



Mismanagement of Sustainability: What Business Strategy Makes the Difference? Empirical Evidence from the USA

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Abstract

This paper examines whether and to what extent the overall business strategy influences the firm's mismanagement of sustainability. Specifically, an empirical measure for the mismanagement of sustainability is developed by exploiting the newly available materiality guidelines for US firms to define industry-specific material sustainability issues. Using this measure, this paper shows that mismanagement of sustainability can represent unethical business behavior when firms intentionally perform better on immaterial issues than on material issues by diverting stakeholders' attention from the firm's low overall sustainability performance. This paper assumes that the right business strategy can prevent such unethical actions. Based on Miles and Snow's (Organizational strategy, structure and process, McGraw-Hill, New York, 1978) organizational theory, this paper distinguishes between *Prospector* and *Defender* business strategies. By employing multiple firm-level panel regressions, the findings suggest that *Prospector*-type firms are more likely to mismanage sustainability issues compared to *Defender*-type firms intentionally. The results give implications for researchers, regulators and standard setters, auditors, sustainability practitioners, and scholars.

Keywords Business ethics · Business strategy · Corporate performance · Corporate social responsibility · Materiality · Strategic management · Sustainability

JEL Classification G3 · L2 · M1 · M2 · M3 · M4

Introduction

The concept of sustainability is defined in the Brundtland Report as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987, p. 43). In terms of corporate activities, sustainability refers to environmental, social, and governance (ESG) dimensions of a firm's operations and performance (SASB 2017). As such, it describes a firm's actions to manage its ESG impacts with a positive contribution to society. In this context, a growing number of firms identify

sustainability issues as strategically important and try to integrate sustainability issues effectively into their business strategies (Khan et al. 2016).¹ However, firms often pursue multiple business strategies that do not differentiate between more and less material sustainability issues (e.g., Porter and Kramer 2006; Eccles et al. 2012; Grewal et al. 2016; Khan et al. 2016).

Material sustainability issues are matters that reflect the firm's economic, environmental, and social impacts and have a substantive influence on the assessments and decision-making processes of stakeholders (GRI 2013; AICPA 2013; SASB 2015). As such, material issues are of particular interest of stakeholders since they have a financial and forward-looking impact on them (SASB 2016b). This particular stakeholder interest for special sustainability issues equally applies to corporate reporting, management, and investment decisions (SASB 2016b). Thus, the materiality of different

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¹ For purposes of this paper, the term “sustainability” is used interchangeably with terms such as “corporate social responsibility” and “corporate citizenship.” This practice is consistent with the work by Khan et al. (2016).

sustainability issues likely varies systematically across firms and industries (Eccles and Serafeim 2013; Grewal et al. 2016; Khan et al. 2016). For example, managing GHG emissions may be strategically important for some firms in specific sectors (e.g., transport and non-renewable resource sector), while diversity and inclusion issues are more likely to be strategically important for others (e.g., technology and communication sector). In the financial sector, for example, systemic risk management, fair marketing and advertising, business ethics and transparency of payments are defined as material sustainability issues (SASB 2016b). Immaterial for this sector are sustainability issues, such as fair disclosure and labeling, accident and safety management, product quality and safety, fair labor practices, employee health, and safety, as well as environmental issues (e.g., air quality, water, waste, and energy management) (SASB 2016b). Accordingly, the efficiency of the firm's implemented management practices on certain sustainability issues likely fluctuates with their materiality (Hauser Center 2012).

In this context, stakeholders increasingly demand transparency and accountability from firms about their real sustainability performance (Grewal et al. 2016). Stakeholders view issues, such as executive compensation, governance structures, environmental stewardship, community involvement, and employee relations as ethical issues (e.g., Heath 2006). As such, firms' decisions need to be ethical appropriate, even beyond legal requirements (Hitt and Collins 2007). While prior literature shows that ethical expectations can influence the strategic management of firms (e.g., Stevens et al. 2005), the influence of firms' business strategy on its ethical decision making in the sustainability context is under-researched. Although firms have started to undertake initiatives to highlight the importance of ethical decision making (Kelly 2005; Velthouse and Kandogan 2007), the question still remains if these entitled "ethical actions" are only of symbolic nature.

However, the materiality assessment process for sustainability issues is not regulated by law. For this reason, firms can self-assess the materiality of their sustainability issues, leading to inherent subjectivity in the materiality assessment (e.g., KPMG 2014; SASB 2014). Thus, the mismanagement of sustainability, i.e., the firm's incorrect handling of sustainability issues in terms of the discrimination between material and immaterial sustainability topics, can constitute an intentional or unintentional action. If firms conceal their bad performance on material issues by addressing and highlighting only immaterial issues in which they exhibit good performance levels, this misuse represents a strategic deception or confusion tactic in order to divert stakeholders' attention. However, prior literature finds that a large number of firms lack the capabilities and stakeholder engagement practices that enable identification of material sustainability issues even among the firms

that are highly experienced in sustainability management and reporting practices (Eccles et al. 2014; Miller and Serafeim 2014). Thus, the mismanagement of sustainability can also occur because the firm simply does not know which sustainability issues are materially important to the firm's stakeholders (Grewal et al. 2016).

This paper examines to what extent these aforementioned inadequacies in managing important business issues regarding sustainability are determined by the firm's overall business strategy. It is assumed that by pursuing the right business strategy that supports the true and correct identification and classification of material sustainability issues, the overall probability of unethical actions, e.g., decoupling or greenwashing, can decline, thus leading to the question: What type of business strategy deters or supports the firm's mismanagement of sustainability issues and drives the firm's unethical business behavior?

To analyze the impact of the firm's overall business strategy on its sustainability management, this paper uses a sample yielding 4596 firm-year observations from US firms for fiscal years 1991–2014. Relying on Miles and Snow's (1978, 2003) categorization of *Prospectors* and *Defenders* and employing multiple firm-level panel regressions, the results show that firms pursuing *Prospector* business strategies are more likely to mismanage sustainability issues for both unintentional and intentional reasons, compared to firms with *Defender* business strategies. In other words, *Prospector* firms have a stronger tendency toward unethical business behavior than *Defender* firms.

This paper thus derives several theoretical and empirical contributions to extant literature. In the theoretical context, the paper builds on institutional theory (e.g., Delmas and Montes-Sancho 2010; Perez-Batres et al. 2012; Laufer 2003; Delmas and Burbano 2011; Berrone et al. 2017; Marquis et al. 2016) and extends this literature stream with the introduction of different substantive management practices. As such, the paper results contribute to the literature that examines the relationship between strategic management and business ethics (e.g., Miles 1993; Velthouse and Kandogan 2007; Elms et al. 2010). Moreover, the results contribute to the literature examining the determinants and consequences of sustainability management (e.g., Eccles et al. 2014; Cheng et al. 2014), sustainability reporting and disclosure regulation (e.g., Grewal et al. 2015; Dhaliwal et al. 2011, 2012; Ioannou and Serafeim 2014) and give implications for the materiality determination within an integrated report (e.g., Eccles and Krzus 2010; Eccles and Serafeim 2014; Serafeim 2014; Maniora 2015; Barth et al. 2016). However, little is known about how the underlying business strategy influences firm's behavior regarding its management practices of sustainability issues. To the best of my knowledge, this is the first paper examining the

empirical link between different types of business strategies and the mismanagement of sustainability issues.

The results show that the overall business strategy of a firm determines its ethical orientation significantly. Exploring the impact of business strategies on the management of sustainability is worthy of scholarly and practical attention for financial and ethical reasons. First, the mismanagement of sustainability issues can jeopardize the firm's financial performance through various channels (e.g., sales, costs, or financing) (Dhaliwal et al. 2012). Thus, firms need to be aware of the different financial opportunities resulting from an efficient sustainability management system that is grounded in the materiality approach. Second, the paper's topic is of rigor interest because it sheds light on how decoupling strategies can be better detected and addressed.

The next section reviews prior literature and develops the main hypotheses followed by a description of the data, variables measurement, and research design. Then, the empirical results and additional robustness tests are presented. Finally, the paper concludes with a critical reflection of the results.

Prior Literature and Hypotheses Development

Institutional theory suggests that firms pursue and obtain legitimacy by conforming to the norms, values, and beliefs prevailing in their organizational environment (DiMaggio and Powell 1983; Meyer and Rowan 1977; Scott 1995). Firms can legitimize their actions when stakeholders consider the firm's actions as both appropriate and useful (Scott 1995; Suchman 1995). To gain legitimacy, firms can choose between two different strategies to respond to external institutional pressures: symbolic and substantive actions (Meyer and Rowan 1977). Symbolic actions refer to the firm's actions that show ceremonial conformity. The firm only appears to comply with external expectations, although its internal business structure and processes remain unchanged. This decoupling of formal organizational structures from actual practices in the firm is more likely if the firm's practice is adopted for legitimacy rather than efficiency reasons (Meyer and Rowan 1977; Westphal and Zajac 1998, 2001). Thus, symbolic actions are only designed to draw stakeholder's attention (Oliver 1991). In contrast, substantive actions constitute real actions that require significant and costly changes in the core business model (Meyer and Rowan 1977).

Drawing on institutional theory, there is a vast amount of literature on the drivers of sustainability performance and sustainability reporting that identifies reasons for sustainability engagement of firms. The reasons range widely from stakeholder pressure over regulatory and institutional requirements, ethical considerations, reputation building, risk management to profit or value maximization (e.g., McWilliams and Siegel 2001; Prakash 2001; Milne and

Patten 2002; Barnett 2007; Bebbington et al. 2008; Unerman 2008; Artiach et al. 2010; Babiak and Trendafilova 2011; Dhaliwal et al. 2011; Ditlev-Simonsen and Midttun 2011; Cho et al. 2012). However, a lack of legitimacy jeopardizes the chances of going concern and firm's survival (Dowling and Pfeffer 1975; Lamin and Zaheer 2012; Attig et al. 2014). In addition, there is literature analyzing the firm's symbolic and substantive response strategies in the sustainability context (e.g., Delmas and Montes-Sancho 2010; Walker and Wan 2012; Perez-Batres et al. 2012; Schons and Steinmeier 2015) and the determinants of greenwashing (e.g., Laufer 2003; Delmas and Burbano 2011; Berrone et al. 2017; Marquis et al. 2016). Marquis et al. (2016) analyzed symbolic compliance in terms of attention deflection. Attention deflection refers to firms that highlight specific desirable actions in order to avoid a further review of their other business activities that do not conform to institutional norms (Marquis et al. 2016). Moreover, greenwashing is a similar strategy whereby firms "mislead consumers about their (actual) environmental performance" (Delmas and Burbano 2011, p. 64). Greenwashing firms reveal positive environmental performance indicators while concealing negative ones, which can lead to a false but positive impression of their overall environmental performance (Delmas and Burbano 2011).

However, the existing literature so far, with the only exception of Khan et al. (2016) and Grewal et al. (2016), does not distinguish between material and immaterial sustainability issues. Materiality matters not only for defining the content of sustainability reports but also for managing and monitoring sustainability issues effectively (2012; KPMG 2014). While the prior literature on symbolic management, greenwashing or decoupling makes "symbolic" actions a subject of discussion, the fact that "substantive" actions differ in terms of materiality and thus in their importance to firms has been neglected. Figure 1 shows the relation between symbolic management and mismanagement of sustainability.

Mismanagement of Sustainability

In this paper, mismanagement of sustainability is defined as the firm's incorrect handling of sustainability issues in terms of the discrimination between material and immaterial sustainability topics. As such, it is reflected in higher performance levels on immaterial sustainability issues than on material ones. Mismanagement of sustainability, as defined before, can exist due to an unregulated materiality assessment process for sustainability, leading to firms' self-assessment. This subjectivity inherent in materiality assessment creates a large space for intentional and unintentional misclassification of material sustainability topics (Calace 2015; 2012; KPMG 2014), such as that firms use different definitions of materiality in their sustainability reports and

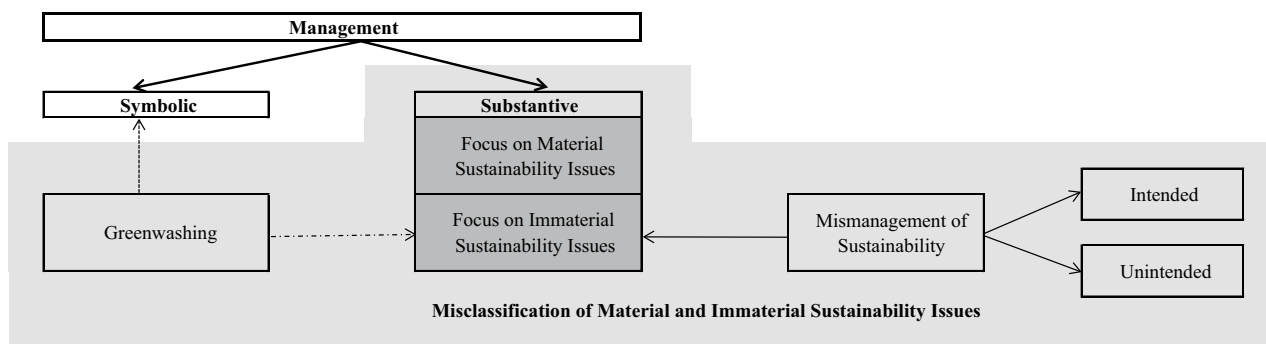


Fig. 1 Relation between symbolic management and the mismanagement of sustainability

SEC filings most suitable to them (SASB 2014; Unerman and Zappettini 2014; Edgley et al. 2014). “Appendix 1” section provides an overview of the different materiality definitions that a firm can use voluntarily for its sustainability classification.

According to Grewal et al. (2016), immaterial sustainability issues are easier to address than material ones because they do not require fundamental changes in the business model, processes, and products of a firm. Immaterial sustainability issues can easily be managed solely by a chief sustainability officer, who is able to address such an issue in a short period of time because it is his responsibility to invest resources without firm-wide coordination and involvement time (Grewal et al. 2016; Miller and Serafeim 2014). In contrast, addressing material sustainability issues usually requires structural changes that affect the business model, processes, and products of a firm (Grewal et al. 2016). Thus, such fundamental changes affect multiple corporate functions and can only be realized via large investments and over long-time horizons (Eccles and Serafeim 2013). In sum, addressing immaterial sustainability issues might be easier and requires spending relatively fewer resources (Grewal et al. 2016). Therefore, it is likely that firms intentionally focus on the management of immaterial sustainability issues than on the more significant ones or even claim sustainability issues to be material although they are immaterial.

There are only two studies so far that consider the role of material sustainability issues by using the SASB definition and materiality map for their empirics. Khan et al. (2016) found that good ratings on material sustainability issues significantly outperform firms with poor ratings on these issues. Moreover, Grewal et al. (2016) showed that filing shareholder proposals is related to subsequent improvements in the performance of the firm on the respective sustainability issue mentioned earlier in the proposal. Further, they find that managers increase performance on immaterial issues in firms with agency problems, low awareness of the materiality of sustainability issues and poor performance on material issues. These findings indicate that a poor materiality

determination process and missing monitoring systems can support the mismanagement of sustainability.

Business Strategy

Miles et al. (1978) formulated a typology for firms with specific business strategies. The four business strategy types are called *Prospectors*, *Defenders*, *Analyzers*, and *Reactors* and have different business strategy characteristics as follows. Because *Prospectors* tend to be very innovative and “first to market” in a broad array of product-market domains, such firm types display rapid and sporadic growth patterns (Miles and Snow 1978, 2003). For this reason, they never achieve maximum efficiency in production and distribution. They rather “invest heavily in R&D activities, giving them greater need for financing but also leaving them with vulnerability to overextending their resources and increasing their risk of incurring losses” (Bentley et al. 2013, p. 785). Ittner et al. (1997) found that *Prospectors* are positively associated with financial distress. In consequence, *Prospectors* tend to have lower profitability and greater need for financing compared to *Defenders*. According to Bentley et al. (2013), these characteristics represent greater business risk. In general, *Defenders* display more cautious and incremental growth patterns through market penetration, leading to minimal R&D activities. *Defenders* focus heavily on cost reduction that therefore reduces the risk of overextending their resources and encountering losses (Miles and Snow 1978, 2003). Because *Defenders* achieve efficiency in their production and distribution systems, they produce less outcome uncertainty (Bentley et al. 2013). *Analyzers* attempt to minimize risk, while maximizing the opportunity for profit (Miles et al. 1978). As such, they combine the strengths of both *Prospector* and *Defenders*. However, the duality in the *Analyzer’s* domain challenges the firm to establish a dual technological core that requires a fundamentally different planning, control, and reward systems from the management at the same time (Miles et al. 1978). *Reactors* lack a set of response mechanisms to deal with a changing environment.

Table 1 Business strategy characteristics

	Prospector	Defender
Definition	Company that continually seeks new and innovative products and operates on the basis of a diversified decision maker model	Company that is typically vertically integrated, has a narrow set of decision makers, specializes in a very narrow product line and focuses heavily on cost reduction
Competitive advantage	Market innovation	Efficiency and stability
Competitive disadvantage	Risk of low profitability and overextension of resources	Adaptability to market shift and threat of obsolescence
Research and development	Extensive R&D in order to exploit new product and market opportunities	Minimal R&D and is usually closely related to current products
Efficiency	Never achieve maximum efficiency in production and distribution systems	Achieve efficiency in production and distribution systems
Growth	Growth occurs in spurts through product-market development	Cautious and incremental growth through market penetration
Marketing	Strong focus on marketing function	Weak focus on marketing function while emphasis is on production and financial functions
Organizational structure and stability	Decentralized control to facilitate and coordinate diverse/numerous operations. Focus on product groups. Dominant coalition is transitory and may hire from outside	Strict centralized control to ensure efficiency and focuses on functional divisions. The dominant coalition is lengthy and tends to promote from within
Capital intensity	Low degree of mechanization and routinization to avoid lengthy commitments to single technological process	High degree of mechanization and routinization focusing on single core cost-efficient technology

This table illustrates the characteristics of the different business strategy types *Prospector* and *Defender* defined by Miles and Snow (1978, 2003) and is taken from Bentley et al. (2013)

According to Miles et al. (1978, p. 557), the *Reactor* is a form of strategic “failure” because “the reactor exhibits a pattern of adjustment to its environment that is both inconsistent and unstable [and] [...] lacks a set of response mechanisms.” As such, *Reactors* are only a “residual” strategy, arising from the inappropriate implementation of the other three business strategies (Miles et al. 1978).

Consequently, Miles and Snow (1978, 2003) referred to three viable business strategies that may exist within industries: *Prospectors*, *Defenders*, and *Analyzers*. The fourth business strategy *Reactor* is not viable in the long term and is often difficult to identify (Miles and Snow 1978, 2003). For this reason, it is common to focus only on the viable strategies (e.g., Hambrick 1983; McDaniel and Kolari 1987; Bentley 2013; Bentley et al. 2013; Higgins et al. 2015). The viable business strategies are positioned along a continuum. *Prospectors* are on the one end and *Defenders* on the other. In the middle of the continuum are *Analyzers* because they have attributes of both *Prospectors* and *Defenders* (Miles and Snow 1978, 2003). For the purpose of this paper, the focus is only on *Prospectors* and *Defenders*, which is consistent with prior research (e.g., Hambrick 1983; Simons 1987; Ittner et al. 1997). Table 1 shows the business strategy characteristics of *Prospectors* and *Defenders* in comparison.

Business Strategy and Mismanagement of Sustainability

Due to *Prospectors*' rapid and sporadic growth patterns, it is hypothesized that sustainability management is not a top priority within the firms' business model. *Prospectors*' risk of low profitability and its associated financing needs make it even more likely that *Prospector*-type firms do not spend enough money on the extension of efficient sustainability management. Ioannou and Serafeim (2010) investigated the determinants of corporate sustainability performance. They find that the risk-return profile, product-market characteristics, firm scale, visibility, ownership structure, and capital needs of a firm are related to sustainability performance. For example, riskier firms seem to be less socially and environmentally responsible, and firms that compete on product differentiation by providing innovative products and services exhibit better sustainability performance. One reason for this finding may be that firms in need of capital for new projects might be short of cash to invest in sustainability-related projects. Moreover, addressing material issues requires large investments and long-time horizons (Grewal et al. 2016; Eccles and Serafeim 2013). For these reasons, it is unlikely that *Prospectors* invest in both time and money for an efficient materiality assessment process, leading to intentional and unintentional mismanagement (overall mismanagement of sustainability). This suggests that *Prospectors* are more

likely to fail in determining the “right” material sustainability issues compared to *Defenders*.

In sum, it is expected that *Prospectors* are more likely than *Defenders* to mismanage material sustainability issues. Thus, the first hypothesis states the following:

Hypothesis 1 Compared to Defender business strategies, Prospector business strategies are *ceteris paribus* more likely to mismanage sustainability.

Due to the fact that firms engage in sustainability on a voluntary basis, sustainability management is often understood as a reputation building device. It is argued that the management of sustainability issues can improve the firm’s reputation, which in turn increases product sales (e.g., Bebbington et al. 2008), attracts more talented employees, or increases staff loyalty and motivation for a higher productivity rate (e.g., Roberts and Dowling 2002; Waddock and Graves 1997). It may also lead to higher visibility of the firm among consumers, employees, suppliers, investors, banks and so on (e.g., Dhaliwal et al. 2011, 2012). In general, *Prospectors* focus more heavily on marketing activities compared to *Defenders*. This also suggests that they care more about their reputation because *Prospectors* depend more on stakeholders’ positive response due to their preference of exploiting new product and market opportunities, leading to a higher need for legitimacy. This strong focus of *Prospectors* on the marketing function implies a tendency for symbolic actions and/or for overstating their substantive sustainability performance, leading to intentional mismanagement of material and immaterial sustainability issues. In other words, *Prospectors* are more likely than *Defenders* to misuse sustainability engagement as a marketing tool that might imply unethical actions (e.g., “greenwashing”).

According to Bentley et al. (2013), *Prospector*-type firms are firms with an overly complex structure and high turnover of senior management or board members that have more opportunities to misreport. *Prospectors*’ coordination mechanisms are complex compared to the simple coordination systems of *Defenders* (Miles and Snow 1978, 2003). This is why *Prospectors* tend to have a decentralized control structure to facilitate and coordinate diverse operations, while *Defenders* have a strictly centralized control mechanism to ensure efficiency. For example, Simons (1987) found that the internal control systems of *Prospectors* change more often than those from *Defenders*. In general, weak internal control systems reduce a fraudster’s risk of being detected and thus create a new window of opportunity to commit “sustainability” fraud (Trompeter et al. 2013). Furthermore, managers of *Prospector*-type firms are more likely to have greater opportunities to engage in financial misreporting (Bentley 2013; Bentley et al. 2013). For example, in case of *Prospector*-type firms, the tenure of senior management

tends to be shorter compared to *Defenders*. In other words, *Prospectors* are more likely to have a so-called transitory dominant coalition, while *Defenders* rely on a more stable senior management team (Miles and Snow 1978, 2003).

In sum, *Prospectors* have more incentives and opportunities than *Defenders* to mismanage sustainability issues with full intention. Thus, the second hypothesis is as follows:

Hypothesis 2 Compared to Defender business strategies, Prospector business strategies are *ceteris paribus* more likely to mismanage sustainability intentionally.

Data and Variables Measurement

Materiality and Sustainability Data

As a source of sustainability data, this paper uses the KLD database. KLD data include a large number of US firms from 1991 onwards and are widely used in other academic papers (e.g., Turban and Greening 1997; Waddock and Graves 1997; Dhaliwal et al. 2011, 2012; Ioannou and Serafeim 2014; Khan et al. 2016; Grewal et al. 2016). The KLD historical ratings data measure the sustainability performance of firms by using a binary system for indicating several strengths and concerns regarding seven issue areas: (a) community, (b) corporate governance, (c) diversity, (d) employee, (e) relations, (f) environmental, and (g) human rights. Strengths indicate that the firm’s policies, procedures, and outcomes have a positive impact on the respective strength measure. Concerns indicate that the firm’s policies, procedures, and outcomes have a negative impact on the respective concern’s measure. It is common to subtract concerns from strengths to obtain a single net score (e.g., Khan et al. 2016; Ioannou and Serafeim 2014).

This paper uses the materiality guidance, the Sustainability Accounting Standards Board (SASB) to define industry-specific material sustainability issues. The SASB is an independent 501(c)3 nonprofit organization with the aim of developing and disseminating sustainability accounting standards that help public firms to disclose material, decision-useful information to investors (SASB 2016a). Recently, in 2016, the SASB finished the development of sustainability accounting standards for approximately 80 industries in 10 sectors. SASB standards are designed for the disclosure of material sustainability information in mandatory filings of the Securities and Exchanges Commission (SEC), such as the Form 10-K and 20-F. SASB’s accounting standards development process is driven by evidence-based research. Balanced stakeholder participation shall ensure a stakeholder-oriented outcome, although SASB adopts an investor perspective for the determination of material and immaterial sustainability issues. In contrast to the

Global Reporting Initiative (GRI) and International Integrated Reporting Council (IIRC), the SASB has launched a materiality map that identifies material sustainability issues on an industry-by-industry basis (SASB 2016b). The SASB Materiality Map™—an interactive tool that identifies and compares probable material sustainability issues across different industries and sectors—was used for the definition of material sustainability issues. To classify each KLD data item as material or immaterial, Khan et al. (2016) downloaded each industry standard from the SASB homepage for 45 industries in their sample. For each industry, KLD data items were classified as material for a given industry if the respective KLD data items were mapped to material SASB items. All the remaining KLD items were classified as immaterial for the respective industry. This paper continues this procedure of Khan et al. (2016) and extends the mapping from 45 to 80 industries. For more information about the mapping of the SASB material topics regarding the KLD data items across sectors, see Khan et al. (2016) and Grewal et al. (2016). This paper develops a new definition and measure for a firm's mismanagement of sustainability issues that are based on the materiality and immateriality index developed by Khan et al. (2016). The materiality index and immateriality index for firm i in year t are constructed by subtracting KLD concerns from KLD strengths to arrive at a single net score. This practice is well established in the literature (e.g., Waddock and Graves 1997; Ioannou and Serafeim 2014; Khan et al. 2016; Grewal et al. 2016).

$$\text{Material}_{it} = \sum \text{KLD STRENGTH}_{it, \text{SASB}} - \sum \text{KLD CONCERN}_{it, \text{SASB}} \quad (1)$$

$$\text{Immaterial}_{it} = \sum \text{KLD STRENGTH}_{it, \text{NONSASB}} - \sum \text{KLD CONCERN}_{it, \text{NONSASB}} \quad (2)$$

The overall mismanagement of sustainability (*OMIS*) arises from the firm's performance on material and immaterial sustainability issues, which is measured by the materiality and immateriality index. Moreover, the intended mismanagement of sustainability issues (*INMIS*) is measured by calculating the difference between good performance on immaterial sustainability issues and bad performance on material sustainability issues. The greater the difference between the firms' good performance on immaterial issues and bad performance on material issues, the more unlikely it is that the firms exhibit such a materiality and immateriality index ratio without any intention. *INMIS* indicates that the firm's performance

on immaterial issues is above-industry average and the performance on material issues is below-industry average.

Business Strategy Data

Financial data are obtained from the COMPUSTAT annual file for fiscal years 1991–2014. Business strategies are defined in line with Bentley et al. (2013). To construct the business strategy composite measure, a 5-year rolling average is used for all the data that is required for the composite measure construction (e.g., Ittner et al. 1997). Relying on Miles and Snow (1978, 2003), *STRATEGY* is a discrete composite measure that proxies for the firm's business strategy. Higher *STRATEGY* scores represent firms with *Prospector* strategies, and lower scores represent firms with *Defender* strategies. In line with Bentley et al. (2013), the *STRATEGY* composite measure consists of the following six measures: (1) the ratio of research and development to sales (RDS) to measure firm's propensity to search for new products, (2) the ratio of employees to sale (EMPS) to measure firm's ability to produce and distribute products and services efficiently, (3) the change in total revenue (REV) to measure firm's historical growth or investment opportunities, (4) the ratio of marketing to sales (SGA) to measure firm's focus on exploiting new products and services, (5) the employee fluctuations ($\sigma(\text{EMP})$) to measure firm's organizational stability, (6) capital intensity (CAP) to measure firm's commitment to technological efficiency.

All variables are computed using a rolling average over the previous 5 years and are ranked by quintiles within each 2-digit SIC industry-year (Bentley et al. 2013; Ittner et al. 1997). Within each firm-year and for each of the six variables, those observations in the highest quintiles are given a score of 5, those in the second highest quintile are given a score of 4, etc., while those in the lowest quintiles are given a score of 1 [except capital intensity that is reverse-scored so that observations in the lowest (highest) quintile are given a score of 5 (1)]. The scores are summed over the six measures per firm-year such that a firm could have received a maximum score of 30 (*Prospector*-type) and a minimum score of 6 (*Defender*-type). "Appendix 2" section provides detailed information about the business strategy composite measure construction by Bentley et al. (2013).

Sample Selection

Although financial data are obtained from the COMPUSTAT annual file for fiscal years 1991–2014, the data available for the business strategy measure restrict the sample due to the rolling prior the 5-year requirement. After deleting 28,401 firm-year observations due to missing financial data for control variables and missing KLD data for measuring

the sustainability performance, the sample yields 4596 firm-year observations for fiscal years 1991–2014.²

Research Design

To analyze the impact of different business strategies on firms' mismanagement of sustainability issues, a series of multiple OLS regressions are estimated with STATA using the following baseline model:

$$\begin{aligned} \text{OMIS/INMIS}_{it} = & \alpha_0 + \alpha_1 \text{STRATEGY}_{it} + \alpha_2 \text{SIZE}_{it} \\ & + \alpha_3 \text{ROA}_{it} + \alpha_4 \text{MTB}_{it} \\ & + \alpha_5 \text{LEVERAGE}_{it} \\ & + \alpha_6 \text{FINANCING}_{it} \\ & + \alpha_7 \text{HERF}_{it} + \alpha_8 \text{BIG4}_{it} + \alpha_9 \text{IO}_{it} \\ & + \text{Fixed effects} + \varepsilon_{it} \end{aligned} \quad (3)$$

The overall mismanagement of sustainability (*OMIS*) is measured by the materiality and immateriality index developed by Khan et al. (2016). *OMIS* gives an overview about the overall occurrence and the level of the firm's sustainability performance on material and immaterial sustainability issues. Thus, no distinction is made between intentional and unintentional mismanagement. To classify material and immaterial sustainability issues across industries, each KLD data item is mapped to the material SASB topics for every single sector and industry. Those not defined as material by the SASB are classified as immaterial. The materiality and immateriality index for firm *i* in year *t* are constructed by subtracting the KLD concerns from the KLD strengths to arrive at a single net score.

The intended mismanagement of sustainability issues (*INMIS*) measures the intentional mismanagement and is calculated by the difference between good performance on immaterial and bad performance on material sustainability issues. Specifically, *INMIS*_{it} is measured by an indicator variable that equals to 1 if the firm's performance on immaterial issues is above-industry average and the performance on material issues is below the industry's average, and 0 otherwise, assuming that such a big difference cannot arise and remain over time without the firm's notice. Thus, the underlying assumption is that such an existing level of sustainability mismanagement is not likely to exist without

firm's intention and as such is intentionally induced and left by the firm.

The main variable of interest is *STRATEGY* that measures a firm's business strategy. Following Bentley et al. (2013), the composite measure construction of *STRATEGY* is based on Miles and Snow's business strategy typology (1978, 2003) that focuses on the interaction organization–environment and the rate of change in products or markets. Higher *STRATEGY* scores represent firms with *Prospector* strategies, while lower scores represent firms with *Defender* strategies. The expectation is to find a positive association between *STRATEGY* and *OMIS*. In other words, it is expected to find for the coefficient on *STRATEGY* a negative sign when *OMIS* is measured by the materiality index (MI) and a positive sign when *OMIS* is measured by the immateriality index (IMI). To make sure that the predictions regarding MI and IMI along the OLS regressions remain transparent and understandable, each regression table uses a predicted signs approach.

Moreover, the following control variables are included: firm size (*SIZE*), profitability (*ROA*), growth opportunities (*MTB*), leverage (*LEVERAGE*), financing need (*FINANCING*), industry competition (*HERF*), auditor (*BIG4*), and institutional ownership (*IO*). Prior research indicates that larger firms exhibit higher sustainability performance scores (e.g., Ioannou and Serafeim 2010). However, in the context of material sustainability, management could have more incentives to mismanage material sustainability because of greater stakeholder pressure. Thus, no prediction is made for *SIZE*. Based on prior research on sustainability performance (e.g., Eccles et al. 2014; Ioannou and Serafeim 2010), it is expected to find a positive (negative) coefficient on *ROA* for MI (IMI) because more profitable firms are more likely to afford sustainability engagement in material issues. The association between *MTB* and MI (IMI) is expected to be negative (positive) because firms with significant growth opportunities are likely to compete through innovative and differentiated products and services (e.g., Ioannou and Serafeim 2010; McWilliams and Siegel 2001) and therefore have to meet the new requirements of green consumers and investors. Cheng et al. (2014) showed that firms with high sustainability performance levels face significantly lower capital constraints than firms with low sustainability performance. As a result, the cost of financing for firms that perform low on sustainability is high. Thus, the coefficient on *FINANCING* should be negative (positive) for MI (IMI) because firms that have greater financing needs to stay competitive are less likely to invest in material sustainability issues. No prediction is made for *LEVERAGE*. Industry competition is controlled by using the Herfindahl Index (*HERF*) following Ioannou and Serafeim (2010). On the one hand, greater industry competition could be an incentive for the mismanagement of sustainability because

² Two-tailed *t* tests reveal that firms in the final sample and firms in the deleted sample only significantly differ in terms of size effects (*t* value 23.45). Final firms are, on average, larger. This finding is due to the fact that it is easier to collect data from large firms. Data for small- and medium-sized firms are often not available to the public. However, *STRATEGY* is not statistically significant between the two sample groups, meaning that there is no difference in pursuing business strategies between final and deleted firms.

Table 2 Sample Distribution and Descriptive Statistics

SICS industry	Full sample		Prospectors		Defenders						
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)					
<i>Panel A: Sample distribution—SICS affiliation (firm-years)</i>											
1. Financials	15	0.33	0	0.00	1	0.21					
2. Health care	500	10.88	49	20.59	10	2.11					
3. Technology and communication	541	11.77	36	15.13	19	4.00					
4. Non-renewable resources	78	1.70	18	7.56	10	2.11					
5. Transportation	197	4.29	15	6.30	13	2.74					
6. Services	414	9.01	17	7.14	26	5.47					
7. Resource transformation	1638	35.64	64	26.89	200	42.11					
8. Consumption	1039	22.61	14	5.88	165	34.74					
9. Renewable resources and alternative energy	158	3.44	25	10.50	29	6.11					
10. Infrastructure	16	0.35	0	0.00	2	0.42					
Total	4596	100.00	238	100.00	475	100.00					
Variable	Full sample							Prospectors		Defenders	
	Mean	Min	25%	Med	75%	Max	SD	Mean	Med	Mean	Med
<i>Panel B: Descriptive statistics</i>											
<i>MATERIALITY INDEX</i>	0.19	- 2.00	0.00	0.00	1.00	3.00	1.03	0.06	0.00	0.05	0.00
<i>IMMATERIAL INDEX</i>	0.11	- 5.00	- 2.00	0.00	1.00	6.00	2.52	0.39	0.00	- 0.55	0.00
<i>STRATEGY</i>	17.39	9.00	15.00	17.00	20.00	26.00	3.72	24.81	25.00	11.02	11.00
<i>SIZE</i>	8.00	3.69	6.81	7.96	9.09	12.05	1.60	8.61	8.60	7.81	7.62
<i>ROA</i>	0.05	- 0.73	0.03	0.06	0.10	0.28	0.10	0.04	0.06	0.04	0.05
<i>MTB</i>	1419.88	- 1225.81	91.75	280.32	1058.50	13,204.90	2955.61	3100.22	696.04	1075.23	144.56
<i>LEVERAGE</i>	0.52	0.07	0.36	0.52	0.65	1.24	0.22	0.47	0.47	0.60	0.60
<i>FINANCING</i>	0.01	0.00	0.00	0.00	0.00	1.00	0.08	0.02	0.00	0.03	0.00
<i>HERF</i>	0.30	0.02	0.12	0.23	0.39	1.00	0.23	0.24	0.20	0.37	0.32
<i>BIG4</i>	0.94	0.00	1.00	1.00	1.00	1.00	0.24	0.97	1.00	0.93	1.00
<i>IO</i>	0.10	0.00	0.00	0.04	0.18	0.71	0.13	0.07	0.01	0.14	0.10

This table shows sample distribution and the descriptive statistics. The sample distribution is based on the *STRATEGY* is a discrete score ranging from 6 to 30 where high [low] values indicate Prospector [Defender] firms. *SIZE* is the natural logarithm of total assets. *ROA* is the return on assets, and *MTB* is the market-to-book ratio. *LEVERAGE* is total debt divided by total assets, and *FINANCING* is an indicator variable that equals one if the firm's free cash flow is less than - 0.5, and 0 otherwise. *HERF* is the Herfindahl index that equals the sum of squares of market shares of all firms in an industry (3-digit SIC). *BIG4* is an indicator variable that equals one if the firm is audited by a Big Four audit company, and 0 otherwise. *IO* is the percentage of institutional ownership

Bold values indicate significant differences ($p < 0.05$)

firms that have to stay competitive could be more engaged in pretending to have good sustainability performance. On the other hand, it could prevent mismanagement because firms have to show real sustainability performance to stay competitive. Thus, no prediction is made for *HERF*. Since the presence of big audit firms can have a monitoring function regarding the firm's management of sustainability issues (e.g., Edgley et al. 2014), it is predicted that *BIG4* is positively (negatively) related to MI (IMI). Moreover, Ioannou and Serafeim (2010) found that more closely held firms perform badly on sustainability issues. Thus, the prediction is that closely held firms are expected to be more engaged

in sustainability mismanagement because a more dispersed ownership structure puts firms under public pressure more significantly. Thus, the coefficient on *IO* is expected to be negatively (positively) associated with MI (IMI).

Empirical Results

Sample Distribution and Descriptive Statistics

Table 2 presents the descriptive statistics for the full sample and separate subsamples for *Prospectors* and *Defenders*. In Table 2, Panel A provides the sample distribution

per industry affiliation, where firm-year observations are classified by the Sustainable Industry Classification System™ (SICS) of the SASB.³ The full sample comprises 4596 firm-year observations, whereas 238 firm-year observations represent *Prospectors* and 475 firm-year observations represent *Defenders*. Approximately 58 percent of the full sample are related to the SICS sectors “Resource Transformation” and “Consumption.” Consistent with expectations, *Prospectors* are more present in innovative industries, such as the health care and technology and communication sector, while *Defenders* are mainly represented in stable and low-changing industry environments, such as the resource transformation sector. Moreover, in Table 2, Panel B provides summary statistics for all variables used in the main regression analyses. *Prospectors* and *Defenders* have significantly different mean and median values ($p < 0.05$), except for *SIZE* and *BIG4*. Consistent with the definition of *STRATEGY*, *Prospectors* have a higher mean and median for the strategy variable than *Defenders*. Compared to *Defenders*, *Prospectors* are, on average, more growth oriented (*MTB*), have lower leverage (*LEVERAGE*), are less involved in concentrated markets (*HERF*), and have less institutional ownership (*IO*).

Regression Results

Table 3 presents the empirical results of the model estimation tests for Hypothesis 1. Consistent with Hypothesis 1, *STRATEGY* is highly significant and negatively associated with the MI, suggesting that the more a firm’s business strategy aligns with a *Prospector*-type business strategy, the lower is its sustainability performance level on material issues. The negative coefficient on *PROSPECTOR* is highly significant, again supporting hypothesis 1. There is no significant finding for *DEFENDER*. Hence, the IMI is negatively and highly significantly associated with *DEFENDER*. This suggests that *Defenders* perform well on immaterial sustainability issues. In short, the results suggest that *Defenders* are not likely to perform extremely well on material issues, but *Prospector* business strategies are more likely to have a negative impact on the overall management of material

sustainability issues. The control variables are generally consistent with expectations, whereas only *MTB* (*FINANCING*) has a significant impact on MI (IMI).

Table 4 provides the regression results for Hypothesis 2. The main variable of interest *PROSPECTOR* is highly significant and positively related to all model specifications, while *DEFENDER* is not significant. These findings suggest that *Prospectors* are more likely to engage in the intentional mismanagement of sustainability than *Defenders*.

Robustness Tests

Addressing Endogenous Self-Selection

Managers choose business strategies with particular expectations. For example, they choose the business strategy that yields high financial performance or the business strategy that will achieve other goals. In other words, the choice of a firm’s business strategy is endogenous and the correction for endogeneity is crucial (Hamilton and Nickerson 2003). The Heckman two-stage estimation procedure is used (Heckman 1976) to test whether the results of this paper are robust to self-selection biases. According to Tucker (2011), the method of adding the inverse Mills ratio from the first-stage regression to the second-stage regression model best addresses the selection bias coming from unobservable factors. Following the recommended econometric practice of imposing one or more exclusion restrictions in the second stage (Lennox et al. 2012), the variable *LITIGIOUS* (indicating if a firm operates in an industry with high litigation risk) is added to the first-stage regression of the baseline model that represents a probit regression with *PROSPECTOR* as the dependent variable.

Untabulated first-stage regression results show that every independent variable is significant except for *FINANCING*, *HERF*, and *LITIGIOUS*. *SIZE*, *MTB* and *BIG4* are significantly and positively related to *PROSPECTOR*, while *ROA*, *LEVERAGE*, and *IO* are significantly and negatively associated with *PROSPECTOR*. Untabulated second-stage regression results reveal that *PROSPECTOR* is highly significant and negatively related to the materiality index (-0.331 , t value -3.04), while *DEFENDER* is not statistically significant. The relation between *PROSPECTOR* and the immateriality index is not significant, but *DEFENDER* is statistically significant and positively related (0.369 , t value 1.94). These results confirm the main results from the baseline model for Hypothesis 1. Testing the robustness of Hypothesis 2, the second-stage regression results show that *PROSPECTOR* is positively and significantly associated with intended mismanagement of sustainability (0.173 , t value 3.25), while *DEFENDER* is not significant.

³ However, SASB’s industry sector classification is different from other existing industry classification systems in two ways. First, SASB “rearranged the industries based on the similarity of companies’ sustainability challenges and innovation opportunities [...]. Second, [...] [SASB] surface industries with great innovation potential in terms of addressing sustainability challenges, without regard to the market cap of currently listed companies” (SASB 2013, p. 1). As a result, SASB established the Sustainable Industry Classification System™ (SICS). To make the materiality data compatible with the sustainability data from KLD and financial data from COMPUSTAT, SICS industries were mapped in this study to the industries in the Standard Industrial Classification (SIC) codes.

Table 3 Overall mismanagement of sustainability issues (OMIS) and business strategy

	Pred. sign	MATERIALITY INDEX (MI)		Pred. sign	IMMATERIALITY INDEX (IMI)	
		(I)	(II)		(III)	(IV)
<i>STRATEGY</i>	-	- 0.026** (- 2.00)	-	+	- 0.010 (- 0.41)	-
<i>PROSPECTOR</i>	-	-	- 0.309 *** (- 2.73)	?	-	- 0.115 (- 0.50)
<i>DEFENDER</i>	+	-	0.048 (0.58)	?	-	0.348 ** (2.02)
<i>SIZE</i>	?	0.007 (0.07)	0.003 (0.03)	?	- 0.017 (- 0.11)	- 0.024 (- 0.15)
<i>ROA</i>	+	- 0.042 (- 0.22)	- 0.050 (- 0.25)	-	0.135 (0.35)	0.153 (0.40)
<i>MTB</i>	-	- 0.000 *** (- 3.15)	- 0.000 *** (- 3.23)	+	- 0.000 (- 0.44)	- 0.000 (0.50)
<i>LEVERAGE</i>	?	- 0.006 (- 0.03)	- 0.005 (- 0.02)	?	- 0.076 (- 0.18)	- 0.072 (- 0.17)
<i>FINANCING</i>	-	0.118 (0.61)	0.120 (0.64)	+	0.657 * (1.90)	0.637 * (1.84)
<i>HERF</i>	?	0.033 (0.13)	0.046 (0.18)	?	- 0.635 (- 1.33)	- 0.661 (- 1.40)
<i>BIG4</i>	+	- 0.052 (- 0.29)	- 0.043 (- 0.23)	-	- 0.105 (- 0.25)	- 0.121 (- 0.29)
<i>IO</i>	-	0.375 (0.94)	0.373 (0.93)	+	1.279 (1.32)	1.185 (1.23)
Intercept		1.136 (1.21)	0.734 (0.81)		- 0.500 (- 0.33)	- 0.640 (- 0.44)
Fixed effects (year and industry)		Included	Included		Included	Included
No. of observations		4596	4596		4596	4596
Adj. R ²		0.110	0.111		0.130	0.131

Testing Hypothesis 1, this table presents the main regression results to examine the impact of different business strategies on the mismanagement of sustainability issues. All variables are defined in the explanations of Table 2. All continuous variables are winsorized at the 1st and the 99th percentiles. Fixed effects on industry and year level are included

Bold values indicate significant differences ($p < 0.05$)

***, **, * indicate significance at 1, 5, and 10% levels for two-tailed tests of differences. *t* statistics are shown in parentheses. Robust standard errors are clustered by firm

Exclusion of Utilities and Financial Industries

As a further robustness test, financial firms and utilities are excluded. The exclusion of financial firms and utilities is a common practice in quantitative management and accounting studies because the business model of firms from these sectors is fundamentally different (e.g., Fama and French 1992; Bentley et al. 2013). For example, Fama and French (1992, p. 429) stated that the exclusion of financial firms is necessary “because the high leverage that is normal for these firms probably does not have the same meaning as for non-financial firms, where high leverage more likely indicates distress.” Moreover, Bentley et al. (2013, p. 793) argued that utilities and financial industries (SIC 4900–99

and 6000–999) need to be deleted “due to the regulated nature of these industries.”

Thus, excluding firms from the financial sector ensures that the results are not driven by financial firms. The rationale behind the decision not to delete utilities and financial industries (SIC 4900–99 and 6000–999) in the main analyses of this paper is that the difference in those industries’ nature with respect to SICs does not influence the comparison of firms within one industry regarding sustainability risks and opportunities. This practice is in line with Grewal et al. (2016) and Khan et al. (2016). The deletion of utilities and financial industries does not change the results.

Table 4 Intended mismanagement of sustainability issues (INMIS) and business strategy

	Pred. sign	INTENDED MISMANAGEMENT OF SUSTAINABILITY (INMIS)		
		(I)	(II)	(III)
<i>PROSPECTOR</i>	+	0.170 ** (3.13)	0.170 *** (3.12)	–
<i>DEFENDER</i>	–	–	0.020 (0.67)	0.022 (0.72)
<i>SIZE</i>	?	0.004 (0.13)	0.004 (0.12)	0.008 (0.25)
<i>ROA</i>	+	– 0.044 (– 0.53)	– 0.043 (– 0.51)	– 0.048 (– 0.57)
<i>MTB</i>	–	0.000 (1.38)	0.000 (1.37)	0.000 (1.45)
<i>LEVERAGE</i>	?	0.004 (0.05)	0.004 (0.06)	– 0.004 (– 0.05)
<i>FINANCING</i>	–	0.082 (1.49)	0.081 (1.45)	0.086 (1.51)
<i>HERF</i>	?	– 0.018 (– 0.17)	– 0.020 (– 0.19)	– 0.028 (– 0.26)
<i>BIG4</i>	+	– 0.105 (– 1.18)	– 0.107 (– 1.20)	– 0.102 (– 1.12)
<i>IO</i>	–	0.014 (0.09)	0.008 (0.05)	– 0.011 (– 0.07)
Intercept		0.304 (0.99)	0.305 (1.00)	0.287 (0.91)
Fixed effects (year and industry)		Included	Included	Included
No. of observations		4596	4596	4596
Adj. R^2		0.019	0.019	0.014

Testing Hypothesis 2, this table presents the regression results to investigate the impact of *Prospector* and *Defender* business strategies on the intended mismanagement of sustainability issues. All variables are defined in the explanations of Table 2. Fixed effects on industry and year level are included

Bold values indicate significant differences ($p < 0.05$)

***, **, * indicate significance at 1, 5, and 10% levels for two-tailed tests of differences. t statistics are shown in parentheses. Robust standard errors are clustered by firm

Deleting Firm-Year Observations Less Than 100

To further test the robustness of the main findings, firm-year observations that are less than 100 are deleted from the full sample. After dropping 109 firm-year observations and rerunning the main regressions, untabulated results show that the results still remain the same for all dependent variables and the main variables of interest *PROSPECTOR* and *DEFENDER*. This indicates that the results are not driven by outliers.

Discussion and Conclusion

This paper calls general attention to the sustainability materiality determination process and on the subsequent new opportunity for firms to deceive stakeholders intentionally due to the lack of regulation, since the results of the paper suggest that *Prospectors* are more likely to intentionally mismanage sustainability issues than *Defenders*. The topic of sustainability mismanagement is important for stakeholders, who demand transparency from firms, as well as for sustainability practitioners and scholars. With regard to sustainability reporting, regulators and standard setters should provide legal frameworks to restrict intentional and unintentional misclassification of material sustainability topics. In this context, auditors that provide external assurance of sustainability reports should carefully review the materiality determination process. Since published sustainability information is not subject to mandatory audits, the assurance services that are voluntarily chosen by the firm can vary with regard to depth, scope, and frequency (e.g., Junior et al. 2014).

However, the classification scheme for material and immaterial sustainability issues opens up a new playing field for business ethics scholars, such as an examination of other underlying determinants of a misclassification, internal and external consequences, or the role of misclassification in assurance services of sustainability reports. Nonetheless, it is worth mentioning that this study is not free of limitations. Thus, future research could improve the generalizability and validity of these findings. First, this paper uses newly available materiality guidance from the SASB for US firms to define industry-specific material sustainability issues. As such, those materiality guidelines are specifically constructed for US firms. For other countries, the materiality guidance used in this paper may need to be adjusted to meet country-specific conditions. Second, the materiality and immateriality index used in this study is constructed by subtracting KLD concerns from KLD strengths to arrive at a single net score. Although this practice is well established in the literature (e.g., Waddock and Graves 1997; Ioannou and Serafeim 2014; Khan et al. 2016; Grewal et al. 2016), some researchers prefer to treat strengths and concerns as separate measures (e.g., Strike et al. 2006; Schreck 2009; Dixon-Fowler et al. 2017). The main argument against using the single net score is that such a construction neglects the weighting of the single issue areas, leading to an equal treatment of all KLD dimensions (e.g., Waddock and Graves 1997; Ruf et al. 1998; Schreck 2009; Dixon-Fowler et al. 2017). For this reason, researchers even demand an industry-specific weighting scheme (e.g., Schreck 2009). However, this paper modifies the traditional subtraction method by

subtracting material (immaterial) SASB concerns from material (immaterial) SASB strengths presented by the single KLD issue areas. This means that an appropriate weighting takes place for every single issue area and its related items. Moreover, the SASB approach represents an industry-specific weighting. Overall, concerns about the development of a single net score using KLD can be removed in the context of this paper.

Third, this paper develops a new definition and empirical measure for a firm's intentional mismanagement of sustainability (*INMIS*). The construct validity is based on the assumption that firms—compared to their industry peers—do not perform below-average on material and above-average on immaterial issues without noticing the discrepancy. Furthermore, *INMIS* is based on the industry-average to have a comparable benchmark group that is affected by the same business environment. As such, the industry-average should assert some flexibility. However, there may be some exceptions for the underlying assumption to hold for various reasons (e.g., opaque firm structures). For example, to be a firm that actually pretends to be good, stakeholders need to be informed through diverse communication channels (e.g., sustainability reports, website, social media platforms).

Fourth, literature suggests that firms can pursue proactive strategies for their overall business and corporate social responsibility (CSR) management. Proactive CSR represents business practices adopted voluntarily by firms that go beyond regulatory requirements (Torugsa et al. 2013). Hence, the level of proactivity can vary with the economic, social, and environmental dimension of CSR (Torugsa et al. 2013). This paper analyzes sustainability mismanagement on an aggregate level that comprises all three CSR dimensions. Further research could separately analyze every single dimension. For example, prior research suggests that the environmental dimension of proactive CSR focuses on innovation, eco-efficiency, pollution prevention, and environmental leadership (e.g., Aragón-Correa 1998; Buysse and Verbeke 2003). For example, Aragón-Correa (1998) assumes that *Prospectors* are the most proactive firms in their postures and finds that proactive characteristics encourage firms to adopt advanced approaches to the natural environment. Thus, this finding by Aragón-Correa (1998) can be attributed to factors such as study's design and publication time. For example, the study by Aragón-Correa (1998, p. 558) is based on questionnaires sent to the CEOs of Spanish firms "because of their great knowledge of their firms' strategic situations." However, *Prospectors* tend to have a decentralized control structure to facilitate and coordinate diverse operations, leading to an opaque firm

structure. This suggests that the CEO may not necessarily be informed about the firm's environmental management practices. Particularly, in the last decade, whole new departments and jobs for managing sustainability issues have been created (e.g., sustainability departments, chief sustainability officers) (e.g., McNulty and Davis 2010; Strand 2013; Miller and Serafeim 2014). This new development needs to be taken into account. However, the question is whether and to what extent an efficient implementation of advanced environmental management systems actually takes place because the adoption can represent a symbolic action per se (e.g., Howard et al. 1999; Delmas and Montes-Sancho 2010). For example, Darnall and Sides (2008) and Welch et al. (2000) found that firms adopting the Climate Challenge Program, a voluntary environmental management system developed by the US Environmental Protection Agency, do not reduce their emissions. In fact, the emissions of non-participants were 7.7% lower (Darnall and Sides 2008). In this sense, firms' discrimination process of material and immaterial sustainability issues could be a fruitful area for further research.

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Compliance with Ethical Standards

Conflicts of interest The author declares that she has no conflict of interest.

Research Involving Human Participants and/or Animals This article does not contain any studies with human participants or animals performed by any of the authors.

Informed Consent No humans are involved.

Appendix 1

See Table 5.

Table 5 Materiality definitions

Institution	Global reporting initiative (GRI)	International integrated reporting council (IIRC)	Sustainability accounting standards board (SASB)
Materiality definition	The report should cover aspects that reflect the organization's significant economic, environmental and social impacts; or substantively influence the assessments and decisions of stakeholders. (GRI 2013, p. 11)	An integrated report should disclose information about "matters that substantively affect the organization's ability to create value over the short, medium and long term." (IIRC 2013, p. 18)	SASB follows the definition of materiality adopted by US Securities laws and case law. According to the US Supreme Court, information is material if there is "a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the 'total mix' of the information made available." (US Supreme Court 1976, p. 1)
Additional Information	Organizations are faced with a wide range of topics on which they could report. Relevant topics are those that may reasonably be considered important for reflecting the organization's economic, environmental and social impacts, or influencing the decisions of stakeholders, and, therefore, potentially merit inclusion in the report. Materiality is the threshold at which Aspects become sufficiently important that they should be reported. Beyond this threshold, not all material aspects are of equal importance and the emphasis within a report should reflect the relative priority of these material aspects. (GRI 2013, p. 11)	Not all relevant matters will be considered material. To be included in an integrated report, a matter also needs to be sufficiently important in terms of its known or potential effect on value creation. This involves evaluating the magnitude of the matter's effect and, if it is uncertain whether the matter will occur, its likelihood of occurrence. (IIRC 2013, p. 19)	≠ The SASB provides sustainability accounting standards for use by publicly listed corporations in the USA in disclosing material sustainability issues for the benefit of investors and the public. Material issues are matters that individually or in the aggregate are important to the fair representation of an entity's financial condition and operational performance (SASB 2015). SASB's Materiality Map identifies likely material sustainability issues on an industry-by-industry basis (SASB 2016b).
Self-assessment: materiality determination process			Materiality map: SASB identified material sustainability issues on an industry-by-industry classification

Appendix 2

See Table 6.

Table 6 Composite measure construction for *STRATEGY*. Source: Bentley et al. (2013)

Business strategy: composite measure construction (Bentley et al. 2013)

This paper defines business strategy in line with Bentley et al. (2013) who describe the composite measure construction of the *STRATEGY* measure as follows: The *STRATEGY* measure is constructed of the following six measures based on Ittner et al. (1997) and Miles and Snow (1978, 2003). Each of the variables is measured per firm-year based on the rolling prior 5-year average. Then each of these average variables is ranked into quintiles per industry (2-digit SIC code) and year. Those observations in the highest quintiles are given a score of 5, those in the second highest quintile are given a score of 4, etc., while those in the lowest quintiles are given a score of 1 (except capital intensity which is reversed-scored so that observations in the lowest (highest) quintile are given a score of 5 (1)). The scores are summed over the six measures per firm-year such that a firm could have receive a maximum score of 30 (Prospector-type) and a minimum score of 6 (Defender-type). The discrete *STRATEGY* score ranges along a continuum in value from 6 to 30 with Defender- and Prospector-type firms closer to the end-points and Analyzer-type firms constituting the middle of the *STRATEGY* continuum, consistent with organizational theory (Miles and Snow 1978, 2003). Although the discrete *STRATEGY* measure is the primary measure, the following strict definition for the single *STRATEGY* types is considered: Defenders (6–12), Analyzers (13–23), Prospectors (24–30)

Variable Measure	Variable Measurement [COMPUSTAT code]
(1) Ratio of research and development to sales (RDS5) <i>Firm's propensity to search for new products.</i>	Ratio of research and development expenditures [XRD] to sales [SALE] computed over a rolling prior 5 years average.
(2) Ratio of employees to sale (EMPS5) <i>Firm's ability to produce and distribute products and services efficiently.</i>	Ratio of the number of employees [EMP] to sales [SALE] computed over a rolling prior 5 years average.
(3) Change in total revenue (REV5) <i>Firm's historical growth or investment opportunities.</i>	One-year percentage change in total assets [SALE] computed over a rolling prior 5 years average.
(4) Marketing to sales (SGA5) <i>Firm's focus on exploiting new products and services.</i>	Ratio of selling, general and administrative expenses [XGSA] to sales [SALE] computed over a prior 5 years average.
(5) Employee fluctuations (o(EMP5)) <i>Firm's organizational stability.</i>	Standard deviation of the total number of employees [EMP] computed over a rolling prior 5-year period.
(6) Capital intensity (CAP5) <i>Firm's commitment to technological efficiency.</i>	Capital intensity which is measured as net PPE [PPENT] scaled by total assets [AT] computed over a rolling prior 5 years average.

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