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Financial materiality and corporate risk: Evidence from an Instrumental Variables (IV) design

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ABSTRACT

This article investigates how the disclosure of financially material information relates to corporate risk. Studying a sample of 18,207 firm-year observations from 27 countries and using the SASB materiality framework, I find evidence that firms with higher disclosure scores of financially material items show lower standard deviation of stock returns and lower idiosyncratic risk. Moreover, I explore an instrumental variables (IV) design and find that the disclosure of financially material items reduces total risk but not idiosyncratic risk. This research contributes to the current debate on whether the disclosure of material items affects corporate prospects.

1. Introduction

The materiality framework developed by the Sustainability Accounting Standards Board (SASB)[1] is a fundamental tool for firms to identify sustainability issues that can significantly affect their long-term performance and is widely recognized for its ability to link these material issues to financial risks (Busco et al., 2020). The key benefits of this framework are (a) to provide investors with a list of sustainability issues that they need to pay attention to when evaluating the prospects of a company and (2) to allow companies to recognize what are the most important issues to their future performance and how to disclose them.

The outcomes of increased disclosure can either decrease or increase corporate risk. First, by focusing on financially material sustainability issues, companies can better understand and manage risks and opportunities associated with these issues, and thus create strategies to mitigate them in the long term and to drive value creation. For example, if a company operates in an industry that is susceptible to water scarcity, then water management practices would be a material issue. By recognizing this risk, firms can create strategies to deal with water-related risks, mitigating corporate risk. Investors benefit from the improved transparency created by the disclosure of issues containing material information since they can create portfolio diversification strategies that mitigate these risks, while also increasing the informativeness of a firm's stock price (Schiehll and Kolahgar, 2021). However, it is also possible that disclosing material issues can increase a firm's risk whenever these risks are not effectively managed. For example, failing to address water-related risks could lead to problems such as water shortages or regulatory fines. This can lead not only to litigation and sanctions but also damages to reputation and financial costs. Moreover, if investors demand a compensation for increased risk arising from material issues, then a positive association between materiality and risk would appear (Matsumura et al., 2022). Based on these conflicting arguments, whether the disclosure of material sustainability issues has a positive or a negative association with corporate risk is an empirical question, which this study aims to answer.

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[1] < https://www.sasb.org/ >

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2. Empirical design

2.1. Dependent variable: firm-level risk

I use several proxies for corporate risk that are consistent with previous literature (Panousi and Papanikolaou, 2012; Glover and Levine, 2015; Caixe et al., 2019; Wang and Yang, 2023). First, I calculate a stock return's total risk ($\sigma_{i,t}^{total}$) as the standard deviation of the weekly returns that each stock generated each year. I used weekly returns instead of daily returns because many stocks are not traded daily in many emerging markets.

Second, to measure idiosyncratic risk ($\sigma_{i,t}^{idi}$), I regress the company's stock excess return on the Fama and French three-factor risk premiums:

$$\left(R_{i,w} - R_{f,w}\right) = \beta_0 + \beta_1 \times \left(R_{M,w} - R_{f,w}\right) + \beta_2 \times R_{SMB,w} + \beta_3 \times R_{HML,w} + \epsilon_{i,w} \quad (1)$$

where, $R_{i,w}$ is the stock return of firm i in week w, $R_{M,w}$ is the value-weighted market portfolio return; $R_{f,w}$ is the risk-free rate, $R_{SMB,w}$ is the difference between the returns on value-weighted portfolios of small and big stocks, and $R_{HML,w}$is the difference between the returns on value-weighted portfolios of high and low book-to-market equity stocks, and $\varepsilon_{i,w}$ is the error term. The idiosyncratic risk ($\sigma_{i,t}^{idi}$) of firm i in year t is measured as the standard deviation of the natural logarithm of the residual of Eq. (1) using all weeks of a year.[2]

Finally, $\sigma_{i,t}^{idi}$ corresponds to the portion of the total risk that is unique to a firm i and corresponds to the levered equity volatility if the firm has existing debt (Glover and Levine, 2015). Thus, the unlevered idiosyncratic risk ($\sigma_{i,t}^{idi_{unlev}}$) can be computed as:

$$\sigma_{i,t}^{idi_{unlev}} = \frac{E}{D+E}\sigma_{i,t}^{idi}$$

2.2. Independent variable: firm-level materiality factors

The main independent variable is Trucost's insight score, provided by Factset. Trucost rates all 26 General Issue Categories (GICs) of the 5 groups[3] defined by SASB. The Trucost's insight score are "measure of the longer-term ESG track record of a company, similar to a rating system […] and the half-life of an event's influence on the overall score is 6 months". Thus, one can argue that the disclosure scores reflect, on average, six months prior to the assessment. Therefore, the first variable of interest is *Allcategories*, which combines a firm's scores for all GICs.

Out of the 26 GICs, SASB identifies those that are financially material for each industry, recognizing the heterogeneity in the issues affecting industries. Financial materiality refers to sustainability information that is relevant to the creation of a firm's long-term value (Khan et al., 2016). These material issues are expected to have a significant impact on the firm's valuation and strategies, and their omission or misstatement can significantly influence market valuation. Therefore, the second variable of interest is *Materiality*, which aggregates only the scores of financially material GICs, as identified by SASB.

2.3. Empirical model

The empirical model is represented by Eq. (2).

$$Risk_{i,t} = \alpha + \beta_1 \times Disclosure_{i,t} + \beta_2 \times \frac{Total\ Debt}{TA}_{i,t-1} + \beta_3 \times \frac{Net\ PPE}{TA}_{i,t-1} + \beta_4 \times Mtb_{i,t-1} + \beta_5 \times Payout_{i,t-1} + \beta_6 Ln(TA)_{i,t-1} + \beta_7 ROA_{i,t-1} + \beta_8 \times \frac{Cash}{TA}_{i,t-1} + \beta_9 \times \frac{R\&D}{TA}_{i,t-1} + Year\ FE + Firm\ FE + Industry \times Year\ FE\epsilon_{i,t} \quad (2)$$

where risk is one of the following proxies of risk: total risk ($\sigma_{i,t}^{total}$), idiosyncratic risk ($\sigma_{i,t}^{idi}$), or unlevered idiosyncratic risk ($\sigma_{i,t}^{idi_{unlev}}$). The main independent variables, labeled in Eq. (2) as Disclosure, are either *Allcategories* or *Materiality*, but as robustness, I also include scores of each of the five SASB groups (see footnote 3). The control variables are based on previous literature (Abdoh and Varela, 2017) and winsorized at 1% in both tails. All control variables are lagged to mitigate concerns of simultaneity.

[2] Alternatively, I estimate the CAPM model using only ($R_{M,w} - R_{f,w}$) and find similar results (see Table 1).

[3] The 5 SASB groups (and the 26 GICs) are: **1) Environment** (GHG Emissions, Air Quality, Energy Management, Water & Wastewater Management, Waste & Hazardous Materials Management, and Ecological Impacts), **2) Social Capital** (Human Rights & Community Relations, Customer Privacy, Data Security, Access & Affordability, Product Quality & Safety, Customer Welfare, Selling Practices & Product Labeling), **3) Human Capital** (Labor Practices, Employee Health & Safety, Employee Engagement, Diversity & Inclusion) **4) Business Model & Innovation** (Product Design & Lifecycle Management, Business Model Resilience, Supply Chain Management, Materials Sourcing & Efficiency, Physical Impacts of Climate Change), and **5) Leadership & Governance** (Business Ethics, Competitive Behavior, Management of the Legal & Regulatory Environment, Critical Incident Risk Management, and Systemic Risk Management).

2.4. Sample

I collected from Factset all sustainability and financial data available from all available countries. Given the limitations of the sustainability disclosure variables in Factset, the sample period covers 2021 and 2022. After excluding missing data and countries with less than 30 observations, the final sample includes 27 countries and 18,207 firm-year observations.[4]

3. Results

Table 1 contains the main results. Across all models, the coefficients of *Allcategories* are negative but not significant (t-stats between −0.51 and −0.88). However, the coefficients of *Materiality* are all negative and significant (t-stats between −1.89 and −2.37). Table 1 suggests that the disclosure of material information is correlated with not only lower total risk but also lower idiosyncratic risk. However, the disclosure of non-material information does not correlate with risk. The results suggest that the disclosure of material information plays a pivotal role in enhancing transparency and reducing firms' risks. By providing a clear view of critical operational, financial, and reputational aspects that impact long-term value, such disclosure fosters proactive risk management. However, the disclosure of non-material information, lacking the capacity to significantly affect long-term value, does not yield the same risk-mitigating benefits. In fact, overloading investors with information could make relevant details more opaque, worsening risk management and misleading stakeholders, a situation often called greenwashing (Marquis et al., 2016). Overall, the results in Table 1 suggest that a disclosure policy requires a strategic focus on material information.

Table 2 contains the estimation of Eq. (2) but includes as independent variables the firm's scores in each of the five SASB groups. I find evidence supporting that only *Social Capital* and *Human Capital* scores are correlated with less risk. Among the five groups, these two emerge as potential mitigators of risk probably due to their direct influence on stakeholder relationships. While high *Social Capital* scores suggest a strong community and stakeholder engagement, which reduces reputational risks, *Human Capital* scores, reflecting a skilled workforce and effective employees, enhance operational stability, creativity, and growth, which mitigate employee turnover and other labor-related risks. On the other hand, the other three groups, while critical for overall sustainability, do not exhibit a correlation with risk. *Environmental* factors, for instance, might have complex and varied effects, often materializing over longer periods, while *Business Model and Innovation* and *Leadership and Governance* may impact long-term prospects but also do not seem to show immediate effects on risk, as captured by the stock price risk. Overall, the results in Table 2 show the different nuances of risk management of sustainability issues.

Although I include firm fixed effects to mitigate concerns of omitted variable bias from unobservable time-invariant factors, industry-year fixed effects to control for common shocks at the industry level, and used lagged control variables to mitigate concerns of simultaneity, one limitation of Tables 1 and 2 is that I do not control for additional sources of endogeneity. To mitigate this concern, I used the list of cities marked by the *Disclosure Insight Action* program[5] as Cities A. These cities disclose substantive information through the CDP-ICLEI track system regarding city-wide emissions and are recognized for their environmental actions and transparency. A dummy marking Cities A is a valid instrumental variable (IV) since it fulfills the two necessary conditions: 1) given peer groups and social pressure, companies whose headquarters are located in Cities A are expected to have a greater probability of disclosing material information (i.e., relevance condition); 2) one have no reasons to believe that the city where a company's headquarters is located directly affects firm's risk (i.e., exogeneity condition). Therefore, I used a dummy marking the companies whose headquarters are located in Cities A as an IV of *Materiality*.

Table 3 contains the results of the IV estimation. The first stage supports the validity of the instrument as it shows a positive correlation with *Materiality* while the second stage suggests that *Materiality* has a negative effect on total risk. However, Table 3 suggests that the effect on the idiosyncratic risk is not significant. This is likely because idiosyncratic risks are driven by internal factors such as managerial decisions, operational factors, and the competitive landscape, often extending beyond the scope of material items. This result underscores the multi-dimensional nature of effective risk management in the context of sustainability.

4. Conclusions

The conclusion of this study is threefold. First, I find evidence that firms disclosing more financially material information and that score higher in *Materiality* have lower risk. However, a score that combines both financially material and non-material items does not correlate with risk. Second, the disclosure of issues related to social and human capital seems to drive the negative association between disclosure and risk. Finally, using an IV design, the disclosure of *Material* items only affects firms' total risk, but not idiosyncratic risk.

The main contribution of the article is to investigate the association between risk and the disclosure of sustainable information by focusing on material items. Currently, there is a proliferation of ESG signals making it difficult to differentiate and assess the relevant information of each signal for each firm, creating not only opportunities for corporate greenwashing but also difficulties for investors looking for information to mitigate portfolio risk. My study contributes to the literature by showing that, when investors and

[4] The countries and the number of firm-year observations are: Australia (1,068), Belgium (89), Brazil (197), Canada (1,248), Chile (80), China (1,810), Denmark (94), Finland (124), France (368), Germany (418), Greece (71), India (906), Indonesia (150), Israel (202), Italy (226), Japan (2,378), Netherlands (121), New Zealand (155), Norway (168), Poland (77), South Africa (186), South Korea (717), Spain (140), Sweden (318), Switzerland (233), United Kingdom (1,176), United States (5,487).

[5] < https://www.cdp.net/en/cities/cities-scores >

Table 1
Materiality disclosure and corporate risk.

	$\sigma_{i,t}^{total}$	$\sigma_{i,t}^{total}$	FF 3 factors $\sigma_{i,t}^{idi}$	FF 3 factors $\sigma_{i,t}^{idi}$	CAPM $\sigma_{i,t}^{idi}$	CAPM $\sigma_{i,t}^{idi}$	FF 3 factors $\sigma_{i,t}^{idi_{unlev}}$	FF 3 factors $\sigma_{i,t}^{idi_{unlev}}$	CAPM $\sigma_{i,t}^{idi_{unlev}}$	CAPM $\sigma_{i,t}^{idi_{unlev}}$
All categories	−0.12		−0.19		−0.20		−0.09		−0.10	
	[−0.52]		[−0.83]		[−0.88]		[−0.51]		[−0.54]	
Materiality		−0.41*		−0.41*		−0.44**		−0.39**		−0.41**
		[−1.89]		[−1.94]		[−2.06]		[−2.25]		[−2.37]
Total debt/TA	1.75***	1.75***	1.74***	1.74***	1.84***	1.84***	−6.67***	−6.67***	−6.76***	−6.76***
	[5.56]	[5.56]	[5.54]	[5.54]	[5.85]	[5.86]	[−25.11]	[−25.14]	[−24.99]	[−25.01]
Net PPE/TA	−1.64***	−1.63***	−1.71***	−1.71***	−1.70***	−1.69***	−1.32***	−1.31***	−1.33***	−1.32***
	[−3.20]	[−3.19]	[−3.58]	[−3.57]	[−3.44]	[−3.43]	[−3.42]	[−3.40]	[−3.39]	[−3.38]
Market to book	−0.04***	−0.04***	−0.04***	−0.04***	−0.04***	−0.04***	−0.03***	−0.03***	−0.03***	−0.03***
	[−4.62]	[−4.62]	[−4.67]	[−4.67]	[−4.69]	[−4.69]	[−3.70]	[−3.68]	[−3.71]	[−3.70]
Payout	1.52	1.52	0.78	0.78	0.69	0.69	0.48	0.49	0.41	0.41
	[1.35]	[1.35]	[0.72]	[0.72]	[0.65]	[0.65]	[0.55]	[0.55]	[0.46]	[0.47]
Ln(TA)	−0.48***	−0.48***	−0.45***	−0.45***	−0.54***	−0.54***	−0.29***	−0.29***	−0.36***	−0.36***
	[−4.65]	[−4.66]	[−4.46]	[−4.47]	[−5.16]	[−5.17]	[−3.29]	[−3.30]	[−3.96]	[−3.97]
ROA	−0.06	−0.05	−0.15	−0.15	−0.09	−0.08	−0.12	−0.12	−0.08	−0.08
	[−0.29]	[−0.28]	[−0.73]	[−0.72]	[−0.46]	[−0.44]	[−0.63]	[−0.62]	[−0.43]	[−0.41]
Cash/TA	−1.87***	−1.87***	−1.44***	−1.44***	−1.59***	−1.59***	−0.91***	−0.91***	−1.01***	−1.00***
	[−6.14]	[−6.13]	[−4.80]	[−4.80]	[−5.26]	[−5.25]	[−3.38]	[−3.37]	[−3.67]	[−3.66]
R&D/TA	2.09***	2.09***	1.75**	1.75**	1.91**	1.92**	1.49**	1.49**	1.54**	1.54**
	[2.83]	[2.82]	[2.18]	[2.18]	[2.47]	[2.47]	[2.05]	[2.05]	[2.19]	[2.19]
R-squared	0.120	0.121	0.068	0.068	0.065	0.066	0.186	0.187	0.183	0.184
Observations.	18,207	18,207	18,207	18,207	18,207	18,207	18,207	18,207	18,207	18,207

Obs. t-statistics in brackets. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 2
Materiality disclosure and corporate risk: SASB groups.

	$\sigma_{i,t}^{total}$	FF 3 factors $\sigma_{i,t}^{idi}$	CAPM $\sigma_{i,t}^{idi}$	FF 3 factors $\sigma_{i,t}^{idi_{unlev}}$	CAPM $\sigma_{i,t}^{idi_{unlev}}$
			Panel A		
Environment	−0.33	−0.60	−0.58	−0.39	−0.37
	[−0.78]	[−1.45]	[−1.38]	[−1.21]	[−1.14]
R-squared	0.100	0.028	0.031	0.151	0.151
Observations	14,156	14,156	14,156	14,156	14,156
			Panel B		
Social Capital	−1.45***	−1.23***	−1.32***	−0.98***	−1.07***
	[−3.55]	[−2.96]	[−3.20]	[−2.87]	[−3.13]
R-squared	0.147	0.066	0.068	0.176	0.177
Observations	13,347	13,347	13,347	13,347	13,347
			Panel C		
Human Capital	−0.51	−0.56*	−0.52*	−0.48**	−0.44**
	[−1.64]	[−1.87]	[−1.76]	[−2.15]	[−1.97]
R-squared	0.131	0.043	0.047	0.161	0.159
Observations	12,533	12,533	12,533	12,533	12,533
			Panel D		
Business Model & Innovation	−0.56*	−0.45	−0.39	−0.24	−0.22
	[−1.65]	[−1.37]	[−1.18]	[−0.97]	[−0.87]
R-squared	0.110	0.038	0.042	0.153	0.153
Observations	14,630	14,630	14,630	14,630	14,630
			Panel E		
Leadership & Governance	0.34	0.41	0.42	0.14	0.15
	[0.78]	[0.97]	[0.99]	[0.42]	[0.46]
R-squared	0.136	0.054	0.057	0.174	0.176
Observations	11,894	11,894	11,894	11,894	11,894

Obs. Control variables included but omitted. t-statistics in brackets. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3
Materiality disclosure and corporate risk: IV design.

	First stage	Second stage				
	Materiality	$\sigma_{i,t}^{total}$	FF 3 factors $\sigma_{i,t}^{idi}$	CAPM $\sigma_{i,t}^{idi}$	FF 3 factors $\sigma_{i,t}^{idi_{unlev}}$	CAPM $\sigma_{i,t}^{idi_{unlev}}$
Materiality		−6.46**	−1.94	−2.29	0.36	0.04
		[−2.21]	[−0.68]	[−0.79]	[0.16]	[0.02]
Cities A dummy	0.01***					
	[6.91]					
R-squared	0.011	0.108	0.041	0.044	0.163	0.165
Observations	18,207	18,207	18,207	18,207	18,207	18,207

Obs. Control variables included but omitted. t-statistics in brackets. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

stakeholders want to assess what are the sustainability-related drivers of risk, they could use the materiality matrix provided by SASB and focus on the items that are financially material. The results of this article have relevant implications for not only investors and analysts since it suggests that not all sustainability items are relevant to corporate risk, but also to managers, since it shows which dimensions of sustainability are more relevant to the capital markets.

Declaration of Competing Interest

No conflict of interest has been declared by the author.

Data availability

Data will be made available on request.

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