we conduct an event study based on daily stock returns (S. J. Brown & Warner, 1980, 1985; MacKinlay, 1997) on public #MeToo accusations. Drawing on upper echelons theory (Hambrick, 2007; Hambrick & Mason, 1984), we explicitly test accusations against executives since they assume a crucial role in the organization.

Based on our analysis, we detect substantial, negative abnormal stock returns for public announcements of sexual harassment accusations against executives; however, only for those

employed at the parent organization. On this basis, we confirm the upper echelons theoretical perspective highlighting the importance of executives and provide evidence that a strong association between the accused executive and the organization is the precondition for the accusation to affect the organization financially. In these cases, we report significant losses in market value of up to $5.00 billion (relating to Amit Singhal of Google) attributable to the publication of the accusation.[2]

From our findings, we derive two research and two practical contributions. First, we illustrate that an individual's misconduct can cause harm to the organization even though it does not have instant profitability implications. Second, we enrich the upper echelons research and provide the following novel perspective: an executive's social misconduct affects the organization. In practical terms, our findings demonstrate that the consequences of executive sexual misconduct can be substantial. Thereafter, there are not only ethical concerns related to sexual harassment but also financial, highlighting that harassment prevention should play a substantial role in organizational management. First, we recommend that organizations should carefully screen executives regarding their behavior before hiring them. Second, we advise organizations to implement anti-sexual harassment policies that deter executives from engaging in such misconduct next to establishing an environment that allows employees to speak about their concerns with executives without fearing repercussions.

[2]We calculated the loss in market value by multiplying the cumulative abnormal returns for Alphabet (Google) as calculated in Table 4 by the market capitalization on the event date of the accusation.

Theoretical background

An upper echelons perspective on executive misconduct

According to upper echelons theory, an organization reflects its top managers' background characteristics. In particular, the values, experiences, and personal traits of executives affect their strategic choices and impact the organization in terms of performance (Hambrick, 2007; Hambrick & Mason, 1984). Hambrick and Mason (1984) claim that any organizational outcome is a reflection of the *values* and the cognitive basis of the organization's top management.

More recently, Neely et al. (2020) outlined that the organizational influence of executives is being further increased by the ongoing challenges stemming from globalization and digitalization in an increasingly complex world. This raises questions regarding how executives position their organization's role within society and how they interact with different stakeholders (e.g., employees, customers). Therefore, they present business cases in which the values and beliefs of an organization's executives are directly expressed in the organization. This might relate to business-related actions such as the implementation of management practices (Andersen & Lueg, 2017; Burkert & Lueg, 2013; Hiebl, 2014) or the engagement in social affairs (e.g., Uber's actions for reuniting immigrant children with their families in response to Trump administration policies, initiated by Uber CEO Dara Khosrowshahi, who is himself a child of immigrants) by the organization (Neely et al., 2020). However, one might also argue that an executive's unethical personality traits *(i.e., 'unethical' values)* might manifest themselves in the organization as well (van Scotter & Roglio, 2020). Research has revealed that some personality traits of executives might lead them to engage in unethical behavior, such as the delivery of poor accounting quality (i.e., earnings management), accounting fraud (earnings manipulation to meet analysts' forecasts), options backdating, and failure-concealing M&A activities. Furthermore, executives with unethical personal traits are more likely to engage in multiple forms of misconduct, and they do so by establishing a top-

down work culture (‘tone at the top’) that is congruent with the personal (unethical) values. This ‘tone at the top’ then encourages unethical actions within the organization (Biggerstaff et al., 2015; Plöckinger et al., 2016).

While upper echelons research primarily focuses on the role of executive characteristics in implementing management practices, we conjecture that this theoretical framework is also applicable to misconduct such as sexual harassment. Many harassment accusers reported a sexualized and hostile environment in the organization, which was mainly driven by the executive’s behavior (Wind-Fries & Stockmann, 2017). Concerning the classic framework of Hambrick and Mason (1984), harassment would represent a *strategic choice* that characterizes the organizational outcome. Executives affect these outcomes to a higher degree if their job demands and their discretion are high (Hambrick, 2007). Because of their managerial power, executives can shape the organization with their values. Thereby, managerial power describes the ability of managers to exert their will in implementing the strategic choices of their organizations (Carpenter et al., 2004; Finkelstein, 1992; Hambrick, 2007; Lambert et al., 1993). Executives may abuse this power by engaging in (sexual) misconduct as their power allows them to transmit their wills and desires in direct action with little risk of repercussions. We will elaborate on the inherent abuse of power within sexual harassment committed by executives in the next section.

Sexual harassment as a hierarchical abuse of power phenomenon

Power is a necessary element of managing organizations but carries the potential for abuse (Salancik & Pfeffer, 1977). In particular, Vredenburgh and Brender (1998) conceptualize the superior’s hierarchical abuse of power as hierarchical acts meant to disrespect an individual’s dignity and to interfere with subordinates' career prospects. Several accusers within the #MeToo movement reported this behavior. Thereafter, executives exploited their power and their influence to harass subordinates sexually, convinced that this misconduct will be kept secret

due to the victims' fear of damaging their career prospects (Covert, 2017). While this type of abuse is interpersonal and, thus, individual, it might become organizational if the harasser assumes a leading position (Bies, 2001; Cortina et al., 2001; Greve et al., 2010).

One special form of abuse of power is workplace sexual harassment (McLaughlin et al., 2012; Popovich & Warren, 2010). Based on a survey of 100 females, Powell (1983) argues that there is no uniform definition of sexual harassment. Instead, it is the sole privilege of the victim to explicate why they consider a specific interaction to be harassment. Such definitions are not arbitrary, however. Empirically, the survey revealed that there is a broad consensus about what constitutes harassment, including the nonphysical type, such as sexual propositions and inappropriate comments. We will later follow this broad definition by Powell (1983) and consider and all types of sexual harassment in our sample.

According to Bargh and Raymond (1995), power is an essential driver for sexually abusive behavior. The link between power and sex is mentally anchored in abusive superiors, which makes them sexualize situations of power – a trait particularly pronounced in sexual abusers and rapists. According to O'Leary-Kelly et al. (2000), workplace harassment represents a strategic choice with which harassers pursue personal goals. Thereby, these goals might relate to emotional goals (well-being), and instrumental goals that bring benefit to the harasser (sexual arousal, punishment to others due to perceived injustice, self-presentation). Both the pursuit of emotional and instrumental goals and cognitive biases might be the motivators for harassers to engage in sexual misconduct (Bazerman & Moore, 2009). In a distorted manner, harassers might perceive females at work as a violation of the traditional sex-role expectation that requires redistributive correction by "putting female coworkers in their place" through the means of harassment. This view is shared by Lengnick-Hall (1995), who argues that sexual harassment is a direct consequence of the power differential. Thereafter, harassers use harassment as a way of exerting power and reducing the authority of the victim. At the same time, subordinates tend

to accept this behavior due to the power differential and fear of losing career prospects (Folgerø & Fjeldstad, 1995; Hemming, 1985; Uggen & Blackstone, 2004).

This entanglement of superiority, power, and sex in executives creates various impediments for employees and organizations. First, employees targeted by sexual harassment are subject to serious mental health issues and the corresponding excessive consumption of drugs (Richman et al., 1999). Second, on an organizational level, sexual harassment contributes to the development of formal and informal status hierarchies (abusers vs. victims) and social exclusion. This threatens organizational stability, as the excluded employees might see themselves as being forced to leave the organization (Jiang et al., 2015; Lopez et al., 2009). Furthermore, sexual harassment is associated with a negative overall mood (job dissatisfaction), psychosomatic health issues, diminished self-esteem, and cognitive distraction from work, which together lead to a deterioration of employee and, therefore, organizational performance (Barling et al., 1996).

Furthermore, as society condemns behavior that goes against its prevalent norms, such as the right of sexual integrity (Parsons et al., 2018), organizations associated with harassment accusations might be subject to reputation costs. We will elaborate on that in the upcoming section to outline the mechanism of how these sexual harassment accusations translate into stock market losses.

The reputation costs of executive misconduct

Since sexual harassment represents behavior that is despised in society due to its negative consequences for the victims, this behavior might be a source of severe reputation costs (Sampath et al., 2018). According to Karpoff (2014), investors' decisions to sell stocks due to fear of a reputation loss reflect their concerns regarding the prospective consequences for the organization, e.g., customer calls for boycotts, declining sales, deterioration of the credit rating, etc. This view is supported by Murphy et al. (2009), who report a substantial increase in risk

(Lueg et al., 2019), as well as a decline in profitability following organizational misconduct and attribute these performance outcomes to reputation costs. Indeed, reputation is part of its overall stock market valuation and, thus, represents an important intangible asset to organizations (Rindova et al., 2010; Rindova & Martins, 2014). This reputation capital is diminished by misconduct in the form of a stock market penalty (Kang, 2008; Tischer & Hildebrandt, 2014).

Within the scope of organizational misconduct, executive misconduct is particularly relevant in regard to reputation damage (Hall et al., 2004). Lin (2020) argues that organizations and their executives operate in a changing socioeconomic environment in which awareness of misconduct by executives is increasing. Attitudes towards executive sexual abuse of subordinates, long deemed acceptable due to differences in power (Folgerø & Fjeldstad, 1995; Hemming, 1985; Uggen & Blackstone, 2004) and tolerance of such conduct (Reilly et al., 1992), changed drastically in the wake of #MeToo (Gill & Orgad, 2018). This dynamic, together with the increasing importance of executives (Neely et al., 2020), has shifted the focus from the role of the organization to the role of the executive in regard to misconduct. Accordingly, the personality traits of the executive assume an important role and represent an antecedent of organizational misconduct (van Scotter & Roglio, 2020). Therefore, we conjecture that executive sexual harassment damages an organization's reputation.

To synthesize our theoretical constructs, we argue that executive positioning, the underlying abuse of power in the course of sexual harassment, and the consequential reputation loss are reflected in reputation costs, translating into stock market losses. Figure 1 illustrates this interrelation and displays our underlying theoretical framework.

--- PLEASE INSERT FIGURE 1 ABOUT HERE ---

Literature review and hypothesis development

Several authors have provided evidence regarding the stock price reaction to misconduct by executives; however, they focused mainly on issues such as bribery and general white-collar crimes. Long and Rao (1995) examined the capital market reaction to the announcement of bribery, illegal payments, employee discrimination, environmental pollution, and insider trading, many of which refer to actions committed by organizational executives. They report a negative long-term average wealth effect from these events and conclude that unethical acts conflict with the maximization of shareholder value. Deepening the investigation on bribery, Sampath et al. (2018) examined 134 organizations targeted by bribery enforcement and report abnormal stock losses for them. The involvement of an organizational executive in a bribery scandal increases stock losses, which highlights the importance that the capital market attributes to organizational executives. These findings regarding bribery are confirmed by Rao and Brooke Hamilton (1996), who applied a similar methodology and considered white-collar crimes as a differentiation. In line with prior investigations, Tay et al. (2016) examined a wide range of white-collar crimes (i.e., insider trading, market manipulation, submissions of false statements) and report negative, persistent abnormal stock losses for organizations whose executives engaged in these criminal activities. Finally, Song and Han (2017) specifically addressed individual misconduct by executives (white-collar), which they categorized as antitrust violations, bribery, embezzlement, slush fund creation, tax evasion, and trading rule violations. They compared white-collar individual crimes to non-white-collar individual crimes (street crimes) and concluded that executive crimes, on average, lead to larger abnormal stock losses. They motivate this finding with white-collar crime being more associated with the organization itself than street crime, which emphasizes the relevance of executives in the organization. In conclusion, the extant research finds that misconduct by executives is value-relevant. It seems that the capital market does not differentiate whether the act was committed

by an executive or by the organization as a whole. This, in turn, gives relevance to any unethical or illicit acts committed by executives.

Researchers began to provide evidence regarding the stock market reaction to sexual harassment in the wake of #MeToo. Lins et al. (2019) investigated the importance of corporate culture in protecting an organization from the spillover effect of sexual harassment accusation announcements. They revealed that organizations that have females among their five highest-paid employees (female-friendly environment) saw positive abnormal stock returns upon the revelation of the sexual harassment accusations against Weinstein. They attributed this finding to the fact that, in line with our upper echelons argument, having females in top-level positions affects the overall organization, making it robust against potential spillovers driven by investors' fear of their organizations being targeted by #MeToo accusations. Billings et al. (2019) confirm this finding from another perspective. They investigated a large sample of organizations that did not include females on their boards and studied the stock reactions to multiple events on the #MeToo timeline. They report substantial abnormal stock losses concentrated in organizations that traditionally excluded females from their boards, as these organizations are likely to be targeted by a sexual harassment accusation themselves (female-unfriendly environment). Furthermore, they observe positive abnormal stock returns for organizations that embrace the inclusion of females on boards. The findings of both studies ultimately reveal that the organizational environment is largely driven by the executives and that having females on boards and in top-level positions helps organizations to avoid the spillover effect from sexual harassment accusations.

From our theoretical foundation, which reveals the importance executives have in the organization and how their sexually abusive behavior damages the reputation of the organization, the empirical evidence on the impact of executive misconduct, and the initial

evidence on the stock impact of #MeToo accusations, we derive our research hypothesis as follows:

H0: There are no significant abnormal returns for the organization affiliated with the accused executive.
H1: There are significant abnormal returns for the organization affiliated with the accused executive.

Methodology

Event study methodology

To test our hypothesis, we apply the event study methodology proposed by (MacKinlay, 1997). Accordingly, we define event windows, estimate normal stock returns, calculate abnormal returns, and test for statistical significance.

We first calculate stock returns for the organizations based on the stock prices using the following formula:

$$R_{it} = \frac{(P_{it} - P_{it-1})}{P_{it-1}} \quad (1)$$

where R_{it} represents the stock return for i on day t and P_{it} represents the stock price of i on day t. To estimate the expected stock returns, we employ the widely used Fama and French (1992) three-factor model, which outperforms the common market model (Fama & French, 1993) and is calculated as follows:

$$E(R_{it}) = a_i + b_i(R_{mt} - R_{ft}) + S_i SMB + h_i HML + \varepsilon_{it} \quad (2)$$

where $E(R_{it})$ represents the expected stock return for i on day t, $(R_{mt} - R_{ft})$ is the market risk premium on day t, SMB $(small\ minus\ big)$ is the difference in returns between small and large stock portfolios, HML $(high\ minus\ low)$ is the difference in returns between stocks with

high and low market-to-book ratios, and ε_{it} is the disturbance term for i on day t. By including the market risk premium in the estimation, we also better adjust for potential issues coming from event clustering compared to mean-adjusted models (Brown & Warner, 1985). As proposed by (MacKinlay, 1997), the estimation window ranges from -120 to -21 days before the event date. To ensure the robustness of our findings and the inclusion of the relevant event date, we include three event windows in the calculation [-1, +1; -3, +3; -5, +5]. Thus, we ensure that any potential leakage (McWilliams & Siegel, 1997) and delayed (investor learning) effects (Bebchuk et al., 2013; Bouzzine & Lueg, 2020) are captured. Next, we calculate the abnormal returns with the following formula:

$$AR_{it} = R_{it} - E(R_{it}) \tag{3}$$

where AR_{it} refers to the abnormal returns for i on day t. The abnormal returns, which are the residuals between the expected and realized stock returns, display returns that one cannot explain using the Fama and French (1992) three-factor model and thus are a result of the event announcement. Then, we accumulate these abnormal returns over multiple days to produce cumulative abnormal returns (CARs) for evaluating the time series for i using the following equation, with t_1, t_2 being the event window boundaries, as follows:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it} \tag{4}$$

The cumulative average abnormal returns (CAARs) enable conclusions to be drawn on the average effect of an event on the examined stock portfolio. Therefore, we compound each security's abnormal returns within the regarded portfolio and calculate the mean as follows (Kothari & Warner, 2007):

$$CAAR_t = \frac{1}{N}\sum_{i=1}^{N} CAR_t \quad (5)$$

where $CAAR_t$ refers to the CAARs and N to the number of securities within the portfolio. We use this portfolio technique, treating the portfolio as a single security, in the upcoming analysis to evaluate the impact of #MeToo accusation events on aggregated groups of organizations. It allows us to conclude whether, on average, investing in this portfolio was economically useful and, thus, how the events affect the portfolio's stock returns.

We test the CARs for statistical significance using parametric and nonparametric test statistics. To overcome the common issue of overrejecting the null hypothesis due to event-induced variance and cross-sectional correlation, we employ the t-statistic of Boehmer et al. (1991) adjusted by Kolari and Pynnönen (2010). As stock data frequently violate the normality assumption necessary for parametric testing, we check our hypothesis testing with nonparametric tests. To this end, we apply the generalized rank test by Kolari and Pynnönen (2011), which offers advantages in testing aggregate data (such as CARs) since it is robust against the autocorrelation of abnormal returns and event-induced volatility.

Data collection and description

To conduct the event study on #MeToo accusations, we hand-collected accusations from different media sources. Our major source is The Creep Sheet (2020), a comprehensive list of public figures accused of sexual harassment grouped by industry categories in which the accusation took place (academia, art, business, entertainment, fashion, food, literature, media, music, nonprofit and philanthropy, politics and government, religion, sports, technology, and theater). Out of these categories, we consider business, entertainment, fashion, media, and technology for our analysis, as they are the categories for which affiliation to a listed organization is most likely, a necessary condition for our analysis. We enriched these accusations by considering further media sources, such as Vox (2019) and The New York

Times (Carlsen et al., 2018), among others, in our sample and attributed these accusations to the industry categories by The Creep Sheet we have considered in our analysis (*business, entertainment, fashion, media, and technology)*. Thereby, in line with the efficient market hypothesis suggesting immediate market reactions to new information (Fama et al., 1969), we select the earliest article that specifically addresses an accusation as our source and do not consider subsequent events. In total, we obtained 372 accusations from 1989 – 2019. Following the accusations against Weinstein and with the emergence of the #MeToo hashtag on Twitter, harassment accusations increased disproportionally (Dastagir, 2019). Figure 2 illustrates this development in our dataset.

--- PLEASE INSERT FIGURE 2 ABOUT HERE ---

For all of the accused persons, if not stated in the article, we investigated whether there is an organizational affiliation, whether the organization is listed on a US stock exchange, and whether it was listed when the accusation emerged. These are all preconditions for the accusations to be considered in our analysis. Then, we only include accusations that followed the accusation against Roger Ailes (21 July 2016), as this represents the first accusation that received substantial media attention and was the beginning of a chain of sexual harassment accusations against 21st Century Fox officials. Table 1 displays how these restrictions reduce our research sample from 372 to 98 accusations from 2016 - 2019, and Table 2 displays the sample's distribution by categories and sex[3].

--- PLEASE INSERT TABLES 1 AND 2 ABOUT HERE ---

Table 2 highlights that our accusations mainly cluster in the media and entertainment category. We obtained stock data for the affiliated organizations from Thomson Reuters Eikon and the data for the Fama and French (1992) three-factor model from Kenneth French's database for

[3] A detailed overview of all 98 accusations is provided in Appendix A.

US stock returns (French, 2020). We further distinguish the affiliated organizations in terms of whether they represent subsidiaries of listed US organizations or the listed parent organization itself. Finally, we differentiate the accused persons by whether they represent executives or not, and if they are executives at the parental organization or a subsidiary. To this end, an executive represents a person who has power over subordinates, can make decisions regarding employment, and has a leading position in the organization (Robertson, 2020). We further divide our research sample of 98 accusations into subsamples to derive conclusions on whether the employment characteristics are relevant to the stock market. Out of our sample of 98 accused persons, 42 are employed at the parent firms and 56 are not, 25 represent executives and 73 do not, and 14 represent executives at the parent firm and 84 do not (Table 3). As the focus of this study is on accusations against executives, we specifically examine these 25 accusations. The classification outlined in Table 3 is later used in the robustness check section to compare the event study results for these subgroups with each other.

--- PLEASE INSERT TABLE 3 ABOUT HERE ---

Results

Results for accusations against executives

Table 4 displays our event study results for accusations against executives. As outlined in Table 3, these refer to 25 persons, 14 of which are directly employed at the parent organization and not at a subsidiary.

--- PLEASE INSERT TABLE 4 ABOUT HERE ---

In line with our theoretical framework, we observe a significant negative market reaction. Substantial negative CARs are reported for several executives, which provides support for rejecting H0. However, the findings are mixed; for some executives, no significant reactions can be observed at all, while for others, a substantially negative reaction is the consequence. By

examining the employment characteristics of the executive, it appears that significant negative reactions are pronounced when the executive is employed at the parent organization. For instance, the accusation against Jason Mojica, a former chief executive at Vice Media, a digital media and broadcasting organization, did not lead to any abnormal stock reactions for the parent organization The Walt Disney Company, a mass media and entertainment conglomerate. The same is true in the case of Roy Price, a former executive at Amazon Studios, a television and film producer, distributor, and subsidiary of Amazon.com, a multinational technology organization. On the other hand, accusations against executives at parent organizations triggered substantial abnormal stock losses between -2.00% (Amit Singhal, Alphabet) and -22.63% (Paul Marciano, Guess). Thus, we conjecture that investors' decision to sell a stock that is associated with #MeToo depends on whether the accused person holds a leading position in the parent organization. In cases of employment at the parent organization, investors fear that the misconduct of the executive will lead to a reputation spillover from the individual to the overall organization. Initial evidence of interorganizational misconduct spillover has already been reported for similar organizations (Jonsson et al., 2009), organizations in the same industry (Zou et al., 2015), organizations belonging to the same conglomerate (Haack et al., 2014), and organizations operating similar business models (Bouzzine & Lueg, 2020b). However, contradicting this pattern of parent organization employment, the findings regarding Michael Ferro (Tribune Publishing) and Nick Caporella (National Beverage) did not reveal any abnormal stock losses even though both were executives at the parent organization.

Still, our findings provide evidence on how sexual harassment accusations against an executive affect the organization and allow us to reject H0 and to argue in favor of H1.

Robustness check

To check whether our findings regarding the executives are robust, we aggregate the CARs cross-sectionally (CAARs) and compare the findings for the overall sample (N=98), for people employed at the parent organization (N=42), for the executives (N=25), and the executives at the parent organization (N=14) with each other. Robustness is found and the validity of our theoretical framework is confirmed when accusations against nonexecutives do not lead to any significant abnormal stock reactions. Table 5 illustrates this comparison.

--- PLEASE INSERT TABLE 5 ABOUT HERE ---

The findings illustrate that the stronger the association between the accused person and the organization and the higher the hierarchical position of the accused person are, the stronger the negative market reaction becomes. Except for one event window for the overall sample [-1, +1], we report negative but mostly insignificant CAARs for sexual harassment accusations. However, it is remarkable that the CAARs and the statistical significance tend to increase the more the analysis narrows down to executives at parent organizations. Even though the findings are mainly negative, we report weakly significant evidence only for executives at parent organizations for the [-3, +3] event window specification and not in any other case. Thereby the significance in the [-3, +3] event window specification indicates that the market either anticipated some of the events or had a delayed reaction due to the investor learning process (Bebchuk et al., 2013; Bouzzine & Lueg, 2020b; McWilliams & Siegel, 1997).

First, this finding suggests that an executive position and parental employment are necessary for the accusation to damage the organization financially and provides support for our initial findings in Table 4 and our theoretical framework. Thereby, the weak statistical significance is mainly driven by the insignificance of the accusations against Michael Ferro and Nick Caporella (as outlined in the previous section) and the small sample size of executives employed at the parent organization. As one accusation against an executive (Andy Rubin,

Alphabet) is subject to potential bias arising from a confounding event (class action lawsuit announcement against Google in the UK that occurred on the event date (Ruddick, 2017)), we exclude it in a further step and confirm that our findings are not driven by confounding events. This, in turn, supports our theoretical motivation that executives hold particularly important positions and that their misconduct is especially harmful to organizations. Accordingly, we report a significant negative average market reaction only for them.

As a second robustness check, we performed an untabulated sensitivity analysis to confirm the robustness of our estimation procedure. Therefore, similar to Jin et al. (2020), we replace our initial Fama and French (1992) three-factor model with the Fama and French (2015) five-factor model. This sensitivity analysis comprehensively confirms the findings from our initial analysis. Based on these findings, we reject H0, confirm H1, and assume that these findings are robust.

Discussion

Research contributions

This study aimed to answer the research question, *"How and in which situations do investors react to sexual harassment accusations against executives?"*. To this end, we conducted an event study on sexual harassment accusations against executives and concluded that sexual harassment accusations are value destructive but only when they target an executive who holds a leading position at the parent organization. In other cases, it seems that the accusation is viewed by the investors as separate from the organization. This finding is in line with upper echelons theory (Hambrick, 2007; Hambrick & Mason, 1984), which attributes a special role to executives in that their values shape the overall organization due to their crucial role. Based on our findings, we conclude that investors react negatively to sexual harassment acts committed by organizational executives when they are employed at the parent organization.

Our findings represent research contributions in areas that have received little academic attention thus far. First, we illustrate that an individual's misconduct can be financially relevant to the organization even if the individual's behavior does not immediately affect profitability due to the resulting long-term reputation damage. This, in turn, provides strong evidence that *reputation* is an important asset to organizations that is severely threatened by executive misconduct, a fact that is ultimately manifested in stock market penalties. As we detect significant reactions only for accusations against executives at parent organizations, we conjecture that sexual harassment accusations against individual executives become an organizational problem when the executive holds significant managerial power, which supports our initial upper echelons argument (Hambrick & Mason, 1984) which we have enriched by considering abuse of power.

Second, our research provides a novel perspective in upper echelons research (Carpenter et al., 2004; Hambrick, 2007; Hambrick & Mason, 1984; Neely et al., 2020), which, until now, has mainly been concerned with the effect of executive personality traits on managerial decisions (Andersen & Lueg, 2017; Burkert & Lueg, 2013; Hiebl, 2014). Within the original framework proposed by Hambrick and Mason (1984), the *values* of the executive drive the *strategic choice* to engage in sexual harassment, which influences the organization in terms of performance. We further provide evidence that hierarchy, indicated by employment at a parent organization, particularly matters in this regard. With our findings, we demonstrate that unethical values and consecutive executive misconduct might be a research current within the field of upper echelons research that should receive greater attention.

Practical contributions

For practitioners, our finding that executives damage their organizations with sexually abusive behavior comes with important implications. The fact that employees have to utilize public complaints as a means of dealing with workplace sexual harassment, demonstrates that management control systems in organizations largely failed in that regard (Clarke, 2020). To this end, we provide two recommendations that prevent the occurrence of workplace sexual harassment (Lopez et al., 2009).

First, organizations should pay particular attention when hiring executives. They should screen their histories at their prior organizations comprehensively to avoid hiring executives who have exhibited sexually abusive behavior. The hiring by Uber of Amit Singhal, who was known for sexual harassment at his former organization Google (Alphabet) (Isaac & Wakabayashi, 2017), illustrates that the reputation loss following the harassment accusation against Amit Singhal (The Guardian, 2019) should have been given further consideration after the prior screening. In the US, this could have been done by reaching out to reference persons of prior employers stated in the CV to obtain additional, nonpublic information on the executive's behavior. This would help to prevent the hiring of unethical executives.

Second, organizations should monitor how their executives behave, and what types of work environments they establish. First, this implies the implementation of consistent anti-sexual harassment policies, such as grievance procedures and an open-door policy for people to complain about sexual harassment. These measures help to reduce sexual harassment in the workplace, facilitate the maintenance of a professional work environment, and allow victims to address their issues without fear of executive repercussions (Lopez et al., 2009). Second, as proposed by (Lin, 2020), organizations should establish a reform framework that prevents the exploitation of nondisclosure agreements to silence victims and includes the publication of annual misconduct reports. These measures should help to deter executives from committing

sexual harassment. Third, a management control system should be implemented to ensure the functionality of the previously mentioned anti-sexual harassment measures (Ege, 2015; R. Lueg & Radlach, 2016). Fourth, in addition to sanctioning sexual harassment, establishing a climate of permanent organizational nudges, including small policy changes that foster awareness of workplace sexual harassment and training (Perry et al., 2009), should further prevent sexual harassment. By establishing permanent awareness of sexual harassment in employees, potential harassers might be reminded of their ethical duties, thus preventing them from engaging in sexual misconduct (Nelson, 2017; Staley, 2017). In this way, serious harm to the organization driven by employee force-outs, dissatisfaction, public complaints, and consecutive reputation costs can be prevented.

Limitations and future research

Although we provide meaningful, robust results, we assess some aspects of our study design critically.

Methodologically, we acknowledge the issue of the existence of confounding events in our event sample. As outlined by Dyckman et al. (1984) and McWilliams and Siegel (1997), one has to isolate the event of interest from confounding events taking place at the same time to derive unbiased results. While we addressed this efficiently by checking each accusation against the executives for confounding events, event clustering in the media and entertainment industry creates difficulties in this regard. When #MeToo had its pinnacle in 2017 and 2018, with most accusations being made in the media and entertainment industry, substantial M&A activities were underway. These specifically include the bidding war for 21st Century Fox between Walt Disney and Comcast (Weissman, 2018) and the problematic acquisition of Time Warner by AT&T, which was subject to various antitrust issues (Chmielewski, 2018). Both acquisitions created an ongoing emergence of new information at that time, which triggered substantial positive and negative stock reactions that fell into the same time horizon as the

majority of our events concerning media and entertainment organizations. We approached this issue by excluding accusations that took place at the same time as new deal-related information; however, it is possible that these acquisitions, due to their large dimensions, create considerable investor anticipation without specific events taking place, which might confound the results we derived for #MeToo accusations. Even though the small event windows used in this study should exclude many of these merger talk effects, it might be advisable for future researchers to employ sexual harassment events that did not take place simultaneously with major corporate events.

In terms of the interpretation of our findings, we provide evidence that the capital market reacts to the public announcement of sexual harassment accusations. However, our findings also illustrate that there are substantial differences in the impacts of these accusations. While the accusation against Amit Singhal implied abnormal stock losses of -2.00% for Alphabet, the accusation against Paul Marciano triggered abnormal losses of -22.63% for Guess. This difference in market reactions could provide a basis for further research on the antecedents of abnormal stock returns beyond the position of the accused person and type of employment (parent vs. subsidiary). For instance, Carberry et al. (2018), as well as Clemente and Gabbioneta (2017), provide evidence that the media portrayal plays an important role in determining the market reaction to a scandal, which already demonstrates that the popularity of the accused person and the accuser might play an important role in explaining the differences in investors' reactions. Furthermore, the CSR performance of organizations, which was not examined in this study, might be an explanatory factor in regard to protection from the misconduct spillover effect and may partially explain differences in the stock market reactions (Bae et al., 2020; Christensen, 2016). Thus, we view our research, together with the research by Lins et al. (2019) and Billings et al. (2019), as the starting point for capital market research on sexual harassment, which requires consecutive analyses to enhance our understanding of the organizational

implications of sexual harassment. Future research should clarify why there are substantial differences in stock market reactions to executive sexual harassment accusations.

Finally, we acknowledge that we limited our research to the short-term effects of sexual harassment and did not examine how stock prices potentially recovered following the announcement of executive sexual harassment accusations. As outlined within the notion of nudging, the emergence of a sexual harassment scandal might be a trigger for substantial improvements in how sexual harassment is dealt with that are eventually reflected in stock price recovery. This, however, was not addressed in this study.

Appendix

Appendix A: List of sexual harassment accusations

Accused Person	Executive	Announcement Date	Affiliated org.	Employed at	Source
ROGER AILES	Yes	21.07.2016	21st Century Fox	Parent	https://time.com/4413767/roger-ailes-fox-news-resigns-rupert-murdoch/?xid=homepage
NATE PARKER	No	12.08.2016	21st Century Fox	Parent	https://variety.com/2016/film/news/the-birth-of-a-nation-nate-parker-rape-trial-1201836624/
BILL O'REILLY	No	10.01.2017	21st Century Fox	Parent	https://www.nytimes.com/2017/01/10/business/media/bill-oreilly-sexual-harassment-fox-news-juliet-huddy.html
AMIT SINGHAL	Yes	27.02.2017	Alphabet	Parent	https://www.vox.com/2017/2/27/14745360/amit-singhal-google-uber
SEAN HANNITY	No	24.04.2017	21st Century Fox	Parent	https://www.nbcnews.com/news/us-news/sean-hannity-denies-right-wing-blogger-s-sex-harassment-claim-n750211
AUSTIN JONES	No	13.06.2017	YouTube (Alphabet)	Subsidiary	https://chicago.suntimes.com/2017/6/13/18320444/youtube-star-austin-jones-charged-with-child-porn-counts-in-chicago
CHARLES PAYNE	No	06.07.2017	21st Century Fox	Parent	https://www.latimes.com/business/hollywood/la-fi-ct-charles-payne-fox-business-20170706-story.html
ERIC BOLLING	No	05.08.2017	21st Century Fox	Parent	https://www.mediaite.com/online/breaking-eric-bolling-suspended-from-fox-news/
MIKE LOMBARDO	No	17.08.2017	YouTube (Alphabet)	Subsidiary	https://www.newstatesman.com/science-tech/internet/2017/08/i-was-almost-brainwashed-him-how-male-youtubers-get-away-preying-you-0
BEN AFFLECK	Yes	11.10.2017	Time Warner	Parent	https://edition.cnn.com/2017/10/11/entertainment/ben-affleck-apology/index.html
ROY PRICE	Yes	12.10.2017	Amazon Studios (Amazon.com)	Subsidiary	https://www.hollywoodreporter.com/news/amazon-tv-producer-goes-public-harassment-claim-top-exec-roy-price-1048060
AHMET ERTEGUN	Yes	17.10.2017	Atlantic Records (Time Warner)	Subsidiary	https://variety.com/2017/music/news/sexual-harassment-music-industry-dorothy-carvello-1202591488/
MICHAEL HAFFORD	No	17.10.2017	Vice Media (The Walt Disney Company)	Subsidiary	https://www.breitbart.com/tech/2017/10/17/multiple-women-allege-abuse-by-vice-male-feminist-contributor/
CHRIS SAVINO	No	19.10.2017	Nickelodeon (ViacomCBS)	Subsidiary	https://variety.com/2017/tv/news/loud-house-showrunner-chris-savino-fired-nickelodeon-sexual-harassment-charges-1202594788/
STEVE JURVETSON	Yes	24.10.2017	Tesla	Parent	https://www.nytimes.com/interactive/2018/10/23/us/metoo-replacements.html
MARK HALPERIN	No	25.10.2017	NBC (Comcast)	Subsidiary	https://variety.com/2017/biz/news/mark-halperin-sexual-harassment-allegations-1202599610/
KEN BAKER	No	26.10.2017	E! (Comcast)	Subsidiary	https://www.thewrap.com/ken-baker-e-news-sexual-harassment-from-an-unwanted-kiss-to-a-text-about-a-sex-toy/
RICK NAJERA	No	26.10.2017	ViacomCBS	Parent	https://www.nytimes.com/interactive/2018/10/23/us/metoo-replacements.html
ALFRED BLOOMING-DALE	Yes	27.10.2017	Bloomingdale's (Macy's)	Subsidiary	https://www.hollywoodreporter.com/news/harassment-hollywoods-golden-age-survivor-janis-paiges-first-hand-story-1052498https://www.hollywoodreporter.com/news/harassment-hollywoods-golden-age-survivor-janis-paiges-first-hand-story-1052498

Appendix A: List of sexual harassment accusations (continued)

Accused Person	Executive	Announcement Date	Affiliated org.	Employed at	Source
BRETT RATNER	Yes	01.11.2017	Time Warner	Parent	https://variety.com/2017/biz/news/brett-ratner-natasha-henstridge-accused-sexual-harassment-1202604256/
JEREMY PIVEN	No	01.11.2017	ViacomCBS	Parent	https://abcnews.go.com/Entertainment/jeremy-piven-unequivocally-denies-appalling-groping-allegations/story?id=50850242
KEVIN SPACEY	No	03.11.2017	Netflix	Parent	https://money.cnn.com/2017/11/02/media/house-of-cards-kevin-spacey-harassment/index.html
LOUIS C.K.	No	09.11.2017	HBO (Time Warner)	Subsidiary	https://www.theguardian.com/tv-and-radio/2017/nov/09/louis-ck-accused-by-five-women-of-sexual-misconduct-in-new-report
EDDIE BERGANZA	No	10.11.2017	DC Comics (Time Warner)	Subsidiary	https://www.buzzfeednews.com/article/jtes/dc-comics-editor-eddie-berganza-sexual-harassment
ANDREW KREISBERG	No	10.11.2017	Time Warner	Parent	https://variety.com/2017/tv/news/warner-bros-sexual-harassment-andrew-kreisberg-1202612522/
VINCE INGENITO	No	11.11.2017	IGN (J2 Global)	Subsidiary	https://twitter.com/inkydojikko/status/929158341942583296
MARK SCHWAHN	No	13.11.2017	Lions Gate Entertainment Corp. E! (Comcast)	Parent	https://deadline.com/2017/11/one-tree-hill-the-royals-creator-mark-schwahn-accused-sexual-harassment-by-oth-writer-audrey-wauchope-1202207461/
MATT ZIMMERMAN	Yes	14.11.2017	NBC (Comcast)	Subsidiary	https://www.latimes.com/business/hollywood/la-fi-ct-zimmerman-nbc-20171114-story.html
KAJ LARSEN	No	15.11.2017	Vice Media (The Walt Disney Company)	Subsidiary	https://www.thedailybeast.com/unsafe-and-just-plain-dirty-women-accuse-vice-of-toxic-sexual-harassment-culture
ANDY HENRY	No	15.11.2017	ViacomCBS	Parent	https://www.hollywoodreporter.com/news/women-say-veteran-csi-casting-employee-coerced-disrobing-1058398
JASON MOJICA	Yes	15.11.2017	Vice Media (The Walt Disney Company)	Subsidiary	https://www.thedailybeast.com/unsafe-and-just-plain-dirty-women-accuse-vice-of-toxic-sexual-harassment-culture
RYAN SEACREST	No	17.11.2017	E! (Comcast)	Subsidiary	https://www.hollywoodreporter.com/news/ryan-seacrest-denies-reckless-misconduct-allegations-stylist-1059704
CHARLIE ROSE	No	20.11.2017	ViacomCBS	Parent	https://www.washingtonpost.com/investigations/eight-women-say-charlie-rose-sexually-harassed-them--with-nudity-groping-and-lewd-calls/2017/11/20/9b168de8-caec-11e7-8321-481fd63f174d_story.html
GLENN THRUSH	No	20.11.2017	The New York Times Company	Parent	https://www.nytimes.com/2017/11/20/business/media/glenn-thrush-sexual-misconduct.html
JOHN LASSETER	No	21.11.2017	Pixar (The Walt Disney Company)	Subsidiary	https://www.hollywoodreporter.com/news/john-lasseters-pattern-alleged-misconduct-detailed-by-disney-pixar-insiders-1059594
MATT LAUER	No	29.11.2017	NBC (Comcast)	Subsidiary	https://variety.com/2017/biz/news/matt-lauer-accused-sexual-harassment-multiple-women-1202625959/
ANDY RUBIN	Yes	29.11.2017	Alphabet	Parent	https://www.nytimes.com/2018/10/25/technology/google-sexual-harassment-andy-rubin.html
MIKE TIRICO	No	06.12.2017	NBC (Comcast)	Subsidiary	https://www.hollywoodreporter.com/news/nbcs-next-headache-new-olympics-host-mike-tirico-has-harassment-his-past-1064718

Appendix A: List of sexual harassment accusations (continued)

Accused Person	Executive	Announcement Date	Affiliated org.	Employed at	Source
STEPHEN HENDERSON	No	06.12.2017	The Detroit Free Press (Gannett Co.)	Subsidiary	https://www.fox2detroit.com/news/wxyz-anchor-malcom-maddox-placed-on-leave-amid-claims-of-sexual-harassment
JOE ALEXANDER	Yes	06.12.2017	The Martin Agency (The Interpublic Group of Companies)	Subsidiary	https://adage.com/article/agency-news/exit-martin-agency-cco-joe-alexander-internal-investigation/311550
HAROLD FORD JR.	No	07.12.2017	Morgan Stanley	Parent	https://www.huffpost.com/entry/harold-ford-fired-morgan-stanley_n_5a29743ee4b0b185e53a0ce6?psa=&guccounter=1
JON HEELY	No	08.12.2017	The Walt Disney Company	Parent	https://variety.com/2017/biz/news/jon-heely-disney-music-group-child-sex-abuse-1202634502/
LARRY KING	No	11.12.2017	CNN (Time Warner)	Subsidiary	https://www.newsweek.com/terry-richard-larry-king-harassment-744826
ERIC DAVIS	No	12.12.2017	ESPN (The Walt Disney Company)	Subsidiary	https://www.bloomberg.com/news/articles/2017-12-12/nfl-harassment-suit-alleges-groping-by-top-executive-ex-players
HEATH EVANS	No	12.12.2017	ESPN (The Walt Disney Company)	Subsidiary	https://www.bloomberg.com/news/articles/2017-12-12/nfl-harassment-suit-alleges-groping-by-top-executive-ex-players
IKE TAYLOR	No	12.12.2017	ESPN (The Walt Disney Company)	Subsidiary	https://www.bloomberg.com/news/articles/2017-12-12/nfl-harassment-suit-alleges-groping-by-top-executive-ex-players
MARSHALL FAULK	No	12.12.2017	ESPN (The Walt Disney Company)	Subsidiary	https://www.bloomberg.com/news/articles/2017-12-12/nfl-harassment-suit-alleges-groping-by-top-executive-ex-players
MORGAN SPURLOCK	No	13.12.2017	TNT (Time Warner)	Subsidiary	https://www.hollywoodreporter.com/news/morgan-spurlock-posts-lengthy-sexual-harassment-mea-culpa-i-am-part-problem-1067561
BRAD KERN	No	14.12.2017	ViacomCBS	Parent	https://www.hollywoodreporter.com/live-feed/ncis-new-orleans-showrunner-was-twice-investigated-misconduct-1067865
CARTER OOSTERHOUSE	No	14.12.2017	HGTV (Discovery)	Subsidiary	https://www.hollywoodreporter.com/news/carter-oosterhouse-accused-coerced-oral-sex-by-makeup-artist-1067502
JOHN BUCCIGROSS	No	14.12.2017	ESPN (The Walt Disney Company)	Subsidiary	https://deadspin.com/boston-globe-report-on-espn-reveals-pregnancy-discrimin-1821309239
CHRIS MATTHEWS	No	16.12.2017	NBC (Comcast)	Subsidiary	https://www.foxnews.com/entertainment/nbc-paid-off-producer-who-accused-chris-matthews-of-harassment-report-says
ANDREW CREIGHTON	Yes	23.12.2017	Vice Media (The Walt Disney Company)	Subsidiary	https://www.nytimes.com/2017/12/23/business/media/vice-sexual-harassment.html
MIKE GERMANO	Yes	23.12.2017	Vice Media (The Walt Disney Company)	Subsidiary	https://www.nytimes.com/2017/12/23/business/media/vice-sexual-harassment.html?_r=0
RHYS JAMES	No	23.12.2017	Vice Media (The Walt Disney Company)	Subsidiary	https://www.nytimes.com/2017/12/23/business/media/vice-sexual-harassment.html?_r=0

Appendix A: List of sexual harassment accusations (continued)

Accused Person	Executive	Announcement Date	Affiliated org.	Employed at	Source
DAN HARMON	No	03.01.2018	NBC (Comcast)	Subsidiary	https://www.avclub.com/former-community-writer-megan-ganz-calls-out-dan-harmon-1821754073
STEVE BUTTS	No	03.01.2018	IGN (J2 Global)	Subsidiary	https://kotaku.com/ign-fires-editor-in-chief-for-alleged-misconduct-1821747243?utm_campaign=Socialflow_Kotaku_Twitter&utm_source=Kotaku_Twitter&utm_medium=Socialflow
STAN LEE	Yes	09.01.2018	Marvel Comics (The Walt Disney Company)	Subsidiary	https://www.independent.co.uk/arts-entertainment/art/news/stan-lee-sexual-harassment-claims-allegations-marvel-latest-a8150571.html
JAMES ROSEN	No	10.01.2018	21st Century Fox	Parent	https://www.npr.org/2018/01/10/577093288/top-fox-news-d-c-reporter-james-rosen-left-network-after-harassment-claims
JONATHAN KAIMAN	No	11.01.2018	Los Angeles Times (Tribune Publishing)	Subsidiary	https://www.hongkongfp.com/2018/01/11/los-angeles-times-beijing-bureau-chief-apologises-sexual-misconduct-allegation/
CHARLIE WALK	No	13.01.2018	Epic Records (Sony Corporation)	Subsidiary	https://www.billboard.com/articles/news/8097519/republic-records-charlie-walk-leave-sexual-misconduct-claims
ROSS LEVINSOHN	Yes	18.01.2018	Los Angeles Times (Tribune Publishing)	Subsidiary	https://www.npr.org/2018/01/18/578612534/accusations-of-frat-house-behavior-trail-la-times-publisher-s-career
OMEED MALIK	No	19.01.2018	Bank of America Corporation	Parent	https://www.nytimes.com/2018/01/19/business/bank-of-america-sexual-misconduct-omeed-malik.html
NIGEL COE	No	19.01.2018	Morgan Stanley	Parent	https://www.wsj.com/articles/howwall-street-keeps-metoo-claims-out-of-the-spotlight-1516407408
ROB MOORE	No	22.01.2018	New York Daily News (Tribune Publishing)	Subsidiary	https://www.npr.org/sections/thetwo-way/2018/01/22/579840869/new-york-daily-news-exec-investigated-after-harassment-complaint
ALEXANDER JONES	No	25.01.2018	New York Daily News (Tribune Publishing)	Subsidiary	https://www.nytimes.com/interactive/2018/10/23/us/metoo-replacements.html
JESS RAVICH	No	25.01.2018	TCW Group (The Carlyle Group)	Subsidiary	https://www.wsj.com/articles/ex-tcw-executive-says-firm-fired-her-for-alleging-sexual-harassment-1516927532
STEVE WYNN	Yes	26.01.2018	Wynn Resorts	Parent	https://www.nbcnews.com/storyline/sexual-misconduct/vegas-casino-king-steve-wynn-accused-pattern-sexual-misconduct-wall-n841441
PATRICK WITTY	No	29.01.2018	National Geographic (The Walt Disney Company)	Subsidiary	https://www.vox.com/2018/1/29/16934552/exclusive-national-geographic-sexual-misconduct
JOHN KENNEALLY	Yes	31.01.2018	Monster Beverage Corporation	Parent	https://www.huffpost.com/entry/monster-energy-john-kenneally-resigns_n_5a722351e4b05253b275370a
PAUL MARCIANO	Yes	01.02.2018	Guess	Parent	https://www.thecut.com/2018/02/kate-upton-accuses-guess-founder-of-harassing-women.html
TIMUR EMEK	No	15.02.2018	Victoria's Secret (L Brands)	Subsidiary	https://www.buro247.my/fashion/buro-loves/celebrity-photographers-accused-sexual-misconduct.html

Appendix A: List of sexual harassment accusations (continued)

Accused Person	Executive	Announcement Date	Affiliated org.	Employed at	Source
DAVID BELLEMERE	No	16.02.2018	Victoria's Secret (L Brands)	Subsidiary	https://www.bostonglobe.com/metro/2018/02/16/beauty-and-ugly-truth/c7r0WVsF5cib1pLWXJe9dP/story.html
GREG KADEL	No	16.02.2018	Victoria's Secret (L Brands)	Subsidiary	https://www.bostonglobe.com/metro/2018/02/16/beauty-and-ugly-truth/c7r0WVsF5cib1pLWXJe9dP/story.html
MICHAEL LADGE	No	16.03.2018	Morgan Stanley	Parent	https://mynewsla.com/business/2018/03/16/former-assistant-at-morgan-stanley-sues-financial-adviser-to-katy-perry-alleging-sex-harassment/
MICHAEL FERRO	Yes	19.03.2018	TRONC (Tribune Publishing)	Parent	https://fortune.com/2018/03/19/tronc-chairman-michael-ferro-allegations/
TOM BROKAW	No	26.04.2018	NBC (Comcast)	Subsidiary	https://variety.com/2018/tv/news/tom-brokaw-sexual-harassment-nbc-news-correspondent-1202789627/
NEV SCHULMAN	No	18.05.2018	MTV (ViacomCBS)	Subsidiary	https://www.bbc.com/news/newsbeat-44165569
BLAIR FLEMING	No	08.06.2018	Royal Bank of Canada	Parent	https://www.bloomberg.com/news/articles/2018-06-08/rbc-fired-u-s-investment-banking-chief-over-affair-with-staffer
CHRIS HARDWICK	No	14.06.2018	AMC Networks Inc.	Parent	https://medium.com/@skydart/rose-colored-glasses-6be0594970ca
A.J. CALLOWAY	No	28.06.2018	Telepictures Productions (Time Warner) NBCUniversal (Comcast)	Subsidiary	https://www.hollywoodreporter.com/features/russell-simmons-an-extra-host-nbc-news-a-sexual-assault-accusers-story-1123824
NICK CAPORELLA	Yes	03.07.2018	National Beverage	Parent	https://www.wsj.com/articles/billionaire-behind-lacroix-accused-of-improper-touching-by-two-pilots-1530648681
DEMOS PARNEROS	Yes	03.07.2018	Barnes & Noble Education	Parent	https://teleread.org/2018/07/03/bn-abruptly-fires-ceo-demos-parneros-for-no-clear-reason/
LES MOONVES	Yes	27.07.2018	ViacomCBS	Parent	https://www.newyorker.com/magazine/2018/08/06/les-moonves-and-cbs-face-allegations-of-sexual-misconduct
KIMBERLY GUILFOYLE	No	27.07.2018	21st Century Fox	Parent	https://www.huffpost.com/entry/kimberly-guilfoyle-misconduct-allegations-fox-news_n_5b5a6064e4b0b15aba96f4de
PARIS DENNARD	No	22.08.2018	CNN (AT&T)	Subsidiary	https://www.hollywoodreporter.com/news/cnn-suspends-contributor-paris-dennard-sexual-misconduct-report-1136903
RICHARD LIU	Yes	04.09.2018	JD.com	Parent	https://www.wsj.com/articles/jd-com-founder-gets-back-to-business-in-beijing-days-after-arrest-in-u-s-1536062833
JEFF FAGER	No	12.09.2018	ViacomCBS	Parent	https://www.cnbc.com/2018/09/12/60-minutes-executive-producer-jeff-fager-leaves-cbs-after-violating-company-policy.html
RICHARD DEVAUL	Yes	25.10.2018	Google X (Alphabet)	Subsidiary	https://www.nytimes.com/2018/10/25/technology/google-sexual-harassment-andy-rubin.html
MICHAEL WEATHERLY	No	13.12.2018	ViacomCBS	Parent	https://www.nytimes.com/2018/12/13/business/media/cbs-bull-weatherly-dushku-sexual-harassment.html
FRANKIE SHAW	No	17.12.2018	ViacomCBS	Parent	https://www.hollywoodreporter.com/news/smilf-creator-frankie-shaw-investigated-misconduct-claims-1170077
VIC MIGNOGNA	No	19.04.2019	Funimation Productions (Sony Corporation)	Subsidiary	https://variety.com/2019/gaming/news/vic-mignogna-sues-funimation-1203193225/

Appendix A: List of sexual harassment accusations (continued)

Accused Person	Executive	Announcement Date	Affiliated org.	Employed at	Source
TYRUS/BRODUS CLAY	No	11.06.2019	Fox Corporation	Parent	https://www.thedailybeast.com/fox-nation-star-tyrus-accused-of-sexual-harassment-by-co-host-britt-mchenry
DON LEMON	No	14.08.2019	CNN (AT&T)	Subsidiary	https://news.yahoo.com/cnn-anchor-don-lemon-is-sued-by-a-bartender-over-alleged-assault-145454699.html
JOHN CRIST	No	07.11.2019	Netflix	Parent	https://www.hollywoodreporter.com/live-feed/netflix-pulls-john-crist-special-sexual-misconduct-allegations-1253257
FAUSTO BRIZZI	No	29.11.2019	WarnerMedia (AT&T)	Subsidiary	https://variety.com/2017/film/global/warner-bros-removes-italian-director-from-promotional-materials-following-sexual-misconduct-allegations-1202624422/
DONOVAN MCNABB	No	10.12.2019	ESPN (The Walt Disney Company)	Subsidiary	https://eu.usatoday.com/story/sports/nfl/2017/12/12/donovan-mcnabb-eric-davis-suspended-espn-investigates-sexual-harassment-allegations-nfl-network/943898001/
MALCOM MADDOX	No	17.12.2019	WXYZ-TV (The Walt Disney Company)	Subsidiary	https://eu.freep.com/story/news/local/michigan/detroit/2017/12/06/sexual-harassment-anchor-malcom-maddox-wxyz/926643001/

Appendix A illustrates our research sample (98 sexual harassment accusations) and displays the accused person, whether the person represents an executive or not, the announcement date, the affiliated organization, whether the affiliated organization represents a parent or a subsidiary, and the source of the accusation.

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Tables

Table 1: Research sample construction

Organizational affiliation	**Number of accusations**	**%**
Yes	238	64.0%
No	134	36.0%
US-listed	**Number of accusations**	**%**
Yes	120	50.4%
No	118	49.6%
At the event date	**Number of accusations**	**%**
Yes	114	95.0%
No	6	5.0%
After Roger Ailes	**Number of accusations**	**%**
Yes	98	86.0%
No	16	14.0%
Final sample	**98**	

Table 1 displays the construction of the final research sample. From the original sample of 372 accusations, 238 are affiliated with organizations of which 120 are US-listed. 114 of these were listed when the accusation took place. Of these 114 accusations, 98 took place after the accusation against Roger Ailes.

Table 2: Distribution of the research sample

Industry category	**Number of accusations**	**%**
Business	13	13.3%
Entertainment	36	36.7%
Fashion	3	3.1%
Media	42	42.9%
Technology	4	4.1%
Sex of the accused person	**Number of accusations**	**%**
Female	2	2.0%
Male	96	98.0%

Table 2 reports the distribution of the accusations and groups them by organizational category (The Creep Sheet) and the sex of the accused person.

Table 3: Characteristics of accused persons

Employed at	**Number of accusations**	**%**
Parent	42	42.9%
Subsidiary	56	57.1%
Executive	**Number of accusations**	**%**
Yes	25	25.5%
No	73	74.5%
Executive at the parental organization	**Number of accusations**	**%**
Yes	14	14.3%
No	84	85.7%

Table 3 illustrates the characteristics of the accused person regarding their type of employment. From the research sample of 98 accusations, 42 are employed at the listed parental organization whereas 56 are employed at a subsidiary. 25 accused persons represent executives and 73 normal employees. Of the 25 executives, 14 are employed at the parental organization.

Table 4: CARs for accusations against executives

Accused person	Announcement date	Affiliated organization	Executive at parental organization	[-1, +1]		[-3, +3]		[-5, +5]	
				CAR	P-Value	CAR	P-Value	CAR	P-Value
Roger Ailes	21.07.2016	21st Century Fox	Yes	-3.46%**	0.0165	-4.88%**	0.0270	-6.05%**	0.0287
Amit Singhal	27.02.2017	Alphabet	Yes	-2.00%*	0.0882	-2.70%	0.1316	-3.80%*	0.0903
Ben Affleck	11.10.2017	Time Warner	Yes	-1.89%**	0.0145	-2.63%**	0.0260	-2.28%	0.1241
Roy Price	12.10.2017	Amazon.com	No	1.04%	0.4586	1.50%	0.4838	1.34%	0.6184
Ahmet Ertegun	17.10.2017	Time Warner	No	0.32%	0.6878	-2.02%*	0.0931	-3.62%	0.0164
Steve Jurvetson	24.10.2017	Tesla	Yes	-3.58%	0.3471	-11.78%**	0.0428	-6.30%	0.3874
Alfred Bloomingdale[a]	27.10.2017	Macy's	No	-10.15%**	0.0297	-9.13%	0.2004	-5.79%	0.5175
Brett Ratner	01.11.2017	Time Warner	Yes	-4.11%***	0.0000	-5.33%***	0.0000	-13.37%***	0.0000
Matt Zimmerman	14.11.2017	Comcast	No	1.96%	0.3320	2.08%	0.4994	4.33%	0.2627
Jason Mojica	15.11.2017	Walt Disney	No	-0.76%	0.6515	0.88%	0.7328	2.54%	0.4305
Andy Rubin[a]	29.11.2017	Alphabet	Yes	-4.13%***	0.0009	-3.10%	0.1026	-0.51%	0.8296
Joe Alexander	06.12.2017	Interpublic Group of Companies	No	-1.55%	0.6563	4.21%	0.4287	6.56%	0.3246
Andrew Creighton	23.12.2017	Walt Disney	No	-1.35%	0.4326	-3.43%	0.1902	0.83%	0.7493
Mike Germano	23.12.2017	Walt Disney	No	-1.35%	0.4326	-3.43%	0.1902	0.83%	0.7493
Stan Lee	09.01.2018	Walt Disney	No	-2.53%	0.1751	-1.80%	0.5273	1.95%	0.5841
Ross Levinsohn[a]	18.01.2018	Tribune Publishing	No	6.07%*	0.0588	11.62%**	0.0179	10.68%*	0.0826
Steve Wynn	26.01.2018	Wynn Resorts	Yes	-21.39%***	0.0000	-17.34%***	0.0000	-5.35%	0.2314
John Kenneally	31.01.2018	Monster Beverage	Yes	-0.43%	0.7629	-4.76%**	0.0289	-5.89%**	0.0310
Paul Marciano	01.02.2018	Guess	Yes	-22.63%***	0.0000	-14.60%**	0.0485	-15.48%*	0.0954
Michael Ferro	19.03.2018	Tribune Publishing	Yes	1.59%	0.7146	4.07%	0.5396	9.13%	0.2716
Nick Caporella	03.07.2018	National Beverage	Yes	1.14%	0.7088	4.84%	0.3005	-5.18%	0.3765
Demos Parneros	03.07.2018	Barnes & Noble Education	Yes	-5.73%	0.1017	-13.16%**	0.0138	-16.69%**	0.0127
Les Moonves	27.07.2018	ViacomCBS	Yes	-9.40%***	0.0012	-7.95%*	0.0726	-8.99%	0.1050
Richard Liu	04.09.2018	JD.com	Yes	-14.02%***	0.0000	-15.63%***	0.0000	-15.05%***	0.0018
Richard DeVaul	25.10.2018	Alphabet	No	2.27%	0.1410	0.64%	0.7862	0.45%	0.8794

Table 4 reports the event study findings for 25 accusations against organizational executives. We display the respective executive in column 1, the announcement date of the accusation in column 2, the affiliated organization in column 3, and the declaration of whether the the executive is employed at the parental organization or not in column 4. We include three event window specifications and report CARs and the P-values of the t-statistic of Boehmer et al. (1991) adjusted by Kolari and Pynnönen (2010) throughout columns 5 to 10. ***, ** as well as * denote statistical significance at the 1, 5, and 10% level, respectively. We further tested all CARs with the nonparametric generalized rank test of Kolari and Pynnönen (2011) which led to the same conclusions as to the parametric test. Accusations against executives denoted with [a] are subject to a potential bias arising from confounding events taking place at the same time.

Table 5: Robustness check

Aggregation	[-1, +1]		[-3, +3]		[-5, +5]	
	CAR	**P-Value**	**CAR**	**P-Value**	**CAR**	**P-Value**
CAAR (Total sample)	0.78%	0.4414	-3.27%	0.4428	-7.37%	0.4508
CAAR (Parent organization)	-0.79%	0.4152	-0.97%	0.4143	-1.25%	0.3908
CAAR (Executive)	-3.95%	0.2658	-3.77%	0.2206	-3.19%	0.2938
CAAR (Executive at the parent organization)	-6.43%	0.1969	-6.78%*	0.0953	-6.84%	0.1847
CAAR (Executive at the parent organization without confounding events)	-6.61%	0.2120	-7.07%*	0.0947	-7.33%	0.1351

Table 5 displays the findings for cross-sectional aggregations. We display the type of aggregation in column 1. We include three event window specifications and report CARs and the P-values of the t-statistic of Boehmer et al. (1991) adjusted by Kolari and Pynnönen (2010) throughout columns 2 to 7. * denotes statistical significance at the 10% level. We further tested all CAARs with the nonparametric generalized rank test of Kolari and Pynnönen (2011) which led to the same conclusions as to the parametric test.

Figures

Figure 3: Theoretical framework

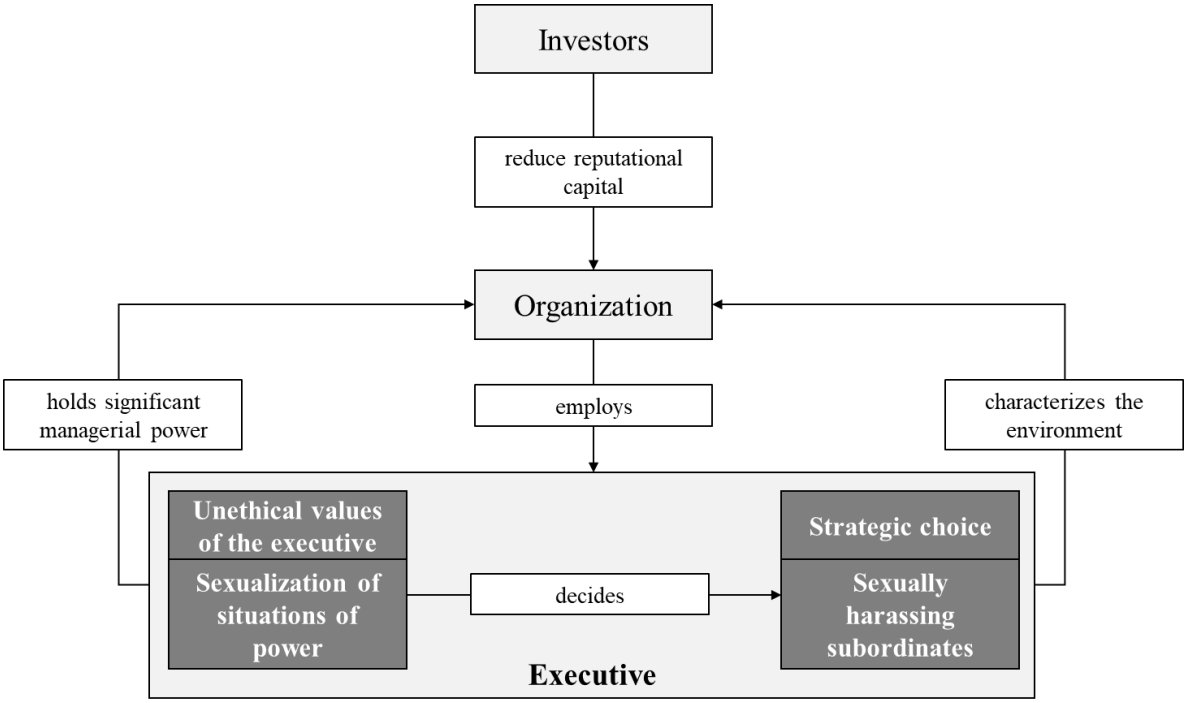

Figure 1 displays the interrelation between upper echelons theory and sexual harassment. Therefore, we complement the original framework by Hambrick and Mason (1984) and adjust it to account for sexual harassment. The central element of this framework are the executives, who hold unethical values on sexuality, making them sexualize situations of power. These executives are employed at the organization and hold significant managerial power. Due to their unethical values, executives decide to harass subordinates sexually (strategic choice), which characterizes the environment of the organization. When the sexual misconduct becomes public (e.g., by a public #MeToo accusation), the investors react by selling the stocks of the affected organization and reducing the reputation capital.

Figure 4: Cumulative accusations

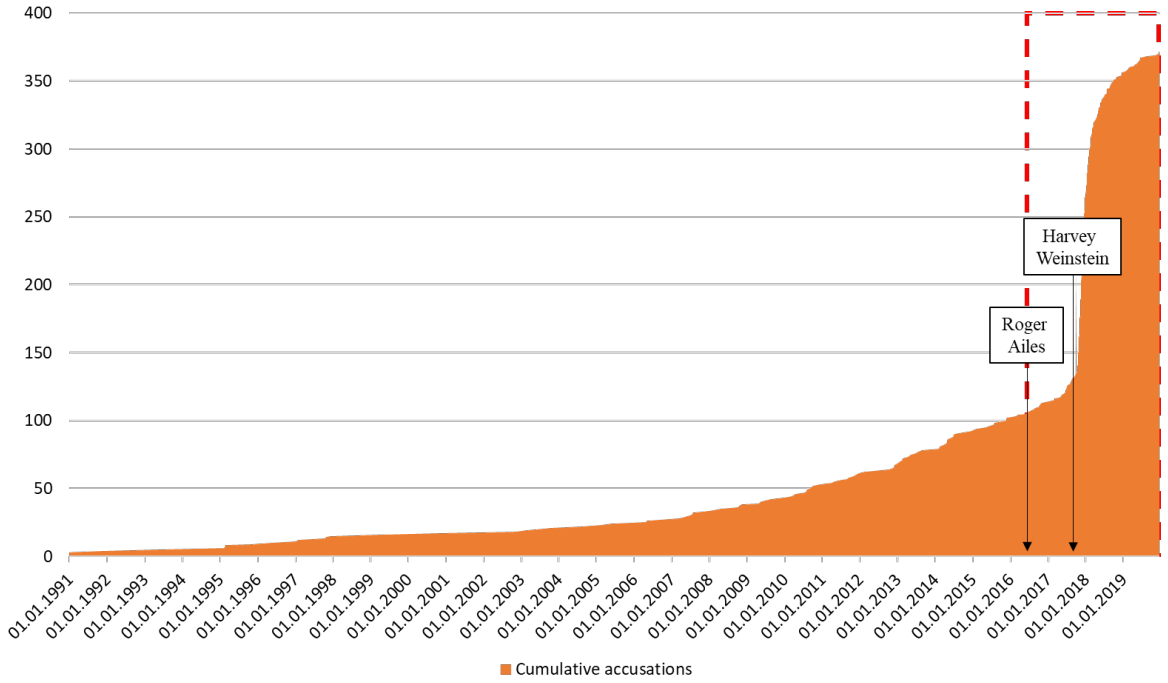

Figure 2 displays the development of the sexual harassment accusations in our sample. We display the number of accusations on the y-axis and the time on the x-axis. The red dashed square highlights the accusations we consider in this study, starting from Roger Ailes. We further highlight the revelation of the accusations against Harvey Weinstein as it represents a turning point in the development of #MeToo. The steep growth of the curve after Weinstein illustrates how this accusation unfolded numerous accusations.

5 The shareholder value effect of system overloads: An analysis of investor responses to the 2003 blackout in the US

Abstract

This study investigates the stock price reaction of electric energy utility firms to the 2003 blackout in the Northeast of the USA and if the market was able to identify the responsible firm. Therefore, we employ event study methodology and select a sample of US-based electric energy utility firms. Although it took a commission almost eight months to name the firm responsible for the blackout, investors punished FirstEnergy only two trading days after the blackout - and were right, as it later turned out. This study demonstrates this based on the analysis of abnormal stock returns and abnormal trading volumes. Our findings suggest that investors have extensive knowledge of electric energy utility firms' responsibility as they were able to identify the culprit. This, in turn, demonstrates that electric power utility firms should ensure a high-quality grid infrastructure to avoid these negative outcomes.

Keywords: Event study; Blackout; System overload; Market efficiency

Introduction

On 14 August 2003 shortly after 4 pm, a large part of the northeast of the USA experienced a major blackout. In total, the blackout left 50 million people without electricity for up to two days and contributed to at least 11 deaths, making it one of the most severe blackouts in US history. The blackout was a consequence of a series of human and system failures, including overgrown trees next to the high-voltage power line and bugged alarm systems at FirstEnergy Corporation (FirstEnergy), which did not inform the control room of the line damage (Minkel, 2008). The blackout itself, however, represented only the tip of the iceberg as the power system in the Northeast of the US has long been subject to inadequate transmission capacity and bottlenecks due to a limited number of high-voltage lines. This, in turn, fostered the emergence of the blackout as local generators tried to supply energy to areas in need which caused the lines to overload and to collapse, ultimately. Since the privatization and liberalization of the US electric energy system, there was limited interest in private utility firms to invest in new wires, new towers, and new transformers, which eventually fostered the occurrence of the system overload and the corresponding blackout (Antonsen et al., 2010; Firestone & Pérez-Peña, 2003; Xin, 2005). Yet, not everyone shared this opinion of relevance. Traders of Wall Street did not seem to expect lasting damage and trading to be normal and secured by backup generators (McGeehan & Schwartz, 2003). We want to test this claim and pose the following research question:

RQ1: Did the blackout trigger abnormal returns for electric power utility firms on the stock market?

Second, we want to analyze whether the stock market was able to identify the responsible firm for the blackout (system overload) which we cover in our second research question:

RQ2: Was the stock market able to identify the responsible firm (culprit)?

To this end, we employ event study methodology and analyze the abnormal stock returns and trading volumes associated with the blackout incident (MacKinlay, 1997).

Several scholars have examined the economic consequences of electricity blackouts. They found that electricity blackouts are generally associated with adverse effects on labor productivity of affected firms due to work interruptions (Falentina & Resosudarmo, 2019; Fisher-Vanden et al., 2012), making them particularly costly in economic terms with regard to welfare losses (Anderson et al., 2007; Nkosi & Dikgang, 2018; Yamashita et al., 2008).

To analyze the effects of blackouts on specific firms, scholars also employ event study methodology to examine respective stock price reactions (Yamashita et al., 2008). Previous empirical analyses on the stock price reaction to the 2003 blackout and blackouts in general by electric power utility firms already provided first evidence in that regard: Blumsack and Ositelu (2015) conducted a comprehensive analysis of 274 blackouts between 2000 and 2010 and further distinguished their sample of blackouts regarding their causes. For their overall sample, they report average abnormal stock losses for electric power utility firms shortly after the blackout, which is followed by an above-average stock recovery phase. For blackouts in consequence of a natural disaster, this stock recovery phase takes longer as damages caused by natural disasters are usually devastating and require large investments. Finally, they provide evidence that blackouts affecting more than one million customers imply stronger average abnormal stock losses than 'smaller' blackouts. Joo et al. (2007) specifically investigated the impact of the 2003 blackout on the stock returns of 36 electrical power suppliers and 22 electrical equipment suppliers in the US. They grouped their sample and came to the general conclusion that electric power utility firms suffered significant stock losses upon the blackout

event while electric equipment firms benefited from it. Our research directly builds on this finding; however, it takes a different angle on this incident. We specifically want to identify not only how the stocks of electric power utility firms reacted to the blackout event but also if the market was able to identify the culprit before the official commission report.

Based on the literature review, we hypothesize that the stock price of the responsible firm (culprit), FirstEnergy, reacts negatively to the electricity blackout incident while other electric power utility firms remain neglected by the stock market. Therefore, we formulate the following hypotheses:

H0: There are no abnormal stock reactions to the blackout by the responsible firm (culprit).

H1: There are abnormal stock reactions to the blackout by the responsible firm (culprit).

Materials and Methods

In the course of the investigation, we first calculate the normal returns to be able to define abnormal returns and then test for normal distribution. In a further step, we analyze the trading volumes to detect potential abnormal changes in volumes due to the blackout.

We select the event study methodology to answer our research questions. This event study aims to test the information efficiency of the stock market. It should determine if and when there was a reaction to new information being the announcement of the blackout. This strongly relates to the assumption of market efficiency. For our investigation, however, we assume a semi-efficient market whereas the blackout represents a meaningful event: according to estimates, it caused damage in the billions (Minkel, 2008) and similar evidence for other events has been provided by prior literature (Maloney & Mulherin, 2003). Therefore, event studies provide the clearest evidence on the efficiency of stock markets (Fama, 1991).

The existence of multiple events raises the question, which of these events should be used as the underlying event for the analysis. Building on information efficiency, we suggest the first emergence of the blackout represents a suitable event for this purpose, i.e., August 14th, 2003.

This brings the advantage that the blackout still represents an exogenous shock and, thus, allows us to avoid problems of endogeneity (Eckbo et al., 1990; Prabhala, 1997). Therewith, we address the issue of premature information leakage efficiently, which would not be possible in the case of ex-ante insider knowledge.

In the literature, it is common practice to define an event window more generously, usually at least the day of the event and the following day (MacKinlay, 1997). However, as the blackout was unexpected for that day, we examine the event day [0] and include two subsequent days [+1] [+2] to account for potential time lags in the reaction.

At this point, one could argue that by extending the time window, further price reactions in the following days can be included, or that the abnormal return is not measured at all because it is even further away in time. While this is correct, it would otherwise also lead to increasing parameter instability (MacKinlay, 1997). Furthermore, the sensitivity of our analysis decreases with the length of the event window; i.e., the application of different calculation methods does not usually cause significant differences in the results (Fama, 1991).

Another positive circumstance is the exact time of occurrence. By clearly defining the event window, the model becomes more robust and reduces the sensitivity of the results (Brown & Warner, 1985). By that, we reduce the probability of further events overlapping, and, thus, improve the measurement accuracy with the three-day event window.

As an additional analysis to identify the responsible firm, we employ a peer group and expect a non-reaction of the share prices of uninvolved peers and a significant abnormal (negative) return of the responsible firm under the condition of well-informed markets.

We do not examine the days before the blackout as we assume a semi-efficient market (Dow & Gorton, 1993; French & Roll, 1986). As already outlined, the premature leakage of information can be ruled out since insiders could have considered a blackout due to grid overload as probable. However, this would still have been fraught with many uncertainties that clear instructions for action would not be given. We, therefore, assume that this event study

builds on publicly available information that can be determined in terms of time and was triggered by an exogenous shock.

We select the firms for the comparative analysis according to several criteria. First, we examine FirstEnergy, as the commission report identified it as the culprit. Then, this blackout could be relevant for all electric power utility firms across the board. To analyze that, we select a comparison group from the LexisNexis database. We include the following firms in the analysis to test whether the market only sanctioned the responsible firm:

- American Electric Power Company
- Consolidated Edison Inc.
- Dominion Resources Inc.
- Duke Energy Corporation
- PPL Corporation
- Public Service Enterprise Group Inc.

To become a comparative firm, the following conditions must be met by them: (1) the firm's shares are traded on the New York Stock Exchange during the entire investigation period; (2) a clear commitment in the energy sector, especially in the supply of electricity; and (3) a clear commitment in the region of the blackout, meaning the Northeast of the US.

We apply the general event study framework by MacKinlay (1997). The first step in analyzing the effect of the blackout is to calculate the normal returns. In the second step, we compare them with the actual returns to calculate the abnormal returns. If their distribution deviates from the null hypothesis, we can conclude a significant effect in step three. This procedure is considered to be a clear indicator of significant events (Fama, 1991), especially in the short term, and will be applied to the 2003 blackout in the following.

The first decision in calculating the normal rate of return is that of the adequate model. Since our event window is only three days long, methodological subtleties have only a marginal influence on the overall result. Furthermore, the results do not differ significantly within the

group of statistical methods (MacKinlay, 1997). We deliberately refrained from using an economic model such as the CAPM or the APT since their restrictive assumptions can lead to high sensitivity of the results (Fama & French, 1996) or have little further empirical value (Brown & Weinstein, 1985). We, therefore, ultimately decide in favor of the market model (MacKinlay, 1997):

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

where $E(R_{it})$ represents the expected stock return for i on day t, R_{mt} the market return on day t, β_i the beta factor (risk), and ε_{it} the disturbance term. We set the period for calculating the normal return (estimation window) at one year, ending ten days before the blackout. This is necessary so that the effects of the event do not influence the period, for which it is intended to serve as a benchmark (MacKinlay, 1997), although similar publications sometimes only include an estimation window of 3 months (Maloney & Mulherin, 2003). By using a longer period, we have achieved a better explanation of the residual deviation for all firms. With an even larger extension of the observation period, the remaining deviation decreases again, so that the stock market year, which is also usual in literature, provided the highest explanatory values in our model (Table 1).

The source for the returns is the "*RI*" ("Total Return Index") of Thomson Reuters Datastream which includes standardized returns with adjustments for changes in equity and elimination of accounting effects. Furthermore, they exclude tax effects and brokerage fees. RI_t thus indicates a theoretical increase in the value of a share, whereby investors always use dividends to purchase new shares at the ex-post distribution price.

We collected daily stock data. This allows a more accurate measurement of abnormal returns and thus strengthens the validity of this study. However, due to the lack of smoothing, these data are much more volatile than monthly or weekly data.

We normalized these returns and calculated the mean to obtain the normal market. This is the return that can be expected for the days following the event, assuming the null hypothesis. If

the deviations of the following days cannot be explained, the null hypothesis must be rejected, and the event had a significant impact on the actual returns.

We selected the S&P500 as the market index as it represents a standard market portfolio. A portfolio consisting only of firms in the energy sector would not fulfill this purpose since a large part of the firms contained in it are part of this study and thus the independence of the sample from the population would no longer be guaranteed (Brown & Warner, 1980).

Results

The abnormal returns due to the blackout

Table 1 displays the findings of the market model and depicts the expected returns for all firms in our sample.

--- PLEASE INSERT TABLE 1 ABOUT HERE ---

The period for measuring the abnormal return begins on the day of the blackout, 14 August 2003 [0], and ends after two further trading days [+1] and +2]. They are calculated as the difference between the actual and the expected returns:

$$AR_{it} = R_{it} - E(R_{it}) \tag{2}$$

where AR_{it} refers to the abnormal returns for i on day t. We performed this calculation for all firms and compared the results with the expected value of the return. The differences are the abnormal returns. We tested the abnormal returns for statistical significance using a t-test, which tests the probability that the differences between the realized returns and the expected returns are random. To overcome the over-rejection of the null hypothesis due to event-induced variance and cross-sectional correlation, we employ the t-statistic by Boehmer et al. (1991) adjusted by Kolari and Pynnönen (2010). Table 2 displays the abnormal returns for our event windows:

--- PLEASE INSERT TABLE 2 ABOUT HERE ---

At first sight, one can see that the reactions are not strong except for FirstEnergy. On top of that, the ARs for FirstEnergy are the only ones that are highly significant. With regard to our hypothesis, we can conclude that the market was indeed able to identify FirstEnergy as the firm responsible for the blackout and that only two trading days after the blackout took place. This was reflected in a heavy sellout by the investors of FirstEnergy.

As a means of a robustness check, we have employed the publication date of the commission report (2 March 2004) as the underlying date for a further event study and to test whether the publication of the report triggered any abnormal stock reactions at FirstEnergy (Federal Energy Regulatory Commission, 2004). In line with our hypothesis, we do not detect any abnormal stock reactions neither for FirstEnergy nor for any other electric power utility firm in our sample (untabulated). This robustness check comprehensively confirms our initial finding and demonstrates that the market has already discounted the stock of FirstEnergy two trading days after the blackout and, therefore, did not react with the final publication of the commission report.

The abnormal trading volumes due to the blackout

A significant correlation between the blackout and the values traded can also be demonstrated using trading volumes. Analogous to the calculation of the normal returns, we choose a period of one year to determine the mean of the traded volumes. These were again compared with the realized volumes of the following two trading days. We report the findings in Table 3. The null hypothesis is that the event did not influence the trading volume. At least for FirstEnergy, Consolidated Edison, Duke Energy, and the PPL, we cannot reject the null hypothesis.

--- PLEASE INSERT TABLE 3 ABOUT HERE ---

It should be noted, however, that the trading volumes, except for FirstEnergy and Consolidated Edison, show negative deviations from historical values, i.e., the innocent firms were traded less than expected. As seen in Table 3, the deviations remain in the range of approx. 50% to

just over 100%. This is less than one standard deviation for the innocent firms. Besides, our estimate of the degrees of regression was relatively good, since the standard deviations are on a fairly low level.

With FirstEnergy, on the other hand, the situation is quite different: trading was on average five times as high as expected and the standard deviation was seven times as high, so we can assume that the trading volumes of FirstEnergy stocks are much less of a coincidence than the other significant three. On closer inspection, it is also remarkable that almost all of this abnormal trading took place on the second trading day after the blackout. Analogous to the explanation of the abnormal return, we can conclude that the price determination took three trading days in total.

We, therefore, state that the trading of FirstEnergy's stock was more heavily to its disadvantage. As expected, most of the innocent firms did not experience any extraordinary trading volume. Why, however, the other firms despite Consolidated Edison - American Electric Power Company, Dominion Resources Inc., Duke Energy Corporation, PPL Corporation, and Public Service Enterprise Group Inc. - were traded less than usual remains an open question. There remains an increased presumption of innocence: the traders were sure that these three had nothing to do with the blackout and deliberately wanted to smooth the trading.

Discussion

This study intends to answer the question of whether the blackout on August 14, 2003, had a significant, negative impact on the stock returns and trading volumes of the firm responsible for the blackout. The primary objective of this study is to investigate whether markets react efficiently to the blackout as new information and can identify the culprit.

The tendency is to affirm this. The stock market identified FirstEnergy and punished it as the culprit within three trading days. Our models for this purpose are reliable. It took the investigative commission almost eight months to reach the same verdict so that one can speak

of a relatively fast and efficient reaction of the stock market. On the other hand, we can affirm an ‘acquittal’ for innocent firms, which have largely been neglected by investors despite the severity of the blackout. This, in turn, provides robust evidence that investors specifically targeted FirstEnergy as the firm responsible for the blackout.

The observed trading volumes support our results: FirstEnergy’s stocks were subject to heavy trading which was several times as often as “normally”, while most other firms remain below their normal trading volume. This again speaks for the theory of the punishment for FirstEnergy and the explicit disregard of innocent firms.

Finally, the nature and processing of the information also argue in favor of our results since the US-American media did not start addressing issues at FirstEnergy until Sunday, speaking for a rational, macroeconomic price formation and a semi-efficient market (CNN, 2003).

By providing this evidence for efficient and informed markets, we clearly illustrate that neglecting necessary investments in the infrastructure and security systems for cost-saving can ultimately lead to the opposite and yield heavy stock losses. Then, the market’s ability to identifying the culprit only two trading days after the blackout reveals that investors are well-informed about the state of the energy infrastructure and whose responsibility this is. Thus, we recommend that electric power utility firms ensure a high-quality infrastructure to avoid these negative outcomes.

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Tables

Table 1: Market model estimation

Firm	alpha	beta	Market returns	Expected returns	R^2	F-Test (p-value)	Std. errors
First Energy	0.006	0.661	0.05%	0.63%	49.00%	0.00	0.062
American Electric Power Company	-0.168	0.846	0.05%	-16.80%	52.20%	0.00	0.075
Consolidated Edison Inc.	-0.027	0.287	0.05%	-2.70%	38.70%	0.00	0.033
Dominion Resources Inc.	-0.002	0.888	0.05%	-0.20%	69.00%	0.00	0.055
Duke Energy Corporation	0.038	0.155	0.05%	3.80%	45.50%	0.00	0.016
PPL Corporation	0.055	1.186	0.05%	5.60%	76.70%	0.00	0.060
Public Service Enterprise Group Inc.	0.045	1.555	0.05%	4.60%	63.30%	0.00	0.109

Table 1 displays the alpha and beta coefficients, market returns, expected returns, the R^2, the p-values of the F-test, and the standard errors of the estimates for the market model estimation based on daily returns, respectively.

Table 2: Abnormal returns

Firm	[0]	t-test (p-value)	[+1]	t-test (p-value)	[+2]	t-test (p-value)
First Energy	-0.88%	0.6117	-1.34%	0.4377	-9.93%***	0.000
American Electric Power Company	0.46%	0.8774	-0.46%	0.8759	-1.25%	0.6738
Consolidated Edison Inc.	-0.72%	0.5816	-0.47%	0.7187	0.04%	0.9780
Dominion Resources Inc.	-0.60%	0.6547	0.14%	0.9160	-0.72%	0.5902
Duke Energy Corporation	-0.59%	0.2986	0.49%	0.3843	-0.65%	0.2470
PPL Corporation	0.07%	0.9648	0.08%	0.9573	-0.81%	0.5900
Public Service Enterprise Group Inc.	-0.30%	0.8673	0.70%	0.6985	-0.69%	0.7038

Table 2 reports the event study findings for the blackout event. We include three event window specifications and report respective abnormal returns. Statistical significance is determined based on the t-statistic of Boehmer et al. (1991) adjusted by Kolari and Pynnönen (2010). The p-values of the t-tests are provided behind each abnormal return. ***, ** as well as * denote statistical significance at the 1, 5, and 10% levels, respectively.

Table 3: Abnormal trading volumes

Firm	14.08.2003	15.08.2003	18.08.2003	Mean (12 months)	% of expected trading	t-test (p-value)	Std. deviation
First Energy	1,123.00	1,438.00	16,812.00	1,208.00	534.40%	0.417	7.420
American Electric Power Company	917.00	567.00	673.00	2,380.00	30.20%***	0.004	0.078
Consolidated Edison Inc.	699.00	1,031.00	1,174.00	892.00	108.50%	0.643	0.277
Dominion Resources Inc.	12.00	9.00	6.00	63.00	14.10%***	0.001	0.046
Duke Energy Corporation	10.00	6.00	15.00	14.00	76.00%	0.324	0.320
PPL Corporation	1,437.00	454.00	705.00	1,587.00	54.50%	0.136	0.323
Public Service Enterprise Group Inc.	646.00	836.00	807.00	1,148.00	66.40%**	0.023	0.091

Table 3 includes the respective trading volumes on each day of the event window and the mean volume of the last 12 months before the blackout Furthermore, it displays the ratio of actual volumes in comparison to expected volumes in percent, the standard deviations, and indicates the statistical significance of the abnormal trading volumes based on the p-values of a two-tailed t-test. ***, ** as well as * denote statistical significance at the 1, 5, and 10% levels, respectively.

6 Moral Licensing Theory, Corporate Sustainability, and Organizational Misconduct: A Conceptual Framework

Abstract

Purpose: The purpose of this study is to illustrate how past CSR affects the occurrence of organizational misconduct through the means of moral licensing and to derive recommendations to firms regarding their CSR strategy.

Design/methodology/approach: To this end, we first develop a conceptual framework illustrating the underlying mechanism of moral licensing and second provide initial literature-based evidence for this mechanism.

Findings: We suggest a conceptual framework that supports the counterintuitive relationship between past CSR and organizational misconduct. Based on initial literature-based findings, we illustrate that past CSR indeed fosters the occurrence of organizational misconduct which requires a special interest in the design of the underlying CSR strategy.

Originality: This study is the first to interrelate CSR, moral licensing, and organizational misconduct from a conceptual perspective.

Practical implications: We plead that firms should establish management control systems that specifically address the issue of moral licensing when evaluating CSR initiatives. Then, we propose that firms should adhere to a consistent CSR strategy that potentially functions as effective prevention of moral licensing and consecutive misconduct.

Keywords: Moral licensing, Organizational misconduct, Institutional theory, Corporate sustainability, Management control

Introduction

In recent times, organizational misconduct has received greater academic interest. This interest is reflected in both, examining the antecedents and the consequences of organizational misconduct while the latter is yet much more thoroughly discussed (Greve et al., 2010; Paruchuri & Misangyi, 2015; Pozner, 2008). When looking at the antecedents, one can distinguish organizational and individual causes that eventually lead to organizational misconduct. Thereby, organizational characteristics such as compliance practices and ethical climate are seen as major drivers of misconduct and characteristics of individuals as less relevant (Andreoli & Lefkowitz, 2009). More recently, research increasingly questions this view and posits that executive personality traits and cognitive biases matter in that regard (van Scotter & Roglio, 2020).

Within the area of cognitive biases affecting organizational misconduct, the notion of *moral licensing* emerged as a salient concept. Thereafter, individuals formerly behaving ethically eventually use this past moral behavior as a license to act unethically in the future (Blanken et al., 2015). Even though this bias is individual, it might translate into organizational behavior if leading organizational officials are subject to this bias (Blanken et al., 2015; Lin et al., 2016). There is plentiful anecdotal evidence illustrating how firms first behaved morally superior and later engaged in severe misconduct. One prominent example refers to the Volkswagen (VW) diesel emissions scandal (Dieselgate) in which VW implemented a software-based cheating device in diesel cars that undermined emissions testing and led to substantial human and financial damage (Bouzzine & Lueg, 2020; Dey et al., 2018; Fracarolli Nunes & Lee Park, 2016; Lin et al., 2020; Zhang et al., 2021). This misconduct was preceded by a sustainability reporting outlining VW's substantial effort to green the car fleet which was well-perceived by the stakeholders (Allam et al., 2020). Similar behavior has been observed in the case of Enron. Former Enron CEO Kenneth Lay invested heavily in personal and firm social

initiatives (donations, university chair funding) within the CSR strategy, became a leading figure in US philanthropy, and accumulated significant moral credit (Ormiston & Wong, 2013). Eventually, this moral credit was later exchanged to engage in irresponsible behavior that led to one of the US's biggest corporate fraud scandals (Oppel Jr. & Sorkin, 2001). Despite being regularly associated with greater sustainability (Klotz & Bolino, 2013), these cases illustrate that past corporate social responsibility (CSR) is not a warranty for future CSR. Rather, firms might be even incentivized to engage in misconduct in the consequence. To account for this relation of past and future CSR performance, this study aims to answer the following research questions:

RQ1: How does past CSR affect the emergence of organizational misconduct?

RQ2: How can firms prevent that past CSR is employed as a moral license to engage in misconduct?

Therefore, we consolidate the knowledge on the relationship between CSR as a means of moral licensing and organizational misconduct and develop the underlying conceptual mechanism based on the extant literature on this matter. Furthermore, we aim to provide recommendations for CSR strategies that help to prevent organizational misconduct as a consequence of prior moral licensing.

Our study reveals, in line with moral licensing, that past CSR is indeed associated with consecutive misconduct. Based on the development of a conceptual framework, we provide recommendations to firms regarding corporate governance and CSR strategies to overcome this issue.

A moral licensing perspective on organizational misconduct

Moral licensing is a cognitive bias. Its theoretical concept was originally discussed in psychology research and increasingly finds its way into management research (Blanken et al., 2015; Greene & Low, 2014; Klotz & Bolino, 2013). The concept argues that the past behavior of an individual influences its subsequent behavior. If this past behavior is deemed as good and socially desirable, the individual eventually considers the past behavior as permission to act less responsibly in the future (Kouchaki, 2011). There are two underlying, eventually complementary, mechanisms behind this bias: moral credit and moral credentials. We will outline in the following how the—up to now—purely individual-based, psychology theory of moral licensing has an institutionalizing effect and thereby becomes applicable to a meso-level, organizational theory. For this, we relate to structuration theory as it explains how individual agency becomes an organizational structure (Giddens, 2013). Structuration theory purports that the actions of individuals ("*systems"*) institutionalize by being embedded in permanent habits or other organizational members ("*structures"*). In the following, we will explain the properties of our suggested framework on moral licensing (see Figure 1).

--- PLEASE INSERT FIGURE 1 ABOUT HERE ---

As to the first main mechanism, individual leaders obtain *moral credit* for past good conduct, either by themselves or by their organization (Effron & Conway, 2015). For the misbehaving individual, obtaining a moral license prior to the misconduct might reduce damages to the personal reputation and favor forgiveness, therefore, limiting the potentially detrimental effects of misconduct and enhancing its attractiveness (Klotz & Bolino, 2013; Wang & Chan, 2019). Once the precondition of moral credit exists, some leaders are prone to the bias that this moral credit can be exchanged or weighted against bad conduct in the future. We illustrated this anecdotally by the Dieselgate case, where past environmentally-conscious conduct seemed to justify prospective dishonesty. After this point, the mechanism goes beyond

the individual bias and institutionalizes at the level of the organization in two ways. First, employees observe the misconduct of their leaders. Often, it is even necessary that employees are compliant with the misconduct. The leader has power over their employees, which enables them to enforce their complicity. This abuse relates to the treatment of employees and pressuring them into pro-firm behavior that is eventually unethical (Kong et al., 2020; Lin et al., 2016). Thereby, the high status of organizational leaders helps them to obtain a social moral license to engage in misconduct (Lasarov & Hoffmann, 2020; Polman et al., 2013). Thereby, the individual misconduct is institutionalized. Second, a counterbalancing, moderating effect stems from management control systems (MCS). MCS might reduce the transformation of moral credit at this stage through nudging (such as making decision biases explicit), input controls (such as thoroughly vetting the achievements of appointed leaders), or process controls (such as precise prescriptions on how budgets may be spent). As leaders overrule the governance enforced by MCS, they institutionalize their misconduct.

The second main mechanism is *moral credentials* that are granted from stakeholders to the organization. It is not a direct condition such as moral credit, but a moderating mechanism. Once the leader decides in favor of misconduct (sub-mechanism a), the by-standing internal (and possibly external) stakeholders observe the misconduct or are even complicit. Stakeholders might not consider the misconduct grave enough to intervene. The reason for this appeasement is that the stakeholder assigns high moral credentials to the organization due to past corporate sustainability, and exposes the bias that a good organization cannot do something bad. They show understanding, try to cause little damage to the organization in legal or economic terms, or do not believe what has been disclosed about the misconduct. This allows the leader to reinforce and thereby institutionalize the misconduct (sub-mechanism b). Again, MCS have a counterbalancing effect. Overruling them visibly leads, again, to stronger institutionalization of the misconduct.

At some point, the output at the level of actually performed actions creates outcomes that are in overly stark contrast to the corporate sustainability policies and reports. The misconduct lowers organizational reputation. This can manifest as a realized, public scandal, but also as an only anticipated, internal issue that does (probably) not align with the organizational goals. The organization reacts by counteracting the misconduct and reinforcing their Corporate Sustainability policies and reports (sub-mechanism c). This rebuilds organizational reputation, and thereby fuels the moral credit of leaders within the organization. The leaders adapt and learn how to get away with misconduct. They adapt their strategies and start a new cycle (sub-mechanism d).

Empirical findings on CSR, moral licensing, and organizational misconduct

In this section, we provide the initial findings on literature explicitly examining the relationship between past CSR, moral licensing, and organizational misconduct. So far, only a few studies have empirically tested this interrelation.

Ormiston and Wong (2013) study the relationship between CSR and organizational irresponsibility. Drawing on moral licensing as the underlying theoretical framework, they examine the behavior of 49 leaders of 'Fortune 500' firms from 1996–2002. Therefore, they consider the CSR performance of respective firms and measure the influence of executive morality. In line with moral licensing, they report that past CSR is an antecedent of future corporate irresponsibility. They argue that executives, who consider themselves morally licensed to engage in irresponsibility, can influence the CSR practices of a firm and, therefore, substantially worsen CSR performance in the consequence. List and Momeni (2021) provide further evidence on the relationship between CSR and misconduct, thereby, focusing on the role of employees. Based on a natural field experiment with 1,500 employees, they investigate how CSR influences prospective employee misconduct and report that employees familiar with the social component of their work are more likely to cheat. Interestingly, this effect is

emphasized when the social component of a role refers to social engagement for the employees and not for the firm itself. Therewith, they provide compelling evidence for moral licensing on the employee level.

Accordingly, the empirical evidence on the relationship between past CSR, moral licensing, and misconduct generally confirms the underlying conceptual framework of moral licensing.

Conclusion

This study is the first to outline the underlying mechanism behind the relationship of past CSR and organizational misconduct by the means of moral licensing. Therefore, we reviewed the empirical evidence on this matter. With regard to RQ1, the conceptualization of the underlying mechanism revealed that past CSR might function as a moral license to act less responsibly in the future. Individuals who behaved responsibly in the past might attribute themselves a moral credit that can be exchanged for acting irresponsibly in the future, hence, representing a cognitive bias. Given that the biased individual assumes a leading position in the organization, past CSR might trigger them to act irresponsibly not only personally but also organizationally, eventually leading to severe organizational misconduct with negative consequences. This conceptual construct has been compellingly confirmed in first empirical studies examining how past CSR performance affects the future moral behavior of executives and employees (List & Momeni, 2021; Ormiston & Wong, 2013). As illustrated in the Introduction, there are plentiful practical cases that demonstrate this exact behavior. Hence, our proposed conceptual framework might help to better understand the antecedents of organizational misconduct

This entanglement of past CSR and future misconduct comes with various implications for CSR strategy. To address our RQ2, we posit theory-grounded recommendations for practitioners that help to overcome this issue that potentially undermines CSR strategies. Thereby, it is important to note that CSR is generally associated with significant advantages for

firms as it contributes to obtaining a competitive advantage, good reputation, and customer satisfaction, ultimately leading to enhanced organizational performance (Saeidi et al., 2015).

First, to seize these advantages, firms should establish MCS that hold leaders accountable for misconduct (Lueg & Radlach, 2016). Boards should be careful when executives engage in CSR and pay particular attention to the aftermath of CSR initiatives. Executives might consider these initiatives as a moral license to engage in irresponsibility in the future. Thereby, executives who want to establish a moral image of themselves are even more likely to become irresponsible afterward which deserves particular attention. To prevent this behavior of moral licensing and misconduct, boards should establish zero-tolerance policies regarding irresponsible behavior and communicate them clearly to the executives (Ormiston & Wong, 2013). These policies, however, should not include rewarding schemes for engaging in CSR as these tend to increase the likelihood of moral licensing and, thus, misconduct (Zhong et al., 2010).

Second, next to establishing MCS that prevent misconduct in the first place, firms need to promote consistency in their CSR strategies. According to Mullen and Monin (2016), firms that are consistent in their CSR strategies are more likely to trigger value-consistent behavior. Thereafter, individuals behave more consistently with the values of the firm if they can infer the personal behavior on firm behavior, which enhances commitment to these values. On the other hand, moral licensing is promoted by focusing on progress instead of commitment, providing ambiguity in firm moral behavior, and pursuing goals that conflict with each other. This idea of consistency is also stressed by Rodermans (2019). While Rodermans (2019) generally confirms that there is a moral licensing effect stemming from past CSR, he posits that there is a concurrent effect taking place at the same time – the selection effect. Thereafter, morally superior employees select those firms as potential employers that exhibit high CSR. This implies that firms with consistent and intense CSR strategies can attract morally superior

employees that do not engage in misconduct. On the other hand, sudden adoptions of CSR, ambiguity in CSR strategies, and variation in CSR intensities foster moral licensing and, thus, occurrences of misconduct.

Concluding, this paper investigates how past CSR affects organizational misconduct, concludes that moral licensing, as the underlying mechanism, potentially causes individuals to engage in misconduct in consequence with potentially harmful consequences to businesses and society, and provides concise recommendations to firms that help to overcome this issue.

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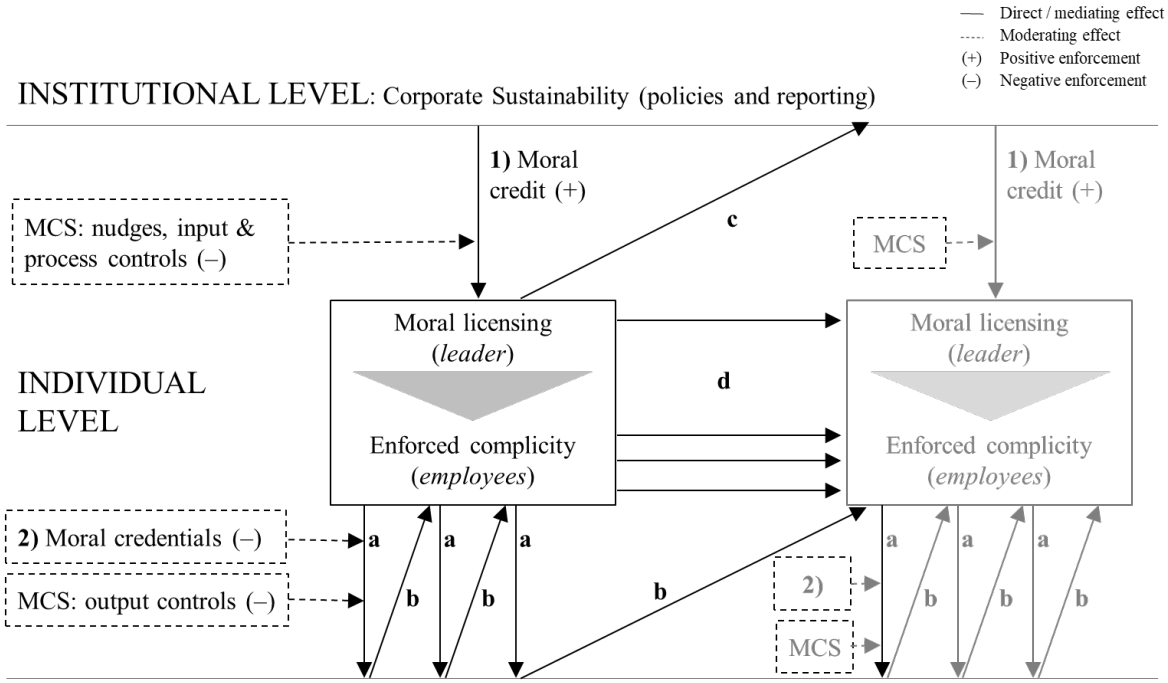
Figures

Figure 1: Interrelation of moral licensing, CSR, and misconduct



a) misconduct by individuals, b) reinforcement of misconduct, c) reinforcement of CS, d) learning how to get away with misconduct.

Figure 1 displays the interrelation of moral licensing, CSR, and misconduct and illustrates the institutionalization process inside the organization.

7 What can Nudges offer to stop Workplace Sexual Harassment? A Conceptual Framework

Abstract

This paper examines workplace sexual harassment. Specifically, it looks into why workplace sexual harassment remains a pervasive, underappreciated problem in the United States. This paper outlines the limitations of existing controls of sexual harassment at work, namely sexual harassment policies, awareness training, and grievance procedures. Based on these limitations, it reflects on the current definitions of sexual harassment and introduces the concept of *nudging* to support the preventive and corrective measures already adopted to combat workplace sexual harassment. It provides a conceptual framework of nudges that might be effective in reducing incidents of sexual harassment. The eight types of nudges that form the framework are grouped in five overall categories depending on who a nudge is for: top, middle, and line management, harassers and potential harassers, observers, victims, and society.

Keywords: Sexual harassment; nudging; management control; ethics; human resource management.

Introduction

It took a long time before the issue of sexual harassment received the attention it deserved. Starting in the 1980s in the United States, numerous researchers from various disciplines (e.g., organizational behavior, occupational and social psychology, human resource management, law) have begun, at an increasing pace, to seriously consider and explore this issue from a scientific point of view (Adams-Roy & Barling, 1998; Clarke, 2020; Diehl *et al*., 2014). The incidence and prevalence of sexual harassment, as well as its causes and consequences, have been analyzed in a significant number of studies (Ilies *et al*., 2003; Willness *et al*., 2007).

Simultaneously, the United States Equal Employment Opportunity Commission (EEOC), which administers and enforces federal laws regarding discrimination or harassment, hastened to churn out a legal definition of workplace sexual harassment. The EEOC guidelines defined sexual harassment as "unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature…" (EEOC, 1997). The EEOC also stated that workplace sexual harassment was a form of sex discrimination prohibited by Title VII of the Civil Rights Act of 1964.

However, a turning point was marked only in 1986 when the United States Supreme Court recognized sexual harassment as a violation of Title VII. Since then, organizations have rapidly equipped themselves with sexual harassment policies, training programs, and internal reporting mechanisms intending to prevent sexual harassment at work, thus avoiding the emerging legal risk associated with this United States Supreme Court's decision. So far, the measures seem to be consistent – with the sole exception that the efforts undertaken by now have not delivered the desired results. The first tweet of Alyssa Milano, which helped launch the #MeToo movement in 2017, and the following avalanche of sexual harassment allegations have shown how inadequate existing sexual harassment legislation and organizational compliance management in the United States are (Clarke, 2020). While it is true that today more victims are feeling empowered to come forward and stand up to their harassers, and harassers, in turn,

are becoming more cautious, the general gender hostility, however, has not yet seen improvements (Keplinger *et al*., 2019).

More or less, 95% of organizations in the United States have a sexual harassment policy and grievance procedures (Society for Human Resource Management, 2018; Dobbin & Kalev, 2019), and 71% of them provide sexual harassment sensitivity training (Cole, 2017). Nevertheless, little has changed in the sexual harassment rates (Gillett, 2017; Graf, 2018). Sexual harassment continues to be a pervasive threat in the workplace, which translates into high psychological, physical, and monetary costs for both individuals and organizations (Fitzgerald *et al*., 1997; Welsh, 1999; Lim & Cortina, 2005; McDonald, 2012). In light of these unsatisfying results, we raise the following research question:

RQ: How can organizations prevent workplace sexual harassment beyond existing law and preventive/corrective practices from management control systems?

We argue that sexual harassment persists, despite initiatives to diminish it, in part because most organizations developed these initiatives around the desire to escape legal liability. The blame for this behavior could be placed on the jurisdictional interpretation of Title VII of the Civil Rights Act of 1964 as well as on the failure of courts to distinguish between meaningful and symbolic compliance, as a result of which the policies and procedures adopted by employers turned out to be mere symbols of compliance (Grossman, 2003; Edelman & Cabrera, 2020). On the other hand, pressure to comply did not give organizations the necessary time to adopt effective management control systems to direct employee behavior. Guided by this compliance-based approach, organizations focused less on preventing sexual harassment at work while simultaneously relaxing the monitoring of the adherence to organizational sexual harassment rules and the punishment for compliance violation (Bergman *et al*., 2002; Rhode, 2019). We label existing policies and procedures, as well as awareness training as traditional administrative controls (Malmi & Brown, 2008). Traditional management control systems

emphasize the actions that victims and employers can take ex-post to respond to incidents of sexual harassment. We argue that they are not designed to avoid those incidents.

A further reason why sexual harassment continues to happen regularly may be attributed to the legal lens through which workplace sexual harassment is usually viewed. The legal focus has a strong influence on how the organization and its employees think about and respond to it. Sexual harassment policies do not frame sexual harassment as ethically problematic, and training programs do not approach this issue from an ethical perspective (Tenbrunsel *et al*., 2019). Organizations emphasized complying while neglecting the ethical and social implications of workplace sexual harassment. This narrow perspective of how to deal with workplace sexual harassment might have given organizations the illusion that they are doing what is right (Tenbrunsel *et al*., 2019).

We continue to argue that organizations engaged in a form of decoupling comparable to the so-called means-ends decoupling (Bromley & Powell, 2012). Organizations have adopted policies and procedures but turned a blind eye to their actual effectiveness (Lawton, 2004; Edelman, 2016). Bromley and Powell (2012) have described this specific form of decoupling as symbolic implementation. Decoupling happened partly because organizations were afraid of losing legal protection and partly because courts limited themselves to require only the existence of policies and complaint procedures on paper without checking whether they are in practice effective in reducing workplace sexual harassment (Lawton, 2004; Edelman *et al*., 2011).

This paper conceptualizes workplace sexual harassment as an unethical practice per se (Bowes-Sperry & Powell, 1999; O'Leary-Kelly & Bowes-Sperry, 2001). Many individuals and also organizations are affected by the harmful consequences of workplace sexual harassment (O'Leary-Kelly *et al*., 2009; Shaw *et al*., 2018). From a business ethics perspective, organizations have certain moral duties to their employees by virtue of their positions (Freeman,

1997; Lahdesmaki, 2005). We, therefore, claim that it is their moral responsibility to effectively reduce the amount of workplace sexual harassment and redress the harm it may create.

An easier way to deal with sexual harassment at work is to blame somebody for these incidents happening (Jansen & Von Glinow, 1985). Instead, organizations should take responsibility and initiate appropriate adjustments to prevent sexual harassment. At this juncture, organizations might think about recoupling policies and practices, means and ends, so that the real outcomes, as suggested by de Bree and Stoopendaal (2020), do not deviate from the original goals. This is crucial because research suggests that negative organizational responses can do more harm than the sexually harassing behavior itself (Fitzgerald *et al*., 1997). Leaders in organizations should play a pivotal role in supporting the fight against workplace sexual harassment. Research indeed demonstrates that leadership efforts to stop sexual harassment and the persistence of a climate of intolerance of sexual harassment increase the chances that employees will react positively to the anti-sexual harassment practices and that these practices will have an influence on their behaviors (Offermann & Malamut, 2002; Aryee *et al*., 2012).

We suggest that organizations should direct their attention to the use of nudging as a potential tool to compensate for the limitations of current solutions – sexual harassment policies, training, and grievance procedures – that address workplace sexual harassment. As a public policy tool, nudging has demonstrated the potential for promoting public welfare (Benartzi *et al*., 2017). At the same pace as public policy nudging, nudging has been lately spreading among private companies to improve employee health engagement, productivity, financial well-being, and ethicality (Hossain & List, 2012; Choi *et al*., 2017; Haugh, 2017).

The purpose of this paper is to evaluate the potential of nudging in reducing workplace sexual harassment. This paper contributes to the literature in several ways. First, it analyzes sexual harassment from a legal perspective. It tries to identify why organizations' compliance-oriented behavior is largely ineffective, particularly the existing management controls of sexual harassment. Relatedly, it employs duty-based ethics to motivate the accountability of

organizations and explain why they should move beyond what is legal. Second, it describes nudging's basic principles and attempts to compare nudging concisely to the established organizational controls of sexually harassing behavior. Finally, it proposes types of nudges that effectively support organizations to manage sexual harassment. Therewith, we present a framework of possible nudging mechanisms organized by the involved actors: victims, harassers and potential harassers, observers, society, top, middle, and line management.

Workplace Sexual Harassment

Definitions of sexual harassment

The body of work on sexual harassment provides diverse approaches defining sexually harassing behavior, but despite decades of research, a generally accepted definition of this phenomenon is still missing. Most literature distinguishes between legal, social-psychological, and organizational definitions.

In 1980, the officially established guidelines for sexual harassment by EEOC defined sexual harassment as: "unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when this conduct explicitly or implicitly affects an individual's employment, unreasonably interferes with an individual's work performance, or creates an intimidating, hostile, or offensive work environment" (EEOC, 1997). Using this definition, the law in the United States identified two relatively distinct types of actionable sexual harassment: *quid pro quo* (when sexual activity is made a condition for favorable treatment in the workplace) and *hostile work environment* (when sex-based conduct creates an abusive or hostile environment that impacts one's ability to work). Recently, the EEOC updated its definition, and it now states that "it is unlawful to harass a person (an applicant or employee) because of that person's sex". Besides, "harassment does not have to be sexual, however, and can include offensive remarks about a person's sex. For example, it is illegal to harass a woman by making offensive comments about women in general". Moreover,

to be considered illegal hostile environment sexual harassment, it must be pervasive or severe enough to be judged as having harmed the work environment. Hence, "the law doesn't prohibit simple teasing, offhand comments, or isolated incidents that are not very serious" (EEOC, n.d.). On the one hand, this legal definition served as an orientation for American courts. On the other hand, the courts tended to focus myopically on this narrow definition, thus overlooking myriad aspects that drive the sexually harassing behavior.

To account for the experience of targets of sexual harassment, psychologists identified three behavioral dimensions of sexual harassment: gender harassment, unwanted sexual attention, and sexual coercion (Fitzgerald *et al*., 1995a). *Gender harassment* refers to verbal and nonverbal, sexist, and derogatory behaviors aimed at denigrating people because of their gender, gender identity, or sexual orientation. *Unwanted sexual attention* entails unwelcome sexual remarks, sexual gestures, suggestive calls and materials, sexual advances, or other actions that seek to gain sexual attention. Finally, *sexual coercion* consists of sexual solicitations coupled with job-related benefits or threats (Roehling & Huang, 2018). Sexual coercion generally corresponds with quid pro quo sexual harassment, while unwanted sexual attention and gender harassment with hostile environment sexual harassment. Despite the late amendments made to the EEOC definition, the law has primarily concentrated on the sexualized and coercive forms of sexual harassment, not on the gender harassment type (National Academies of Sciences, Engineering and Medicine, 2018). Since this latter category includes less intense and severe experiences, much of the gender harassment that victims experience does not rise to the legally actionable level, although this category is the most occurring form of sexual harassment (Kabat-Farr & Cortina, 2014). Social science and organizational definitions are, in this sense, often broader than the legal definition of sexual harassment. First, they do not require negative job outcomes for claiming sexual harassment (Clarke, 2014). Second, they argue that, for the most part, sexual harassment unfolds in a form that has little to do with sexuality. Individuals' motivations to engage in sexual harassment are disparate, thus developing a unitary

view of the causes of sexual harassment is still a research challenge. In any case, sociological literature generally conceptualizes sexual harassment as an expression of power, structural discrimination, exclusion, or gender-based hostility rather than of sexual desire (Welsh, 1999; Browne, 2006; Berdahl, 2007a; Popovich & Warren, 2010; Holland & Cortina, 2016).

Sociologists assert a close relationship between power and sexual harassment (Popovich & Warren, 2010). Sexual harassment is a product of power and status differences in organizations and society – particularly, gender unevenness in power – and a mechanism by which individuals gain, maintain or exercise power both at work and in society (Welsh, 1999). Individuals may use sex to obtain power or use power to obtain sexual favors. By sexually harassing a victim, perpetrators may also have as a purpose the need to decrease the power of the victim (Remick *et al*., 1990). Both individuals and groups with low social or organizational power and those who represent a threat for traditional hierarchies of power (like women, ethnic and sexual minorities) are an easy target of sexual harassment (Berdahl, 2007b; McLaughlin *et al*., 2012; Edelman & Cabrera, 2020). Besides being a counterproductive behavior that involves abuse of some type of power, be it achieved, gender, or ethnic (Remick *et al*., 1990), sexual harassment often occurs in many different ways that deviate from the traditional two ones (quid pro quo and hostile environment). As an example, some researchers define sexual harassment as a form of workplace aggression (Neuman & Baron, 2005), bullying (Rayner & Keashly, 2005), and even emotional abuse (Keashley & Harvey, 2005). When looking at the characteristics of victims and harassers and the behaviors that define sexual harassment, it appears that sexual harassment also develops in the form of symbolic violence, microaggressions, or structural discrimination (Berdahl & Moore, 2006; Quick & McFadyen, 2017). However, these aspects are underrepresented in the current conceptualization of sexual harassment. Moreover, a link between workplace sexual harassment and other unlawful employment practices has not yet been established in the legal scholarship nor by the EEOC.

Existing management controls of workplace sexual harassment

In the United States, the courts decided that employers have to bear the burden of liability for the physical, psychological, and economic harm that sexual harassment causes to their employees. Consequently, employers are legally mandated to take appropriate actions to prevent and deal with workplace sexual harassment (Grossman, 2003). The required interventions usually include the adoption of sexual harassment policies, training programs, and internal grievance procedures. Based on the management control systems framework by Malmi and Brown (2008), these interventions can be allocated to the group of administrative controls. According to the authors, administrative controls direct employee behavior through the organizing of individuals and groups and the relationships that connect them within organizations, the monitoring of behavior and the setting of accountability relationships, and the process of defining how tasks or behaviors should be performed (Malmi & Brown, 2008).

We argue that the abovementioned management controls of sexual harassment have not been able to stop sexual harassment, first because the focus of the implementation of these preventive and corrective measures felt on symbolic compliance and legal protection and, second, because these controls, in themselves, are not the suitable instruments to prevent workplace sexual harassment.

Judicial interpretation of Title VII of the Civil Rights Act of 1964 has incentivized organizations to adopt sexual harassment policies, training programs, and internal reporting mechanisms with the idea of protecting an employer from legal liability. First in 1986 and then in 1998, the United States Supreme Court suggested that a legally sufficient harassment policy and a grievance procedure designed to manage sexual harassment complaints might shield an employer from liability. Since then, consultants and lawyers have guided organizations to develop policies and procedures and awareness training required by the law, without considering the pitfalls of these interventions, and in the absence of empirical backup (Stockdale *et al*., 2004; Perry *et al*., 2009). Their focus lies more on symbolic compliance than

on the effective prevention of sexual harassment (Grossman, 2003). Organizations give little attention to whether these efforts are likely to reduce sexual harassment or redress the harm it creates, and all because, in the overwhelming majority of cases, the mere adoption of the abovementioned measures is enough to avoid employer liability (Rhode, 2019). Courts, indeed, consider them as part of a defense in most cases of hostile environment sexual harassment, unlike the cases of quid pro quo sexual harassment, where employers are automatically liable (Grossman, 2003; Perry *et al.*, 2009; Roehling & Huang, 2018). Since only a minority of victims' experience quid pro quo sexual harassment (Leskinen *et al*., 2011; National Academies of Sciences, Engineering, and Medicine, 2018; Kearl *et al*., 2019), policies and procedures, as well as awareness training provided by employers, play an essential role in guaranteeing them protection against complainants. Intentionally or unintentionally, organizations engaged in de-coupling. Indeed, there is scant evidence to show that the existing management controls of sexual harassment are linked to organizational effectiveness or outcomes. To some extent, policies and anti-sexual harassment practices are coupled. However, they produce a real outcome that does not correspond to the original goal of eliminating workplace sexual harassment (Clarke, 2020). Bromley and Powell (2012) describe this specific form of decoup-ling, which is distinguished here, as means-ends decoupling (synonymous: symbolic implementation).

In comparison to the decoupling of formal policy from daily practices theorized by Meyer and Rowan (1977), symbolic implementation foresees policy implementation in practice but with an unclear relationship to the outcomes. Part of the explanation for decoupling may be attributed to the following developments. First, American courts require the existence of sexual harassment policies and grievance procedures on paper only. An employer does not need to prove their effectiveness and fairness in reducing or eliminating workplace sexual harassment (Lawton, 2004; Edelman, 2016). Thus, employers are less likely to monitor and regularly evaluate if their internal prevention/response system successfully fulfills those tasks (Edelman

& Cabrera, 2020). Evidence of deficiencies concerning these management controls would undermine the defense that excuses an employer from liability or damages. Most employers, accordingly, prefer not going beyond symbolic compliance.

Furthermore, American private organizations may legally refuse to disclose information about their internal policies and procedures concerning workplace sexual harassment. This factor also allows explaining some of an employer's low willingness to monitor the implementation and effectiveness of policies and procedures, correct deviations, and learn from the latter. Access to this information is also restricted for researchers, with the direct consequence of affecting the possibility to determine the effectiveness and appropriateness of management controls of sexual harassment (National Academies of Sciences, Engineering, and Medicine, 2018).

To reduce legal liability in court, organizations myopically focused on the solutions of how to face workplace sexual harassment implied by courts, human resource professionals, and legal counsel. These solutions are institutionalized over time. In this regard, organizations' behavior has taken a path-dependent character (Sydow *et al.*, 2009). Institutional inertia emerged, partly because of the high costs incurred by organizations for the development of sexual harassment policies and procedures as well as for the provision of awareness training (Roehling & Huang, 2018), and partly because of the costs that organizations may additionally bear to introduce different and effective management controls of sexual harassment. The benefits that these solutions bring in terms of defense from liability to employers are also a decisive factor in choosing to stick with this specific path. The #MeToo movement is an example in support of this. Notwithstanding the large number of sexual harassment allegations that this movement has brought forward, organizations confined themselves to only minimally modifying or quickly creating policies against workplace sexual harassment, complaint procedures, and awareness training if they have not done it so far (Edelman & Cabrera, 2020).

Taking into account all of the above, we may add that management controls of sexual harassment emphasize the actions that victims and employers can take ex-post to respond to incidents of sexual harassment, rather than highlighting what organizations and individuals should do ex-ante to avoid those incidents. A legally sufficient policy looks like this (Grossman, 2003): it entails a (legal) definition of sexual harassment (accompanied by a few examples of this behavior, if deemed necessary); it designates the persons responsible for receiving complaints of sexual harassment; and it foresees a formal complaint mechanism. Sexual harassment training for managers and employees does not differ much from a formal policy. Similarly, the training addresses the legal definition of what constitutes sexual harassment, clarifies how to identify, respond to, investigate or, correct sexual harassment, and points out the existence of a grievance procedure established to assist the victims (Roehling & Huang, 2018). These controls have little to do with the concept of prevention. Courts can consider them as adequate prevention, but these measures are far from reality, and the evidence supporting their suitability is little (Quick & McFadyen, 2017).

The abovementioned management controls have been carried forward without considering how most victims respond to sexually harassing behavior, how this inappropriate behavior manifests itself, and why harassers decide to initiate sexual harassment actions (O'Leary-Kelly *et al*., 2000). Only some victims use the employer's internal complaint procedure or report their experiences with sexual harassment to supervisors or managers at work (Fitzgerald *et al*., 1995b; Clarke, 2014; Rhode, 2019). Most victims ignore or deny the harassment, downplay the incidents, or avoid the harasser (Gutek & Koss, 1993; Knapp *et al*., 1997; Welsh, 1999; Malamut & Offermann, 2001). Much of the reason why victims never take formal actions is that complainants often face retaliation, are ignored, discredited, and even demoted (Bergman *et al*., 2002; Cortina & Magley, 2003; Dobbin & Kalev, 2019). Other reasons are the lack of confidentiality and negative perceptions of organizational justice (Adams-Roy & Barling, 1998; Grossman, 2003). In other situations, staff members are more concerned with protecting the

rights of perpetrators, and as a result, discourage potential complainants from pursuing their complaints (Edelman & Cabrera, 2020). The rules of liability for sexual harassment require such incidents to be investigated within organizations before bringing a lawsuit to court. If victims fail to make correct use of the internal grievance procedures, they lose legal protection and are deprived of compensation for sexual harassment. A generalized fear of retaliation is not considered a justification for failing to report sexual harassment (Grossman, 2015). The current legal structure offers the perpetrators a better degree of protection than the victims (Peirce *et al*., 1998).

Similarly, anti-harassment training programs on laws and policies may satisfy legal duties, but they remain ineffective in reducing abusive behavior (Lipnic, 2016; Chang *et al*., 2019). Although sexual harassment training can have positive effects, such as imparting knowledge and skills, increasing understanding of what constitutes sexual harassment, or leading to better recognition of situations as being sexual harassment, it fails to influence values and attitudes (Clarke, 2020). This is partly because existing sexual harassment training does not help those who are most likely to sexually harass to understand victims' subjective experiences and take their perspectives. Contrariwise, research shows that existing sexual harassment training may amplify the problem and make the harassers more likely to blame their victims (Bingham & Scherer, 2001; Tinkler, 2012). Another disheartening fact is that since the group that experiences most sexual harassments are women, most of the training sessions are addressed to a male audience, which unfortunately shows signs of resistance (Kearney *et al*., 2004).

Duty-based ethics in the workplace

The legal definition of workplace sexual harassment and its legal interpretation focus on the consequences of the action rather than the action in itself. In other words, the consequences of workplace sexual harassment are widely used to judge its appropriateness. The degree of severity and frequency are decisive in determining whether an action or behavior constitutes sexual harassment (especially in the case of hostile environment sexual harassment) (Wiener & Hurt, 2000). So, for instance, hostile environment sexual harassment is not recognized as such if it is not sufficiently severe or pervasive (Roehling & Huang, 2018). This loophole is a major reason that allows workplace sexual harassment to continue.

One should not underestimate the legal definition of sexual harassment and its well-established judicial interpretation. They have played their role in the creation and diffusion of awareness training, policies, and procedures, thereby shaping the way through which to deal with sexual harassment at work. Regrettably, even though the law's definition relies on the consequences of sexual harassment to decide on this conduct's rightness, it has not established sexual harassment as an ethical issue, and neither have organizations. Thus, this narrow and seemingly consequentialist perspective of positioning sexual harassment has neglected to call attention to the moral facet of this behavior (Tenbrunsel *et al*., 2019).

In this paper, we refer to sexual harassment as an unethical act per se. We further suggest that not the harmful consequences render sexual harassment unethical, but that it is wrong per se. Sexual harassment should be eliminated unconditionally, not because of the negative individual-level or organizational-level outcomes. This claim and the following are made on a deontological basis. Deontology or duty-based ethics is a theory that looks to the moral rights and obligations rather than any particular outcome (Gibson, 2000). According to what a duty-based approach contends, it is possible to argue that organizations have certain moral duties to their employees by virtue of their positions (Freeman, 1997; Lahdesmaki, 2005). As one of the stakeholder groups, employees are entitled to perform their duties in a safe and healthy work

environment. Organizations ought to guarantee these rights even if they are costly in terms of time and money (Gibson, 2000). To remind organizations about their obligations and raise awareness of business ethics, stakeholders themselves have taken a stand and called for proactive responses with regard to the social performance of an organization (Eweje & Wu, 2010). External, as well as internal stakeholders, have certain expectations about the management of social issues, such as sexual harassment. In this regard, organizations are recommended to meet societal expectations if they do not want to face stakeholder pressure, which might not be favorable for the reputation (Brammer & Pavelin, 2005). Consequently, organizations shall move beyond what is legal and make the necessary adjustments to their existing strategy of combating workplace sexual harassment. In this respect, organizations might take into consideration the potential of applying nudges as an alternative or additional tool to support the management controls that address sexual harassment at work.

Understanding Nudges

The definition of nudge

Thaler and Sunstein (2008: 6) describe a *nudge* as "any aspect of the choice architecture that predictably alters people's behavior without forbidding any options or significantly changing their economic incentives". *Choice architecture* refers to the environment in which choices are structured to manipulate individual behavior. In other words, a choice architect (e.g., the government) deliberately changes contexts to bring about a particular outcome.

As opposed to some traditional intervention tools – such as negative or positive incentives, restrictions, bans, or mandatory rules – a nudge intervention shall keep all options open and not make some of them less or more convenient from an economic point of view. Everyone shall be able to decide what they prefer without hindrance, and freedom of choice shall remain intact (Thaler & Sunstein, 2008).

Management controls of sexual harassment make use of direct instruction and enforcement, quite always with the threat of punishment, to guide individual behavior in the direction determined by the law. Policies and awareness training emphasize that sexual harassment is prohibited by law and that employees should not engage in sexual harassment precisely for this specific reason and not for others. Otherwise, sanctions and disciplinary measures will apply. Nudges, instead, would enable people to improve themselves, their thinking, and decision-making by changing the environment in a way that individuals are more likely to make decisions that are appreciated. In the following, we will describe how nudges differ from the traditional management controls of sexually harassing behavior.

Nudges and the functioning of the human mind

Nudging theory builds on the premise that humans are *homo sapiens*, not *homo oeconomicus* (Simon, 1955; Tversky & Kahneman, 1974). This theory assumes that humans do not always act rationally: most of them are predictably irrational instead (Ariely, 2009). Human behavior is considered to be the result of the interaction of two cognitive processes, also called dual-system thinking: one, which is fast, effortless, intuitive, emotional, and operates unconsciously (automatic / irrational thinking), and another, which is slow, effortful, subject to logic and controlled (reflective thinking). Most decision-making is subconscious for various reasons (Bargh *et al*., 2001; Kahneman, 2003): people possess limited decision time and imperfect information; in addition, they have limited attention span and information processing capacity. Therefore, mental shortcuts – distinct synthetic and abbreviated reasoning procedures – often influence their decisions leading to systematic errors in thinking known as *cognitive biases* (Kahneman, 2003). Outcomes of such decisions are sometimes suboptimal or harmful to oneself or others.

Nudges aim at influencing the automatic system of thought (Hansen & Jespersen, 2013). This system of thinking can shape human behavior on its own or indirectly. In the latter case, the automatic thinking prompts the reflective system of thought to check and confirm the output generated by the automatic one: the two systems of thought work in tandem.

By exploiting the same flaws in thinking that lead humans to behave in a non-optimal way, nudges can steer people to an either individually or socially desired behavior without letting them explicitly know that they are being nudged (Hansen, 2016). In this case, nudging would affect only the automatic mode of thinking. However, not all nudges take advantage of cognitive obstacles. It means that not all nudges exploit people's irrationality; instead, they stimulate people to improve the quality of their choices, encouraging active and deliberate thinking (Vallgårda, 2012). In this case, nudging triggers both modes of thinking, which consequently find themselves interacting. In doing so, nudges try to correct and/or eliminate cognitive biases which result from irrational thinking or overthinking.

Behavioral ethics researchers believe that much of human unethical behavior has its roots in the automatic mode of thinking (Moore & Loewenstein, 2004; Drumwright *et al*., 2015). They argue that individuals can engage in unethical actions without being aware of them. The automatic system of thought handles allegedly 95% of decisions. This system initially seems to produce an outcome that would benefit the decision-maker itself, emphasizing self-interest (Feldman, 2014). Instead, the reflective mode of thinking monitors the automatic self-interest and sometimes intervenes to modify or reject the output generated by the automatic system of thought (Kahneman, 2003). If one pursues this line of reasoning, then sanctions and related disciplinary measures foreseen by the sexual harassment policies are struggling to eradicate unethical behavior. Current management controls of sexual harassment appeal to the threat of sanctions to ensure compliance. They are conceived in such a way that sanctions should prevent compliance violations because it is expected that people will react in a rational and positive manner to these threats. Differently from what is assumed, sanctions have been often unable to

deter or adequately punish wrongdoing (Bergman *et al*., 2002; Rhode, 2019). On the one hand, this happens because tools for management controls that include sanctions address the reflective decision-making system and cannot account for the reflexive and habit-bound reactions governed by the automatic system of thought. On the other hand, the human factor is another source of failure, which damages the credibility of zero-tolerance sexual harassment policies and related instruments. Sometimes organizations avoid the punishment prescribed by their sexual harassment policies and resort to other means (e.g., therapy or training) (Edelman *et al*., 1993). Nudges, on the contrary, harness the automatic mode of thinking to prevent individuals from acting in their self-interest. Nudges focus on automatic motivational mechanisms intended to reduce the motivation to misbehave (Vlaev *et al*., 2016).

Nudges work because they profit from important features of how the human mind functions. According to the perceived level of intrusiveness, some nudges have a low or no impact on decision-making autonomy, such as the supply of information, feedback, social norms, reminders, and commitment devices; others reduce more individual autonomy, such as defaults, framing devices, physical and social design of the decision-making context, and visual manipulation.

Governments have implemented nudges in the context of public policies. They aim at improving citizens' behavior, especially in the field of health care. Social norming has proven to decrease alcohol consumption effectively, increase hygiene awareness, and foster healthy lifestyles (Vlaev *et al*., 2016). It works because social influence plays a crucial role in conditioning our behavior. Presenting organ donation as a preselected opt-out system (default) increased the numbers of organ donors (Johnson & Goldstein, 2003; Matjasko *et al*., 2016). Status quo bias or inertia causes most people to stick with the opt-out default. Reminding individuals about upcoming commitments by email or text message helps to increase participation in cancer screening and influenza vaccination (Matjasko *et al*., 2016). Individuals can overcome social laziness and procrastination with the help of pre-commitment devices

without or in combination with monetary contributions. They encourage people to engage in an initiative and reach their goals. Because of the phenomenon of loss aversion, this way people could quit smoking or lose weight (Matjasko *et al*., 2016). Furthermore, presenting choices in a positive manner (emphasis on gain or positive framing) may encourage healthy behaviors (Engelen, 2019).

However, governmental nudges are conceptually distinct from nudges for preventing unethical and illegal behavior in private organizations (e.g., sexual harassment). While the former focuses on eliminating the impediments to realizing rational self-interests, the latter exploit these impediments with the purpose of not allowing individuals to act self-interestedly (Haugh, 2017). This work is interested in private nudges designed to tackle workplace sexual harassment.

Nudging and Sexual Harassment – A Conceptual Framework

This section presents a framework designed to discourage sexually harassing behavior in the workplace and instead promote a safe and healthy work environment. The framework consists of several nudging mechanisms clustered in five overall categories. The criterion used to determine the best-fitting nudging mechanisms and the final categories are based on the target groups in sexual harassment. All in all, we propose the following five target groups as being relevant to be nudged: top, middle, and line management, harassers and potential harassers, observers, victims, and finally, society.

Through a thorough analysis of the accumulated body of literature on sexual harassment and nudging interventions, we aimed at capturing those nudging mechanisms that would better suit the purpose of the framework. Drawbacks of previously adopted management controls of sexual harassment, as well as recommendations from the law and social science, have also contributed to shaping the structure of the proposed framework. We focused on nudging mechanisms that have been shown to succeed in improving individuals' behavior, especially in

the field of environmental and health protection. As a result, we analyzed, translated, and adapted examples of nudges from other domains to the context of sexual harassment.

As stated above, the framework addresses five target groups. In the next few lines, we define each of them separately. The target group *Top, middle and line management* could fit into the residual four categories, meaning that a manager could be a harasser, victim, or observer of sexual harassment incidents. However, when we consider *Top, middle and line management* as a distinct, independent category, we refer to managers serving as role models for others in the organization. Due to managers' broader visibility in the organization, their attitude and behavior towards sexual harassment, their level of engagement as well as the credibility of their efforts play an important role in affecting employees' decisions to sexually harass (Bell *et al*., 2002; Offermann & Malamut, 2002; Tenbrunsel *et al*., 2019). Therefore, with a view on management's position in the organizational hierarchy, a respective category is dedicated to it. The category *Harassers and potential harassers* comprises the following possible perpetrators of workplace sexual harassment: managers or persons of higher status, subordinates or persons of lower status, peers or colleagues at a similar grade, customers, clients, or visitors. The category *Victims* refers to employees who suffered sexual harassment at work or anyone in the workplace affected by the abusive behavior. The victim can be either a woman or a man, heterosexual or LGBTQ (lesbian, gay, bisexual, transgender, and queer) person, and the victim can be of the same sex as the harasser. The category *Observers* is composed of individuals who witness sexual harassment occurring but are not directly involved in the incident (Bowes-Sperry & O'Leary-Kelly, 2005). The fifth category *Society* is an interconnected group of individuals involved in constant social interaction, in which the behavior of each individual is influenced by the decisions, choices, attitudes, or behaviors of others (Thaler & Sunstein, 2008).

Top, middle and line management

Top and lower-level managers play a major role in the diffusion and acceptability of sexual harassment at work. Managers may not always correctly and promptly respond to incidents of sexual harassment (as stated in the sexual harassment policies). They may ignore or belittle the incident, delay the internal investigation, fail to recognize the incident as sexual harassment, be prone to protect the accused rather than the victim, or they may be involved in sexual harassment themselves (Offermann & Malamut, 2002; Tenbrunsel *et al*., 2019; Edelman & Cabrera, 2020). Managers who perform questionable behavior are not only damaging the credibility of organizations and the management controls of sexual harassment established by them but also encouraging and negatively influencing the future amount of sexual harassment.

Two particular nudges could ensure that managers engage in eliminating sexual harassment, namely reminders and commitment nudges. *Reminders* remind people of their upcoming commitments or obligations. *Commitment nudges* encourage people to engage in a promised course of action. While reminders address limitations in people's self-control, memory, and attention (Vervloet *et al*., 2012), commitment nudges are ways to combat procrastination and inconsistency in promises and actions (Vlaev *et al*., 2012). For instance, reminding patients about upcoming appointments by email, SMS or postcard, helps to increase participation in cancer screening, flu vaccination (Matjasko *et al*., 2016), and dental check-ups (Altmann & Traxler, 2014). Similarly, getting patients "to verbally repeat a scheduled appointment with their doctor prompts decisions in consistency with the agreement made" (Caraban *et al*., 2019, p.7). One way to alter the choice architecture and possibly induce behavioral change is to require management to sign honor codes or declarations they will not engage in sexual harassment and periodically remind them of the commitment and responsibility they have taken on themselves. When people are reminded of their ethical duties, they are more to uphold them (Shu *et al*., 2011). The reminders' goal is to restrain forgetfulness (Damgaard & Gravert, 2018). They aim to reinforce ethical behavior by increasing the presence

of commitments in individuals' thinking, thus bringing the issue of sexual harassment to attention. Wrong use of reminders may have the opposite effect. Hence, there are several considerations to keep in mind when designing reminders: timing, frequency, and personalization. Reminders should draw managers' attention at appropriate times, the frequency of the intervention should be monitored and adapted, if necessary, and finally, reminders should fit the situational context (Damgaard & Gravert, 2018).

Another approach of nudging managers is to require them to make public their commitments to ensure that sexual harassment policies are taken seriously, and that complaint procedures provide meaningful redress for the suffered sexual harassment. This approach taps into the commitment bias. It exploits individuals' desires to maintain a coherent and favorable self-image. Hence, to avoid reputational damage, they are likely to keep commitments or public promises, even in cases where this is not beneficial for them (Staw, 1981). Commitment nudges leverage public commitment to increase the cost for managers of engaging in inappropriate behaviors or avoiding the fulfillment of organizational duties.

Harassers and potential harassers

Nudges in this category would attempt to refrain harassers and potential harassers from committing sexual harassment. We propose the implementation of three particular nudges, which we refer to as risk information, framing, and empathy nudge (Caraban *et al.*, 2019; Slovic *et al.*, 2007; Tversky & Kahneman, 1981). Providing *risk information* pursues the purpose of describing the risk and the resulting consequences of some behavior. It addresses the limited attentional resources and cognitive processing capacity that humans possess and tries to enhance their rationality (Caraban *et al*., 2019). *Framing* refers to the presentation of a given choice in negative or positive terms. It exploits the wording of communications to manipulate behavior through emotional influence (Tversky & Kahneman, 1981). *Empathy nudges* prompt individuals to think of their effect on others. They take advantage of the fact that humans' first

responses to specific stimuli are affective, and this can have a powerful effect on decision-making (Slovic *et al*., 2007). For instance, in a field intervention, it was possible to ascertain that providing information on the relative risk of HIV (human immunodeficiency virus) infection by the age group of the sexual partner resulted in a 28% decrease in teen pregnancy and an even higher decrease in the incidence of pregnancies with older, riskier partners (Dupas, 2011). Negatively-framed messages increase mammography and HIV test rates; gain-framed messages are beneficial to encourage people to do physical exercise (Salovey & Williams-Piehota, 2004). Finally, emotionally engaging visualizations stimulate feelings of empathy and can motivate children to embrace pro-environmental behavior (Dillahunt *et al*., 2017). We elaborate on the tree approaches in the following.

Risk perception is an important factor in the decision-making process. Slovic (1987) defines risk perception as one's subjective judgments about the characteristics and severity of a risk. People's decision-making accuracy tends to improve when they perceive a certain risk level (Samuelson & Zeckhauser, 1988). They are more likely to reflect upon their behavior and how it impacts their future. Therefore, it is advisable to increase the awareness of the risks of sexually harassing behavior among all members of an organization. Reminding of the consequences for harassers and potential harassers might break mindless behavior and prompt a reflective choice (Caraban *et al*., 2019). Employers do not always clearly and regularly communicate the sexual harassment policy to their workforce so that everyone is continuously aware of the risk involved in committing sexual harassment. In the same way, employers conduct training about sexual harassment only for a couple of hours in a year, which may not be enough. As a result, employees, as well as managers and supervisors, may underestimate the probability and the severity of punishment if they cannot readily recall or perceive the risk associated with sexual harassment (Tversky & Kahneman, 1974). A way to counteract this may be to provide examples relevant for the target – real-life examples of sexual harassment occurred within or outside the workplace under consideration and straight away sanctioned –

that would be able, first, to signal to harassers and potential harassers the actual risk of engaging in sexual harassment and, secondly, to stay in their mind for a long time.

A further approach to deter sexual harassment would require framing the sexual harassment costs that organizations incur (costs related to employee turnover, increased absences, reduced productivity; costs of investigating complaints, and legal costs arising from cases against the organization) in terms of personal losses for the harassers and potential harassers. Alternatively, organizations may use positive framing to stress the gains associated with not engaging in sexual harassment. Given that the impact on a particular behavior of a framed message varies if the emphasis is put on gain or loss, the decision whether to accentuate the positive or accentuate the negative should be based on evidence from empirical studies to guarantee the effectiveness of the nudge. This type of framing manipulation is inspired by the one labeled as *goal framing* and developed by Levin *et al*. (1998). While the latter use positive framing to stress the positive consequences of performing an act and negative framing to stress the negative consequences of not performing it (Levin *et al*., 1998), the type of framing meant for the issue with sexual harassment would highlight the gains arising from not committing sexual harassment and the losses resulting from perpetrating it. Such framing aims to affect the reflective choices of harassers and potential harassers by triggering the automatic thinking through the medium of emotional associations or feelings connected with the frame. The automatic thinking will then inform the reflective thinking and should desirably steer it to opt for the desired behavior (Hansen & Jespersen, 2013).

The last approach focuses on raising empathy with the victims of sexual harassment. This may be achieved by helping the perpetrator take the victim's perspective – and namely, imagining to be in the victim's situation and trying to understand how they feel. Previous research provides evidence that empathy can temper discriminatory behavior, such as bullying and sexual aggression (Diehl *et al*., 2014). Moreover, empathy weakens self-interest (Czap *et al*., 2015). Empathy may not only have the potential to persuade perpetrators to change their

abusive behavior but also to increase their intentions to help victims and even take action against future incidents of sexual harassment they may assist to (Shelton & Rogers, 1981; Diehl *et al*., 2014).

Observers

Research supports the idea that disclosing emotionally charged information about oneself can improve long-term health well-being (Pennebaker & O'Heeron, 1984; Sherman *et al*., 2000). However, when individuals experience social rejection from disclosure confidants, they show diminished psychological well-being (Major *et al*., 1990; Ullman, 1996). Similarly, when observers witness incidents of sexual harassment and do not take any action, the negative consequences for victims are amplified (O'Leary-Kelly *et al*., 2009).

Individuals who observe sexual harassment seldomly intervene to discourage the harasser from engaging in the conduct again or help the target (O'Leary-Kelly *et al*., 2004). Bowes-Sperry and Powell (1999) found that observers are more inclined to take direct action when they identify the conduct as high in moral intensity and thus consider it an ethical issue. Bowes-Sperry and O'Leary-Kelly (2005) suggest manipulating moral intensity in a manner that observers respond helpfully and actively to sexual harassment.

One force to reframe sexual harassment as an ethical issue and thus increase the willingness to help may reside in *storytelling* as a form of nudging (Wood, 1992; Martin, 2016). Storytelling – in the shape of visual stories – communicates information and inspires people to act. When people are exposed to particularly engaging or exciting stimuli, some processes associated with the readiness to help or act to fix a problem get activated (Zak, 2014). For instance, visual stories can motivate people to reduce their plastic waste (Ortblad, 2019). The use of visual stories – during, e.g., awareness training sessions – may contribute to encourage observers (who will happen to witness or hear about sexual harassment) to support victims, block future sexual harassment, and in this way to help achieve a pleasant work environment.

Employers should choose those stories that are more likely to trigger a behavior change. Choosing the right approaches would mean ensuring that targets overcome individual blocks, such as the fear of doing something wrong, or the uncertainty concerning intervention responsibility (Bowes-Sperry & O'Leary-Kelly, 2005; Ryan & Wessel, 2012).

Victims

Victims of sexual harassment are not always willing to deal with the sexual harassment they have experienced (see above). However, if the management in organizations sincerely commits to building a culture of respect and inclusion for all employees, victims of sexual harassment should regularly be informed that they will get support. To make sure that this information will have a marked impact on the target, organizations could play around with the source of information. In this respect, we have in mind the technique known as *messenger* (Dolan *et al*., 2012). The choice of the messenger heavily influences the recipient's response to that information. This technique focuses on the automatic reactions people have toward sources that disseminate information. The reactions can vary according to the perceived authority or credibility of a source, the similarity between source and receiver, and the feelings a receiver has for the source of a message (Dolan *et al*., 2012). For instance, a meta-analysis of 166 HIV prevention interventions showed that expert interventionists were more effective in changing behavior and that recipients were more likely to accept the information in the cases in which it was reported demographic and behavioral similarity between them and the interventionists (Durantini *et al*., 2006).

In this respect, employers should proactively inform employees about available (internal and external) reporting tools and provide them with a clear guide to help them navigate their way during the period they are suffering sexual harassment. The source of this information should be someone in which employees have confidence (a credible source). A message from the CEO (chief executive officer) – if he or she is authoritative and enjoys a good reputation –

can be more powerful than a passing reference to the complaint mechanisms during the sexual harassment training. However, it does not necessarily have to be the CEO or just one person. If it suits the context and seems feasible and necessary, one could diversify the messengers and designate several of them, one for each department/team.

Society

Organizations should reposition sexual harassment from a problem that infrequently occurs to one that is likely to arise and make it a societal problem. Organizations can move toward better transparency and enhanced sexual harassment awareness both in the workplace and beyond with the aid of social influence nudges. These nudges use to good advantage the fact that what other people around us do or think it is right to do has a strong influence on our behavior. When people are unable to determine the appropriate conduct, they tend to pay attention to others' conduct and search for social proof (Cialdini, 2007). For instance, an experiment shows that by emphasizing the number of people who do not drink rather than those who engage in this behavior, social influence nudges that use social norms can be effective in changing risky drinking behavior (Perkins *et al*., 2010).

In addition, there is evidence that information disclosure has fostered competition among organizations keen to display their green credentials (Thaler & Sunstein, 2008). To avoid bad public attention or looking, or doing worse than the competitors, organizations have replicated others' actions, namely, disclosing and simultaneously improving their corporate social responsibility (CSR) performance. A wise move would be to publish audits, rankings, or statistics about sexual harassment in the same vein. If sexual harassment is something they have under control, organizations should make this information accessible and share their positive changes and constructive achievements. As a likely consequence, other organizations will probably try to imitate this practice, which first implies successfully tackling sexual harassment inside the organization itself.

There is a conclusive point that is worth mentioning. When it comes to designing nudges, one aspect to keep in mind is seizing the possibility of combining visual and verbal communications. The usage of visual language (i.e., pictures, moving images, drawings, color, typography) can serve as an enrichment to verbal language for the construction of meaning (Meyer *et al*., 2013). Another aspect is that interventions should fit the cultural and situational context of organizations. Figure 1 illustrates the interrelation of the target groups and outlines the proposed nudges to overcome the issue of workplace sexual harassment.

--- PLEASE INSERT FIGURE 1 ABOUT HERE ---

Conclusion

The objective of this paper was to understand how organizations could prevent workplace sexual harassment beyond existing law and preventive/corrective practices from management control systems. We provide theoretical and practical insights. From a theoretical perspective, researchers have been continuously underlining the destructive consequences of sexual harassment on victims, observers, and organizations (O'Leary-Kelly *et al*., 2009). Despite decades of research, answers to the sexual harassment issue in the workplace are surprisingly unsatisfying. Prior research has studied the occurrence of sexual harassment from several angles, however, without a unified view. Researchers lack a clear and widely supported theory for why sexual harassment occurs (McDonald, 2012). This eclecticism is one of the main impediments to the progress in addressing workplace sexual harassment. It is necessary to integrate the existing bodies of scholarship. So far, these comprise compliance (legal research) as well as management control systems (business research). Organizations have adopted sexual harassment policies, training programs, and internal grievance procedures mainly to reduce employer liability in court and not necessarily sexual harassment (Edelman & Cabrera, 2020). Traditional legal compliance and management control systems address the symptoms, but not the causes of workplace sexual harassment. We propose new possibilities for theorizing sexual

harassment. In particular, we extend this stream of research by introducing insights from nudging (psychological research), as most decisions on sexual harassment are done without extensive reflection. Specifically, we present a framework of possible nudging mechanisms that address the principal actors involved in or related to workplace sexual harassment: top, middle, and line management, harassers and potential harassers, observers, victims, and society. Each of them is of equal importance, and the oversight of even one of them may undermine the efforts to stop sexual harassment. That is why every category of actors needs to be effectively nudged, and the nudge interventions should be suitable for the respective target.

From a practical perspective, we transfer insights from nudging (mainly from health sciences) to a business context and propose concise actions organizations may take to prevent workplace sexual harassment. Nudging is diffused in many domains and enjoys success in tackling several inappropriate and harmful behaviors, such as alcohol and cigarette addiction, unhealthy eating habits, poor hygiene, mindless water use, or unreasonable energy consumption. Specifically, we suggest a different set of nudges between each relevant stakeholder group and the organization.

Our newly developed framework is not without limitations, which pave the way for future research. First, the persisting fuzziness in sexual harassment research can make it challenging to develop concise tools to prevent workplace sexual harassment. Our ideas need further input from actually implemented nudges and their effectiveness to develop the framework further. The absence of solid evidence about these efforts' effectiveness are aspects that researchers repeatedly highlight in their works. We can advance this field of research if we investigate the reasons for dysfunctional behavior and make suitable, constructive suggestions to fix the problem, instead of focusing on the drawbacks of preventive and corrective measures. Our work may be a basis for discussion and further research in the sexual harassment area. Researchers could analyze the effectiveness of nudges against sexual harassment in laboratory or field experiments. They might want to test empirically if there are any conflicts or complementarities

between nudges. Second, nudges have far wider applicability than just preventing sexual harassment. Future research may produce a similar framework of nudging to tackle other inappropriate behaviors, such as mobbing. Third, our suggestions are not conclusive. The proposed nudges are just some of the many that organizations might consider. We hope that the initial examples of nudges provided in this paper will be of inspiration to organizations, so they will rethink their traditional legal and business-focused approach to preventing sexual harassment. This undertaking will require strong cooperation among researchers, practitioners, policymakers, and other involved stakeholders.

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Figures

Figure 1: Conceptual framework of organizational nudges to overcome workplace sexual harassment

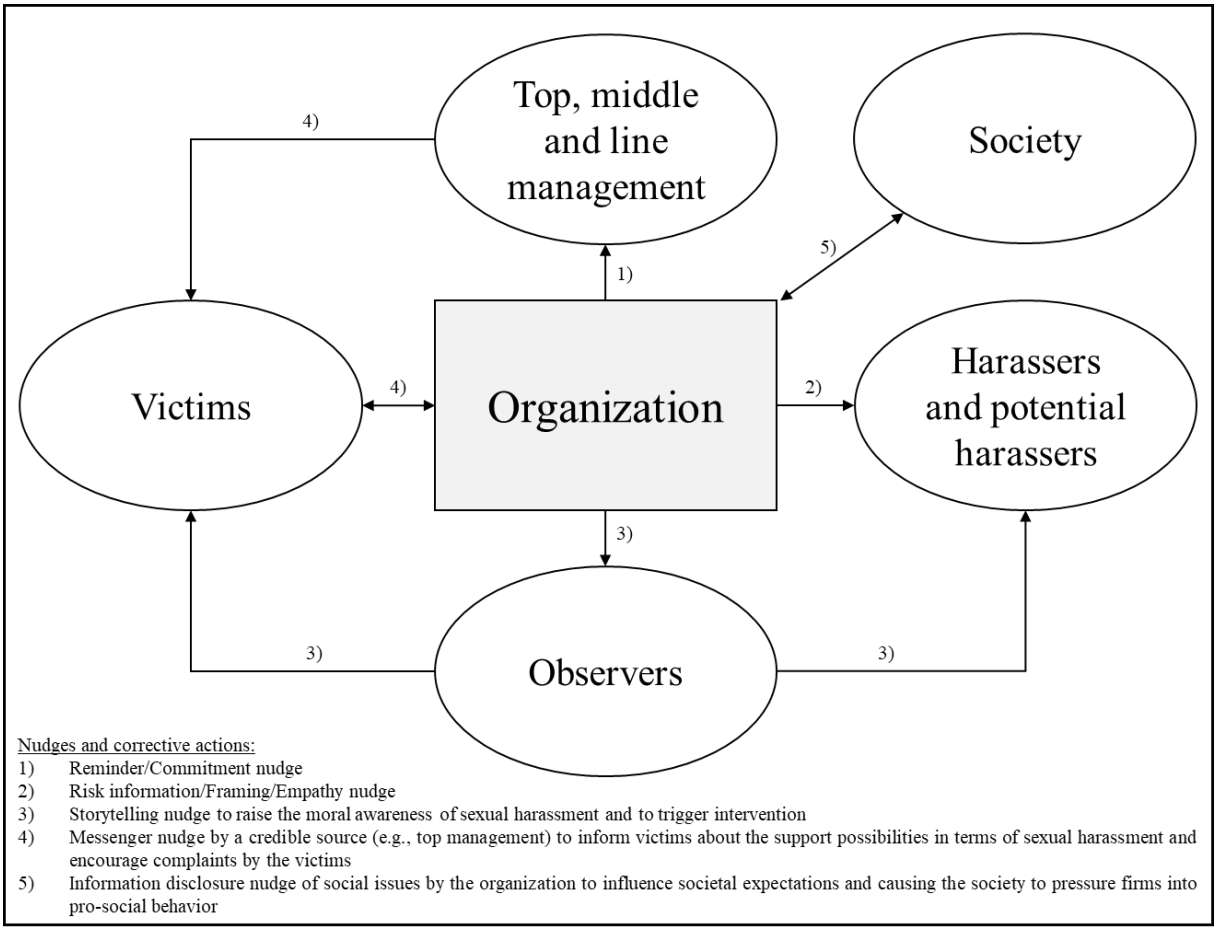

Figure 1 illustrates the conceptual framework developed in this paper. Thereafter, we identified 5 nudges targeting several organizational stakeholders and provide short explanations that help to overcome the issue of workplace sexual harassment.

8 Conclusion

Summary of the findings

This thesis first aimed to answer the question of how investors react to incidents of organizational misconduct. To this end, four distinct articles have been prepared that address different types of organizational misconduct.

The first article of this thesis represents an SLR that systematically summarizes the findings on the stock price reaction to environmental misconduct. Unsurprisingly, the extant literature provides a homogeneous picture in that regard and generally concludes stock market penalties for polluting firms. However, the SLR also concluded substantial differences concerning research emphasis on different subjects relating to environmental violation (Bosch et al., 1998; Dasgupta et al., 2006; Lanoie et al., 1998), pollution (Gupta & Goldar, 2005; Hamilton, 1995), accident (Blacconiere & Patten, 1994; Capelle-Blancard & Laguna, 2010; Carpentier & Suret, 2015), and multifaceted disclosures (Dasgupta et al., 2001; Flammer, 2013). Furthermore, the SLR revealed that the extant literature in this field tends to limit the theoretical framework to an efficient market perspective (Fama et al., 1969), thereby, potentially neglecting other theoretical mechanisms in place that help to explain the respective stock market reactions and a potential spillover effect. Finally, reviewing the methodological rigor revealed that many studies exhibit methodological flaws with regard to various elements of the event study method (MacKinlay, 1997). The knowledge derived from this SLR has been employed in later empirical studies to enhance the subject view, the theoretical underpinning, and the methodological rigor.

Directly adjoining the SLR, the second article of this thesis comprises an event study of the VW diesel emissions scandal (Dieselgate). In this study, taking an information economic approach, we have concluded that Dieselgate did affect not only the stock returns of VW but also those of other German car manufacturers (Daimler, BMW). Surprisingly, we found that

VW has only been penalized by the investors for the initial Dieselgate announcement by the US-EPA, while the other car manufacturers have experienced a severe contagion effect over time (Bouzzine & Lueg, 2020). This finding comprehensively confirms other research on this specific case of Dieselgate (Fracarolli Nunes & Lee Park, 2016; Jacobs & Singhal, 2020; Wood et al., 2018) and environmental violations in a broader sense (Bosch et al., 1998; Dasgupta et al., 2001; Lanoie et al., 1998).

In the third article of this thesis, we account for the social dimension of sustainability by examining workplace sexual harassment and the consecutive #MeToo movement as underlying events. In this study, we examined how sexual harassment accusations against executives affect their affiliated firms. Drawing on upper echelons (Hambrick & Mason, 1984) and reputation capital theory (Rindova et al., 2010), we find that firms are indeed penalized by the investors when their executives are accused of sexual misconduct. However, the findings are only significant for those executives who are affiliated with the parent organization. We conjecture that a strong association between the accused executive and the parent organization as well as a high degree of managerial power are necessary for the accusation to negatively affect the stock performance of the affiliated firm.

To account for the governance dimension of sustainability, we have examined the 2003 blackout in the US in the fourth article, which was a consequence of severe human and security system failure. Testing market efficiency, we have analyzed whether the market could identify the firm responsible for the blackout. Our findings illustrate that investors were indeed able to identify the responsible firm and penalized the stock of FirstEnergy substantially only three days after the blackout.

With regard to RQ2 and RQ3, this thesis was also concerned with the conceptual assessment of cognitive biases leading to organizational misconduct and the functionality of preventive measures, thereby highlighting the role of individuals.

In the fifth article of this thesis, we account for the antecedent dimension of organizational misconduct by conceptualizing how managerial cognitive biases might lead to organizational misconduct. Therefore, we specifically regard moral licensing as the underlying cognitive bias that leads managers to self-attribute the right to act unethically through the means of moral credit and moral credentials. We then argue that the series of unethical acts causes an institutionalization in the firm that will ultimately lead to organizational misconduct.

Finally, in the sixth article, based on what has been found in the event study of workplace sexual harassment, we have conceptualized the functionality of organizational nudges to overcome workplace sexual harassment. Therefore, we identified five relevant stakeholders in workplace sexual harassment (Top, middle and line management, harassers and potential harassers, observers, victims, and the society) and provided relevant organizational nudges to each of these groups. These help to enhance the awareness of the risk of workplace sexual harassment and eventually function as better preventive measures than traditional management control systems since they are better adapted to the unconscious nature of workplace sexual harassment.

As with the six articles, we comprehensively address the underlying research questions and provide evidence on how environmental, social, and governmental misconduct affects the stock performance of respective firms. Moreover, to shed further light on the nature of organizational misconduct, we conceptualized how cognitive biases such as moral licensing might lead to organizational misconduct afterward. In a further conceptual analysis, we elaborate on how to prevent workplace sexual harassment through the means of nudges. These conceptual analyses should help to deepen the understanding of organizational misconduct in a broader sense.

Limitations and recommendations for future research

This doctoral thesis discussed several aspects of organizational misconduct, focusing primarily on the stock performance outcomes, the antecedents, and preventive measures. In this section, I point out research gaps that were not addressed in this doctoral thesis. These are meant as directions for future researchers interested in examining the stock performance outcomes, individual antecedents, and preventive measures of organizational misconduct.

While I have critically assessed the empirical papers on the stock price reactions to organizational misconduct respectively and also assessed a relevant stream of literature within the SLR, I posit some general directions for future research in this area. In this thesis, I have relied solely on short-term event study methodology to derive performance outcomes of organizational misconduct. Thereby, it is inherent to that methodology that only the short-term effects within the event window are captured, not enabling any conclusions on medium-term and long-term effects of organizational misconduct (Corrado, 2011; Ding et al., 2018). To account for this research gap, I suggest that future researchers employ a longitudinal study design to analyze the performance outcomes of organizational misconduct. A longitudinal design would come with the advantage that potential corrective actions by firms are captured within the analysis (Hersel et al., 2019). In that sense, modifications to the classical short-term event study design based on daily stock returns can be undertaken that enable conclusions on long-term performance outcomes. Therefore, scholars could compute 'buy-and-hold abnormal returns' based on monthly, quarterly, or even annual return data and analyze how incidents of organizational misconduct and corresponding corrective actions are reflected in the long-term stock performance of underlying firms (Bremer et al., 2011; Lyon et al., 1999).

In terms of the antecedents of organizational misconduct, I critically assess that only a narrow perspective on this comprehensive stream of literature is covered in this thesis. Accordingly, future research might also cover other individual characteristics and cognitive

biases as antecedents of organizational misconduct in their analyses (Andreoli & Lefkowitz, 2009; Lefkowitz, 2009). In that regard, individual (and organizational) narcissism is (are) regularly seen as triggers and catalysts of misconduct, making it particularly relevant to research on organizational misconduct (Azizli et al., 2016; Brown et al., 2009; Duchon & Drake, 2009). Furthermore, future researchers might also be interested in examining the role of overconfidence as the underlying bias in the top-management team when examining the antecedents of organizational misconduct (Bianchi & Mohliver, 2016).

Finally, I again critically assess that the examination of preventive measures for organizational misconduct is limited in this thesis. While I have outlined how nudging might be a helpful resource in overcoming workplace sexual harassment, I did not elaborate on the functionality of nudging beyond this use case. As such, scholars also contribute to this discussion by outlining the potential influence of nudging on the environmental performance of firms, thereby, highlighting potential limitations (Hall, 2016; Hukkinen, 2016). Therefore, future researchers might conceptualize how nudging can help to enhance overall firm sustainability instead of limiting to distinct cases of organizational misconduct, such as workplace sexual harassment. Further, discussions on other relevant preventive measures in the area of misconduct, such as whistleblowing, have been omitted in this thesis despite receiving significant research attention (Mesmer-Magnus & Viswesvaran, 2005; Jubb, 1999; Oelrich, 2021). Future research should discuss preventive measures of organizational misconduct holistically to provide clear instructions to practitioners.

Concluding, I have provided research gaps to all three underlying dimensions of this thesis – stock performance outcomes, antecedents, and preventive measures – which should enable future researchers to effectively enhance this relevant stream of research based on what has been found in this thesis.

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