White Rose Research Online

eprints@whiterose.ac.uk
https://eprints.whiterose.ac.uk
Universities of Leeds, Sheffield and York

Deposited via The University of Sheffield.

White Rose Research Online URL for this paper:
https://eprints.whiterose.ac.uk/id/eprint/190246/

Version: Published Version

Article:
Reber, B., Gold, A. and Gold, S. (2022) ESG disclosure and idiosyncratic risk in initial public offerings. Journal of Business Ethics, 179 (3). pp. 867-886. ISSN: 0167-4544

https://doi.org/10.1007/s10551-021-04847-8

Reuse
This article is distributed under the terms of the Creative Commons Attribution (CC BY) licence. This licence allows you to distribute, remix, tweak, and build upon the work, even commercially, as long as you credit the authors for the original work. More information and the full terms of the licence here: https://creativecommons.org/licenses/

Takedown
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

UNIVERSITY OF LEEDS
University of Sheffield
UNIVERSITY of York

Journal of Business Ethics (2022) 179:867–886
https://doi.org/10.1007/s10551-021-04847-8

ORIGINAL PAPER

ESG Disclosure and Idiosyncratic Risk in Initial Public Offerings

Beat Reber[1] · Agnes Gold[2] · Stefan Gold[2]

Received: 15 December 2020 / Accepted: 20 May 2021 / Published online: 1 June 2021
© The Author(s) 2021

Abstract
Although legitimacy theory provides strong arguments that environmental, social and governance (ESG) disclosure and performance can help mitigate firm-specific (idiosyncratic) risks, this relationship has been repeatedly challenged by conceptual arguments, such as 'transparency fallacy' or 'impression management', and mixed empirical evidence. Therefore, we investigate this relationship in the revelatory case of initial public offerings (IPOs), which represent the first sale of common stock to the wider public. IPOs are characterised by strong information asymmetry between firm insiders and society, while at the same time suffering from uncertainty in firm legitimacy, culminating in amplified financial risks for both issuers and investors in aftermarket trading. Using data from the United States, we demonstrate that (1) voluntary ESG disclosure reduces idiosyncratic volatility and downside tail risk and (2) higher ESG ratings have lower associated firm-specific volatility and downside tail risk during the first year of trading in the aftermarket. We provide theoretical arguments for the relationships observed, suggesting that companies striving for ESG performance and communicating their efforts signal their compliance with sustainability-related norms, thus acquiring and upholding a societal license to operate. ESG performance and disclosure help companies build their reputation capital with investors after going public. We also report that ESG disclosure is a more consistent proxy for ex-ante uncertainty as an indicator of aftermarket risk, thereby replacing some of the more conventional measures, such as firm age, offered in the existing literature.

Keywords ESG · Sustainability · Initial public offerings · Idiosyncratic risk · Information asymmetry · Legitimacy · Ethical business conduct

Introduction

This study analyses the effect of voluntary disclosure of environmental, social and governance (ESG) information and of actual ESG scores in initial public offerings (IPOs) at the time of listing on idiosyncratic risk (i.e. volatility and downside tail risk) in aftermarket trading. Idiosyncratic risk represents firm-specific risk that adds to the general market risks in IPOs. Downside tail risk captures the amount of loss that could be sustained as a result of a decline in a stock's price. ESG disclosure covers a wide spectrum of sustainability-related aspects that are not normally captured in more traditional investment reporting and analysis. Voluntary disclosure at the time of listing can improve the quality of corporate information, reduce information asymmetry in firm value and signal compliance with societal norms concerning sustainable business conduct, which is assumed to lead to increased legitimacy and reduced idiosyncratic risks.

IPOs involve the first sales of companies' common stock to the wider public as firms transition from private to public ownership. IPOs are particularly revelatory when investigating the link between ESG disclosure and idiosyncratic risk scores in the absence of any prior trading history in the stock market before flotation. Private firms have higher information asymmetry between firm insiders and outside investors about future prospects, consistent with the studies of Leland and Pyle (1977), Cole et al. (2004) and Burgstahler et al. (2006). Therefore, it is reasonable to assume that the voluntary disclosure of ESG information at the time of

✉ Stefan Gold
gold@uni-kassel.de

Beat Reber
beat.reber@sheffield.ac.uk

Agnes Gold
a.gold@uni-kassel.de

[1] Sheffield University Management School, Sheffield S10 1FL, UK

[2] Faculty of Economics and Management, University of Kassel, 34117 Kassel, Germany

listing exerts an important signalling effect (Leland & Pyle, 1977; Beatty & Ritter, 1986; Beatty & Welch, 1996) and helps mitigating information asymmetry. ESG disclosure (Eccles et al., 2011) and ESG scores help equity providers develop more confidence that corporate action is deemed suitable or appropriate in the frame of societal norms (Suchman, 1995), thereby supporting firms' strategic objective to maintain or repair societal legitimacy (Lai et al., 2016). On a more general level of business ethics, complementing disclosure of financial information with ESG information may bring virtue to the field of finance by incentivising and facilitating financial actors and businesses to pursue the common good (Sison, 2019), and sustainable development (Galbreath, 2013).

In their meta-analysis, Friede et al. (2015) found strong support for a positive link between ESG performance and corporate financial performance, with the positive relationship being stable over time. On the one hand, ESG disclosure responds to stakeholder demands to match corporate power through increased corporate accountability (Gold & Heikkurinen, 2018) regarding material aspects to maintain a societal license to operate. On the other hand, ESG performance and disclosure, following the motto 'do good and talk about it', represent a powerful instrument to strategically prevent damage to a company, for example, in the form of loss of reputation and brand value, sustainability risks and subsequent financial distress risk and litigation.

Firm performance may take various forms. Among these forms, risk performance is very important because it is linked directly to the predictability and endurance of company success (Orlitzky & Benjamin, 2016), and thus, it is a prime objective of both managers and equity owners. Idiosyncratic risk is a market-based measure of corporate financial performance that is more robust than accounting-based financial performance measures, which do not allow for separating firm-specific risk from total risk and may be subject to different reporting standards and manipulation. Risks related to stock price variability, specifically idiosyncratic risk, may decisively influence success or failure when companies go public. Idiosyncratic risk is an important indicator of IPO performance and survival in the aftermarket. Therefore, we ask the following research question: How do voluntary ESG disclosure and scores at the time of flotation influence the idiosyncratic risk of IPOs in aftermarket trading?

First, we demonstrate that ESG disclosure reduces idiosyncratic volatility, value-at-risk (VaR) and conditional value-at-risk (CVaR) during the first year of trading in the aftermarket. Second, we show that stronger ESG performance reduces volatility and risk. We corroborate arguments from legitimacy theory for the specific case of IPOs by showing that investors appreciate when companies engage in measures and business conduct viewed by society at large as 'proper' and 'appropriate' and then communicate these actions publicly. On the practical side, managers should devise ESG strategies well before going public to shield their companies from the negative repercussions of sustainability incidents, such as litigation, fraud and corruption cases.

The most recent global financial crisis of 2007–2008, which is associated with the massive destruction of wealth and value, highlights the prominent role that ethics should play in finance and accounting (Melé et al., 2017). In this regard, creating transparency and reducing information asymmetries through ESG disclosure are means to empower investors to consider the sustainability aspect in their decisions. Transparency does not necessarily make investors more ethical, but it enables investors who care for people and the planet in the long term to purposefully incorporate their values into their decision-making, thus contributing to the overall improvement of the human condition. In this sense, das Neves and Vaccaro (2013, p. 645) highlight that 'information is a necessary good for understanding, making conscious decisions and following the ultimate Good'.

The remainder of this paper is structured as follows: In the following section, we discuss how legitimacy may explain the effect of ESG disclosure and performance, or sustainability performance in general, on idiosyncratic firm risk, and we develop our hypotheses. Subsequently, we describe the research methods used for testing these hypotheses, including data collection, data analysis and research quality criteria, such as reliability and validity. After presenting the findings from the analysis, we discuss them in the context of previous literature on ESG disclosure and performance, stock-related risk and volatility measures. We then present the study's theoretical contribution and its managerial and ethical implications. We conclude by discussing new insights from our analysis and its limitations. An Internet Appendix provides supporting material.[1]

Background

Sustainability Reporting and Legitimacy

Businesses are increasingly aware of their ethical responsibility to society and the planet and adopt the objective of contributing to sustainable development, which has led to more companies starting to issue sustainability reports in the past few decades (e.g. Gray, 2010; Hahn & Kühnen, 2013; Hossain et al., 2019). This is particularly the case in large companies, as they hold the necessary resources for establishing a sustainability accounting and reporting system

while being exposed to pressure from vigilant stakeholders. Stock-listed companies are more likely to report more extensively on sustainability issues because of mimetic and coercive pressures (Hahn & Kühnen, 2013). Greater corporate transparency is usually associated with greater engagement with sustainability issues, although sceptics have dismissed the link between transparency and responsible as well as ethical business conduct as a 'transparency fallacy', particularly if transparency is imposed by external stakeholder pressure (Gold & Heikkurinen, 2018). Other critics have downplayed sustainability reports' credibility as mostly a symbolic exercise or 'simulacra' (Boiral, 2013), pointing to reporting-performance portrayal gaps (Adams, 2004). Sustainability reports are also referred to as 'fairy tales to help the children sleep at night' (Gray, 2010, p. 50). Beyond this fundamental debate on the degree to which companies 'walk their talk', scholars have frequently connected sustainability reporting, including ESG reporting (Eccles et al., 2011) as a subset, to firms' strategic objective to maintain or repair societal legitimacy (Lai et al., 2016). In fact, legitimacy theory suggests that legitimacy is threatened whenever business conduct is not deemed suitable or appropriate according to societal norms (Suchman, 1995), driving managers to meet societal expectations through corporate action and communication. Having achieved a certain level of standardisation through the Global Reporting Initiative standards or other initiatives, such as the Integrated Reporting Framework (although not comparable with the level of standardisation in financial reporting), business associations and civil society actors broadly support companies engaging in sustainability reporting and its facets (e.g. ESG reporting and integrative reporting). Thus, sustainability reporting is a key form of corporate communication that companies engage in with the strategic objective of decreasing the information asymmetries in their business conduct, thereby dispersing doubts about their societal legitimacy.

ESG and Idiosyncratic Risk of IPOs

Although Friede et al. (2015) report a positive relationship between ESG and corporate financial performance, thus finding evidence for the business case of ESG investing through their meta-analysis, the overall impact of voluntary ESG disclosure remains less than clear cut. For example, studies on the so-called sin stocks (e.g. alcohol, tobacco, gambling and firearms) have found that they outperform various benchmarks (e.g. Trinks & Scholtens, 2017; Hoepner & Schopohl, 2018). Although high ESG ratings appear to be tied to large future stock returns, outperformance has diminished during more recent periods (e.g. Humphrey & Tan, 2009; Borgers et al., 2013). This mixed empirical evidence calls for additional research to which our study aims to contribute. Instead of explaining the relationship between ESG disclosure and risk-adjusted excess returns based on fitted returns using systematic risk factors, we focus on firm-specific risk that cannot be explained by common risk factors in conventional asset-pricing models. Therefore, our definition constitutes a refinement of and an important distinction from the measures used in the extant literature.

To assess the effect of ESG on companies, various aspects of firm performance can be considered, including 'accounting-based performance, market-based performance, operational performance, perceptual performance, growth metrics, risk measures, and the performance of ESG portfolios' (Friede et al., 2015, p. 212). Whereas idiosyncratic risk is based on stock returns and can be seen as a particularly robust and objective measure of corporate financial performance, firm-specific risk has been neglected in previous research on the link between ESG implementation, disclosure and firm performance. As a market-based measure, idiosyncratic risk is a good indicator of IPO performance and survival in the aftermarket (Bhabra & Pettway, 2003; Gregory et al., 2010). It is less amenable to interpretation bias, accounting standards or manipulation (Chahine et al., 2012; Cormier et al., 2014). We contribute to filling this gap in the literature by proposing idiosyncratic risk to capture the financial performance of IPO firms.

Previous studies have shown that highly rated ESG firms have an above-average risk management and control mechanism in place (Galbreath, 2013), which helps companies conduct morally reflective decision-making in their strategic and day-to-day business, and abate unethical practices (Kaptein, 2020). Therefore, it is reasonable to assume that ESG-rated IPOs experience less frequent incidents, such as industrial accidents, fraud or corruption cases, which can make society retract their legitimacy. ESG performance leads to less idiosyncratic risk, although this link has not been investigated yet. Managing idiosyncratic risk, especially downside tail risk, is important for companies because decreasing market capitalisation is likely to accelerate financial distress risk, and overpriced IPOs are likely to trigger litigation cases by investors (Hanley & Hoberg, 2012; Hao, 2011; Lowry & Shu, 2002). This potentially causes reputational damage, including the loss of financial and social capital.

Aside from avoiding negative incidents jeopardising their license to operate, companies that have engaged in ESG measures have an incentive to proactively disclose their efforts and performance, for example, through ESG reporting, to signal their compliance with societal norms. Thus mitigating information asymmetry between companies and external stakeholders, one may assume that idiosyncratic

risk for these companies should decrease. In this respect, IPOs represent a particularly revelatory case. On average, they have a high level of information asymmetry in firm value and future prospects between firm insiders and external stakeholders (e.g. investors). This situation complicates the assessment of firm legitimacy by society and could amplify idiosyncratic risk when firms transition from private to public ownership. We provide an analysis of how ESG disclosure and ratings affect firm-specific risk in the revelatory context of IPOs and their first year of trading in the aftermarket. If ESG ratings and disclosures indeed affect firm-specific risk, then we expect to observe this relationship well in the context of our analysis.

Development of Hypotheses

The link between ESG disclosure and accounting-based or market-based returns has been under intense scholarly scrutiny, with most studies finding a positive relationship (e.g. Platonova et al., 2018). This is consistent with legitimacy theory, which implies that companies responding to societal expectations are rewarded with easier access to various resource pools (Suchman, 1995) controlled by external stakeholders, such as customers, employees or equity holders. Therefore, ESG disclosure helps companies decrease information asymmetries vis-à-vis society by signalling their compliance. Nevertheless, mixed results from research on the ESG disclosure–firm performance nexus calls for more empirical studies with innovative research designs and conceptual models. For example, Grewal et al. (2020) found that stock-listed firms that voluntarily disclose more sustainability information, as identified by the Sustainability Accounting Standards Board (SASB), exhibit greater stock price informativeness, with more accentuated results in companies with more exposure to sustainability issues. In our study, we look at the effect of ESG disclosure for IPOs, which we consider a revelatory case, as the assessment of legitimacy, firm value and future prospects is complicated due to the high levels of information asymmetry between firm insiders and external stakeholders (e.g. investors). Companies that go public are assumed to be under greater stakeholder and investor scrutiny than the more seasoned listed companies. Therefore, we examine the effects of ESG disclosure on idiosyncratic risk, which has been proven to be a good indicator of IPO performance and survival in the aftermarket (Bhabra & Pettway, 2003; Gregory et al., 2010) and a suitable variable for capturing financial risk performance as an effect of ESG disclosure. We conjecture that signalling through voluntary ESG disclosure helps IPO firms mitigate information asymmetry in societal expectations of sustainability, reducing idiosyncratic risk in stock returns. Therefore, we propose the following:

H1 ESG disclosure at the time of flotation is negatively related to the idiosyncratic risk of IPOs during the first year of trading in the aftermarket.

Beyond the question of whether firms disclose actions on ESG matters at all, there is a good reason to assume that environmental management, the efficacy of interaction with society and the quality of the corporate governance system are negatively associated with the various forms of firm risks. In the case of supply chains, Golicic and Smith's (2013) meta-analysis finds a positive link between environmental practices and the market-based, operation-based and accounting-based forms of firm performance. Regarding companies' social performance, Orlitzky and Benjamin's (2016) meta-analytical review reports a reciprocally causal relationship between social performance and financial risk and emphasises the importance of reputation in social responsibility, regardless of company size (Orlitzky, 2001). Social performance has been found to reduce financial risk in the form of volatility during the most recent financial crisis (Bouslah et al., 2018), leading to the conclusion that investment in corporate social responsibility and stakeholder engagement contributes to companies' resilience against external shocks (Sajko et al., 2021). Corporate governance mechanisms are indispensable components of corporate risk management systems, facilitating financial firm performance (e.g. Florio & Leoni, 2017). Failure in corporate governance harms organisational self-control and may even lead to corporate crimes (Yeoh, 2016), especially if combined with internally competitive structures that prevent ethical behaviour among employees (Kulik et al., 2008). In sum, there is reason to assume that performance in the environmental, social and governance dimensions (i.e. ESG performance) reduces companies' risk of negative incidents, which could make external stakeholders withdraw their legitimacy. ESG performance measured as ESG score hence can be expected to decrease idiosyncratic risk. Due to related uncertainties in legitimacy, firm value and future prospects, this relationship can be observed particularly well in IPOs during the first year of trading in the aftermarket. Higher ESG scores disclosed at the time of flotation reflect above-average risk management mechanisms and compliance with sustainability standards. Therefore, we propose the following:

H2 The ESG score disclosed at the time of flotation is negatively related to the idiosyncratic risk of IPOs during the first year of trading in the aftermarket.

Data and Methods

We collected data from multiple sources to construct our sample. ESG data on US IPOs became sporadically available in Refinitiv Eikon from the year 2002 onwards. Accordingly, our sample period was from January 2002 to December 2018. To be included in our sample, IPO deal, stock price and financial statement data must be available aside from ESG data. We only considered IPOs listed on the NYSE, NASDAQ or AMEX. Applying these criteria resulted in a sample of 1312 IPOs, of which 87 disclosed their ESG rating at the time of listing.

IPO deal data and stock market trading data came from Eikon. We used 21 trading days for each month to calculate idiosyncratic risk, consistent with Ritter's (1991) seminal paper measuring long-run return performance. Financial statement data were taken from the Standard and Poor's Compustat database. Data on the aggregate new issue market and IPO founding dates were taken from Ritter (2020). The Federal Reserve Bank of St. Louis (2020) provided price deflators for calculating real dollar prices across the sample period. The updated classifications of the 12-industry sector affiliations, which were originally published by Fama and French (1997), were taken from Fama (2020).

We constructed an additional sample in which we closely matched the IPOs that report ESG ratings with unseasoned equity issues that do not voluntarily disclose ESG data at the time of listing. Our matched sample served as a robustness check to mitigate any potential bias in our findings from an imbalance in observations between ESG-rated and non-ESG-rated IPOs. This imbalance is beyond our control. Firstly, ESG disclosure is voluntary. Secondly, ESG rating information in IPOs is a relatively new phenomenon; thus, there is limited data availability. Richer datasets will eventually become available as more IPOs disclose their ESG ratings as part of their flotation prospectus in the future.

We identified peer companies based on propensity score matching, consistent with the approaches and justifications in the IPO literature (e.g. Chemmanur & Krishnan, 2012; Datta et al., 2015; Greene, 2016). This method generated a balanced subset of IPOs that disclosed ESG data from the original pooled dataset by excluding IPOs that did not disclose any ESG ratings at the time of listing. We matched our ESG-IPOs with non-ESG-IPOs by applying several conditions. First, the matching IPOs must have obtained their listing in the same year and belong to the same Fama–French (1997) 12-industry sector classification. Second, we matched the IPOs based on their propensity scores from ex-ante sales and two ex-post profitability measures. Sales indicated firm size and were based on the most recent fiscal year prior to flotation. Profitability measures indicated the ratio of earnings before interest, depreciation and amortisation (EBITDA) to sales and the ratio of net earnings to sales. Both profitability measures were based on the first fiscal year after flotation. The ESG-IPOs that did not closely match the non-ESG-IPOs available were eliminated from the analysis. This approach generated a sample of 156 closely matched IPOs that did not suffer from an imbalanced sample bias.

Table 1 provides the variable definitions of idiosyncratic risk (Panel A), ESG disclosure and scores (Panel B), firm characteristics (Panel C), IPO deal characteristics (Panel D), and new issue market conditions at the time of listing of the IPOs (Panel E).

Analysing the effect of ESG disclosure or non-disclosure and the effect of ESG scores while controlling for the commonly used stochastic variables from the extant literature is a key part of this study. Whether the ESG measures retain their statistical effect throughout the analysis indicates the importance of disclosure at the time of listing to mitigate firm-specific risk. Therefore, this analysis is consistent with extant research on information asymmetry in IPO value (Leland & Pyle, 1977; Baron, 1982; Rock, 1986) and legitimacy through ESG reporting (Eccles et al., 2011; Lai et al., 2016). The following sections provide the justification for the variable selection and the details of the variable definitions for idiosyncratic risk and ESG scores. The Internet Appendix provides details on control variables, summary statistics and univariate analysis.

Idiosyncratic Risk

We estimated idiosyncratic risk from the residuals of stock return distributions that used fitted values based on capital asset-pricing model (CAPM) or Fama–French's (1993) three-factor asset-pricing model. The focus on idiosyncratic risk is important because, unlike systematic risk, firm-specific risk is not priced in the stock market. Idiosyncratic risk is not priced, as firm-specific risk represents diversifiable business and operational risk that is unique to individual firms. We obtained idiosyncratic risk from the lower tail end of the residual distribution, which shows stock returns that cannot be explained by common risk factors from the two asset-pricing models. This definition determines the business and operational risk of

Table 1 Variable definitions and data sources

Variable	Definition and data source
Panel A: Rrsk measures	
Total volatility	Annualised standard deviation of daily stock returns captures total risk, comprising systematic risk and unsystematic risk for a maximum of 252 days from the listing date, or up to the delisting date, whichever comes first
Idiosyncratic volatility	Annualised standard deviation of the residuals from daily stock returns' regressions on Fama and French's (1993) three-factor model or CAPM (Sharpe, 1964; Lintner, 1965; Mossin, 1966) of individual stocks, for a maximum of 252 days from the listing date, or up to the delisting date, whichever comes first
VaR	Value-at-risk is the maximum loss, measured by the residuals from daily stock returns' regressions on Fama and French's (1993) three-factor model or CAPM (Sharpe, 1964; Lintner, 1965; Mossin, 1966) of individual stocks at confidence level $c = \{0.90, 0.95\}$, for a maximum of 252 days from the listing date, or up to the delisting date, whichever comes first
CVaR	Conditional value-at-risk is the loss beyond the VaR threshold, measured by the residuals from daily stock returns' regressions on Fama and French's (1993) three-factor model or CAPM (Sharpe, 1964; Lintner, 1965; Mossin, 1966) of individual stocks at confidence level $c = \{0.90, 0.95\}$, for a maximum of 252 days from the listing date, or up to the delisting date, whichever comes first
Panel B: economic, social and governance	
ESG disclosure	Zero-one dummy variable, coded one if an IPO firm discloses ESG information at the time of flotation, or else coded zero
ESG score	Refinitiv Eikon provides scores from 0 to 100% for individual firms from company disclosure, capturing information on environmental (resource use, emissions, innovation), social (workforce, human rights, community, product responsibility) and governance (management, shareholders, CSR strategy) based on a comprehensive subset of metrics
Panel C: firm characteristics	
Firm age	The firm's age is the difference between the founding date and listing date, measured by years. Jay Ritter's (2020) website provides founding dates
Industry dummies	Zero-one dummy variables capturing Fama and French's (1997) SIC classification, coded one for IPOs in business equipment, healthcare, manufacturing, consumer durables, wholesale and retail, and telephone and television transmission, or else coded zero
Sales	Sales in millions of dollars measured in real dollars at 2002 price levels from the Federal Reserve Bank of St. Louis (2020) during the fiscal year ending before the date of flotation
Net income/sales	Ratio of net income to sales at the end of the first fiscal year after the date of flotation
EBITDA/sales	Ratio of earnings before interest, tax, depreciation and amortisation to sales at the end of the first fiscal year after the date of flotation
Panel D: offer characteristics	
Bookrunner reputation	Bookrunner reputation captures the average market share of lead underwriters participating in an IPO syndicate consistent with the proxy measure for reputation in Megginson and Weiss (1991). Market share is based on the offer's dollar amount during the calendar year as the listing date of an IPO to account for changes in reputation capital during the sample period
Equity retention	Leland and Pyle's (1977) signal of IPO quality: Equity Retention $= EQ + \ln(1 - EQ)$, in which EQ is the proportion of equity retained by pre-IPO owners in the post-flotation firm
Primary shares	The ratio of primary shares to the total number of shares offered in an IPO measures the proportion of offer proceeds at the issuer's disposal
Use of proceeds	Number of uses of IPO proceeds disclosed in the flotation prospectus
Offer size	Total amount of proceeds in millions of dollars measured in real dollars at 2002 price levels from the Federal Reserve Bank of St. Louis (2020)
Panel E: new issues market conditions	
Heat volume	The heat volume zero-one dummy variable that captures hot new issues market conditions, coded one if the number of IPOs in a quarter is 50% greater than the three-monthly moving average, or else coded zero

Panel A presents measures of risk. Panel B provides details on environmental, social and governance (ESG) disclosures and their corresponding scores. Panel C provides details on firm characteristics. Panel D lists offer characteristics. Panel E presents new issues market conditions. ESG information, stock price and trading data are from Refinitiv Eikon. Financial statement data are from Standard and Poor's Compustat files. Aggregate IPO data and firms' founding dates are from Jay Ritter's (2020) website. Industry sector classifications and asset-pricing factors are from Fama and French (1997) and Fama's (2020) resources

ESG-disclosing versus non-ESG-disclosing IPOs and identifies whether the differences between these two samples are statistically significant.

We estimated idiosyncratic risk (Panel A of Table 1) by following Bali et al. (2009), Boyer et al. (2010), and Atilgan et al. (2020). $\varepsilon_{i,d}$ denotes the regression residual of either the CAPM (Lintner, 1965; Mossin, 1966; Sharpe, 1964) or Fama–French's (1993) three-factor asset-pricing model on day d for firm i during the trading period of T days. $S(t)$ is the set of trading days from the first day of trading[2] through the end of $T=252$ days, or the delisting date, whichever comes first considered for the set of $d \in S(t)$:

$$r_{i,d,t} - r_{f,d,t} = \alpha_{i,t} + \beta_{i,t} RMF_{d,t} + \varepsilon_{i,d,t} \quad (1)$$

$$r_{i,d,t} - r_{f,d,t} = \alpha_{i,t} + \beta_{i,t} RMF_{d,t} + \beta_{i,t} SMB_{d,t} + \beta_{i,t} HML_{d,t} + \varepsilon_{i,d,t} \quad (2)$$

where $r_{i,d,t}$ and $r_{f_{d,t}}$ are the return on stock i and the risk-free rate on day d during $S(t)$, respectively; $RMF_{d,t}$ is the market excess return; $SMB_{d,t}$ is the return on the small minus big portfolios; and $HML_{d,t}$ is the high minus low portfolios on day d, as defined in Fama and French (1993). We used $\varepsilon_{i,d,t}$ from (1) and (2) on day d for firm i during $S(t)$ to calculate three idiosyncratic risk measures.

Idiosyncratic volatility is the first measure:

$$\textit{Idiosyncratic volatility} = \left(\frac{1}{N_t - 1} \sum_{d=1}^{N_t} \varepsilon_{i,d,t}^2 \right)^{1/2} \sqrt{T} \quad (3)$$

where Nt is the number of trading days during the set of trading days $S(t)$. Volatility is perhaps the most traditional measure of risk, but this definition ignores the direction of stock price movement. Volatility (standard deviation) includes both upside and downside risks (positive or negative returns) from an investment, but it is likely that investors are more concerned with downside risk than upside risk.

VaR and CVaR are the second and third measures of idiosyncratic risk, following Artzner et al.'s (1999) definitions. Both VaR and CVaR denote downside tail risk. VaR is an estimate of the maximum loss $\varepsilon_{i,d,t}$ during the holding period $S(t)$ within a fixed confidence level c. VaR at the $100(1-c)\%$ confidence level measures the upper $100c$ percentile of the loss distribution X of $\varepsilon_{i,d,t}$:

$$VaR_c(X) = \sup \{x | P[X \geq x] > c | \} \quad (4)$$

where sup {x|M} is the upper limit of x, given an event M, and sup {x|P [X ≥ x] > c} is the upper $100c$ percentile of the loss distribution X of $\varepsilon_{i,d,t}$.

CVaR measures the expected tail loss of $\varepsilon_{i,d,t}$ beyond the VaR threshold during the holding period $S(t)$ within a fixed confidence level c.

$$CVaR_c(X) = E\left[X | X \geq VaR_c(X)\right] \quad (5)$$

CVaR measures the average tail loss of $\varepsilon_{i,d,t}$ that exceeds the VaR. Artzner et al. (1999) recommend the use of CVaR to mitigate some of the limitations inherent in VaR.

ESG Characteristics

We used voluntary ESG disclosure or non-ESG disclosure and ESG scores, as detailed in Panel B of Table 1. The ESG scores from Eikon Refinitiv measure firms' relative performance across 10 main themes and represent the environmental (resource use, emissions, innovation), social (product responsibility, human rights, community, workforce) and governance (management, shareholders, corporate social responsibility strategy) pillars.[3] The advantage of Eikon Refinitiv over alternative databases is that its metrics are transparent and based on data in the public domain. Therefore, it is not surprising that many studies use Eikon Refinitive as a reliable data source (e.g.; Ibikunle & Steffen, 2017; Platonova et al., 2018; Stolowy & Paugam, 2018; Drempetic et al., 2020; Giannarakis et al., 2020; Duque-Grisales & Aguilera-Caracuel, 2021). Still, ESG scores provided by third-parties should be considered as a research tool rather than a source of authority (e.g. Schoenmaker & Schramade, 2019; Signori, 2021). Not all ESG factors are easily quantifiable and the construction of an aggregate index is to some degree arbitrary. The current disclosure of ESG scores is skewed towards self-declaration, processes and may not consistently reflect actual performance.

Effect of ESG Disclosure on Idiosyncratic Risk

ESG disclosure has consistent negative relationships with idiosyncratic volatility and downside tail risk. The measures of downside tail risk include VaR and CVaR at different confidence levels and based on different asset-pricing models. ESG disclosure at the time of listing reduces subsequent idiosyncratic volatility in the aftermarket. Interestingly, ESG disclosure did not statistically significantly affect total volatility. This finding is different from that of our univariate analysis, in which we did not simultaneously control for other factors. In controlling for other factors, which constitute a more stringent test, ESG disclosure cannot explain the variation in total volatility at conventional significance levels. One possible reason for the explanatory

variables having reduced statistical significance is the loss of degrees of freedom when simultaneously controlling for several factors in the multivariate analysis. Another possible scenario is the presence of multicollinearity in the predictor variables. However, tests showed that our regression models were unaffected by multicollinearity, as evidenced by the variance inflation factor. Therefore, our findings confirm the importance of direct ESG disclosure on firm-specific volatility, which includes both downside and upside risks. Investors are perhaps more concerned with downside tail risk in terms of the potential losses they could incur from their investments.

Moreover, our analysis showed a reduced idiosyncratic downside tail risk for IPOs that report ESG measures. Downside tail risk includes VaR and CVaR across various confidence levels based on different capital asset-pricing models. These findings are robust after controlling for firm characteristics, industry sector affiliation, IPO deal characteristics and new issue market conditions, thus confirming H1. The analysis supports the assumption that newly stock-listed companies that report their ESG matters serve the information demands of investors and other stakeholders (Eccles et al., 2011; Gold & Heikkurinen, 2018). Therefore, the stock price informativeness is enhanced (Grewal et al., 2020), and their preoccupation with complying with sustainability as a globally accepted societal norm is conveyed, although this norm manifests somewhat differently across global regions (Shinkle and Spencer, 2012). In addition, ESG disclosure fosters firm performance, particularly in terms of its risk aspects, consistent with previous research on the link between sustainability disclosure and performance (e.g. Platonova et al., 2018).

Tables 2, 3 and 4 provide the details of the effect of ESG disclosure on total volatility, idiosyncratic volatility and idiosyncratic downside tail risk.

We observed no association between ESG disclosure and total risk (Model 1 in Table 2). By comparison, ESG disclosure appeared to be associated with lower idiosyncratic volatility (Models 2 and 3 in Table 2) and idiosyncratic downside tail risk, as measured by VaR (Table 3) and CVaR (Table 4), at different confidence levels and across asset-pricing models.

As a proxy for ex-ante uncertainty and information asymmetry in IPO value between the new issue market participants, firm age could not explain the variation in any of the risk measures, and thus our findings contradict earlier studies (Ritter, 1984, 1991; Megginson & Weiss, 1991; Xu & Malkiel, 2003; Pastor & Veronesi, 2003; Fink et al., 2010). In sum, direct ESG disclosure contributes more to reducing idiosyncratic risk than the length of time an IPO has been operating before its stock market listing.

Table 2 The impact from ESG disclosure or non-disclosure on total volatility and idiosyncratic volatility

	log (Total volatility)	log (Idiosyncratic volatility)	
	(1)	(2)	(3)
ESG disclosure	− 0.069	− 0.080*	− 0.082*
	(0.042)	(0.043)	(0.043)
log (Firm age)	− 0.014	− 0.016	− 0.015
	(0.014)	(0.014)	(0.014)
Business	0.331***	0.341***	0.342***
	(0.029)	(0.029)	(0.029)
Health	0.451***	0.476***	0.471***
	(0.029)	(0.029)	(0.029)
Manufacturing	0.252***	0.245***	0.244***
	(0.049)	(0.049)	(0.049)
Consumer durables	0.217**	0.201**	0.198**
	(0.091)	(0.092)	(0.093)
Wholesale and retail	0.200***	0.213***	0.214***
	(0.035)	(0.036)	(0.036)
Telephone and television	0.083	0.103	0.109
	(0.077)	(0.078)	(0.078)
Bookrunner reputation	− 0.003*	− 0.005**	− 0.005**
	(0.002)	(0.002)	(0.002)
Equity retention	− 0.122***	− 0.130***	− 0.128***
	(0.033)	(0.033)	(0.033)
Primary shares	0.041	0.056	0.053
	(0.041)	(0.041)	(0.041)
log (1 + Use of proceeds)	0.158***	0.161***	0.161***
	(0.033)	(0.034)	(0.033)
1/Offer size	5.271***	5.860***	6.043***
	(0.874)	(0.897)	(0.903)
Heat volume	0.060*	0.055	0.056
	(0.036)	(0.035)	(0.035)
Constant	− 1.304***	− 1.382***	− 1.397***
	(0.079)	(0.078)	(0.078)
Observations	1,312	1,312	1,312
R^2	0.354	0.387	0.388
Adjusted R^2	0.347	0.380	0.382

This table reports the impact from ESG disclosure for 1316 IPOs from 2002 to 2018 on total volatility (Model 1) and idiosyncratic volatility (Models 2 and 3)

Total volatility is the annualised standard deviation of daily returns for the first 252 trading days from the listing date, or up to the delisting date, whichever comes first. Idiosyncratic volatility is regression residuals' annualised standard deviation from CAPM (Sharpe 1964; Lintner, 1965; Mossin, 1966) or Fama and French's (1993) three-factor asset-pricing model (Models 2 and 3) for the first 252 trading days from the listing date, or up to the delisting date, whichever comes first. Daily stock returns include any delisting returns if applicable. ESG is a zero-one dummy variable that captures these factors' disclosure (coded one) or non-disclosure (coded zero). Firm age is the number of years between the founding date and the flotation. Industry sec-

Table 2 (continued)

tor dummy variables capture the affiliation of IPOs with the following SIC classifications: business; health; manufacturing; consumer durables; wholesale and retail; and telephone and television transmission. Bookrunner reputation measures the average market share of lead underwriters making up a syndicate commensurate with the year of listing. Equity retention denotes Leland and Pyle's (1977) signal of firm quality by firm insiders to outside investors, measured by the proportion of equity retained by pre-IPO owners in the post-flotation firm. The ratio of primary shares to total shares measures the proportion of new money raised. Use of proceeds captures the number of uses of proceeds disclosed in the flotation prospectus. Offer amount is the total proceeds in millions of dollars measured in real dollars at 2002 price levels. Heat number is a zero-one dummy variable, coded one if the number of IPOs in a quarter of the year is 50% greater than the three-month moving average, or else coded zero. More detailed variable definitions and data sources are available from Table 1. Figures in parentheses below the estimated coefficients are heteroskedastic-consistent standard errors. ***, ** and * denote 1%, 5% and 10% significance, respectively

The industry sector dummy variables denote the ex-ante uncertainty and the differences in business risk, as well as explain the variation in volatility and downside risk. Manufacturing, consumer durables, wholesale and retail have increased volatility and downside tail risk. Consistent with our findings, previous studies (Ritter, 1984, 1991; Purnanandam & Swaminathan, 2004; Jeon et al., 2015) have also reported industry differences in explaining the initial return and the long-term stock return performance of IPOs.

The average market share of lead underwriters participating in an IPO syndicate has a negative association with all risk measures. Underwriter reputation capital has a statistically marginal effect on total volatility, while its statistical effect on idiosyncratic volatility and idiosyncratic downside tail risk is stronger. Therefore, our findings correspond with the third-party certification effect (Carter & Manaster, 1990; Megginson & Weiss, 1991).

Equity retention exhibited consistently negative coefficients in all models. As Leland and Pyle's (1977) data transformation gives negative values, the relationship observed in our models suggests a positive association between equity retained, total volatility, idiosyncratic volatility and idiosyncratic downside tail risk. Our findings correspond with those of Roll (1988), Durnev et al. (2003) and Piotroski and Roulstone (2004), who claim that higher equity retention levels translate to more firm-specific return variation.

The fraction of primary shares offered to total shares outstanding at flotation, which measures the proportion of new money at issuers' disposal, does not explain the variations in any of our risk measures. In contrast to Durnev et al. (2004), we did not find a statistically significant association between the proportion of primary shares issued and any of the risk measures when simultaneously controlling for other factors. We detected only a statistically significant difference in the proportion of primary shares between ESG disclosure and non-ESG disclosure in the univariate context.

Consistent with our prediction, the higher the number of uses of proceeds, the greater the total risk, idiosyncratic volatility and downside risk. Therefore, our findings are consistent with those of Beatty and Ritter (1986). A higher number of uses of proceeds increases the risk of investment and how firms will manage these proceeds in the future.

We observed a positive relationship between IPO size and all risk measures. As larger offers have higher total risk, idiosyncratic volatility and downside tail risk, our findings do not support the negative association between initial return and gross proceeds, as reported in earlier studies (Beatty & Ritter, 1986; Ritter, 1987; Carter, 1992).

The effect of the new equity issue market conditions was inconsistent across the different risk measures. We found a marginally positive effect of hot new equity market conditions at the time of listing on total volatility. Hot new equity issue markets did not affect idiosyncratic volatility but seemed to positively affect downside tail risk, except the VaR at a 0.9 confidence level for CAPM estimates.

To corroborate our findings, we completed a robustness check based on propensity score analysis by matching firms with identical or similar features other than voluntary disclosure or non-disclosure of ESG data. Propensity score matching is widely used in the literature to overcome a potential bias in the findings that could originate from an imbalanced dataset in which a subsample is proportionally underrepresented (e.g. Neophytou & Mar Molionero, 2004). We created a balanced subset of IPOs that disclose ESG data from our original dataset by excluding IPOs that do not voluntarily disclose ESG data. We applied several conditions to identify closely matched peer firms by following the methods of Chemmanur & Krishnan (2012), Datta et al. (2015), and Greene (2016). The first condition requires exact matching between firms that obtained a listing in the same year and operate in the same Fama–French (1997) 12-industry sector classification. From this set of matches, we identified and matched IPOs with the highest propensity score based on firm size and profitability. The sales of the most recent fiscal year ending prior to the flotation date were used as the proxy measure for firm size. The ratios of net income to sales and EBITDA to sales at the end of the first fiscal year after the flotation date were used as the two proxy measures for profitability. This procedure generated a sample of closely matched IPOs that were not subjected to imbalanced observations between voluntary ESG disclosure and

Table 3 The impact from ESG disclosure or non-disclosure on idiosyncratic value-at-risk

	CAPM		Fama-French three-factor	
	log ($VaR_{0.95}$)	log ($VaR_{0.90}$)	log ($VaR_{0.95}$)	log ($VaR_{0.90}$)
	(1)	(2)	(3)	(4)
ESG disclosure	− 0.090**	− 0.082**	− 0.094**	− 0.081**
	(0.039)	(0.038)	(0.040)	(0.039)
log (Firm age)	− 0.016	− 0.011	− 0.014	− 0.006
	(0.012)	(0.012)	(0.012)	(0.012)
Business	0.313***	0.301***	0.307***	0.299***
	(0.026)	(0.026)	(0.026)	(0.026)
Health	0.427***	0.434***	0.422***	0.419***
	(0.026)	(0.026)	(0.026)	(0.026)
Manufacturing	0.208***	0.216***	0.211***	0.203***
	(0.050)	(0.050)	(0.050)	(0.050)
Consumer durables	0.195**	0.169**	0.197**	0.149**
	(0.076)	(0.067)	(0.077)	(0.073)
Wholesale and retail	0.190***	0.195***	0.194***	0.181***
	(0.033)	(0.032)	(0.033)	(0.032)
Telephone and television	0.074	0.046	0.074	0.039
	(0.076)	(0.074)	(0.076)	(0.074)
Bookrunner reputation	− 0.005***	− 0.005***	− 0.005***	− 0.005***
	(0.002)	(0.002)	(0.002)	(0.002)
Equity retention	− 0.122***	− 0.131***	− 0.115***	− 0.129***
	(0.030)	(0.030)	(0.030)	(0.030)
Primary shares	0.055	0.056	0.042	0.043
	(0.037)	(0.037)	(0.037)	(0.037)
log (1 + Use of proceeds)	0.127***	0.133***	0.135***	0.147***
	(0.030)	(0.030)	(0.030)	(0.030)
1/Offer size	4.808***	4.779***	4.952***	4.984***
	(0.799)	(0.793)	(0.806)	(0.802)
Heat volume	0.061*	0.047	0.070**	0.055*
	(0.033)	(0.032)	(0.032)	(0.032)
Constant	− 3.700***	− 4.037***	− 3.719***	− 4.075***
	(0.069)	(0.068)	(0.068)	(0.068)
Observations	1312	1312	1312	1312
R^2	0.381	0.386	0.380	0.380
Adjusted R^2	0.374	0.380	0.373	0.374

This table reports the impact from ESG disclosure or non-disclosure for 1316 IPOs from 2002 to 2018 on idiosyncratic downside risk. Value-at-risk is the maximum loss, measured by regression residuals from CAPM (Sharpe, 1964; Lintner, 1965; Mossin, 1966) or Fama and French's (1993) three-factor asset-pricing model for the first 252 trading days from the listing date, or up to the delisting date, whichever comes first. Daily stock returns include any delisting returns if applicable. ESG is a zero-one dummy variable that captures these factors' disclosure (coded one) or non-disclosure (coded zero). Firm age is the number of years between the founding date and the flotation. Industry sector dummy variables capture IPOs' affiliation with the following SIC classifications: business; health; manufacturing; consumer durables; wholesale and retail; and telephone and television transmission. Bookrunner reputation measures the average market share of lead underwriters making up a syndicate commensurate with the listing year. Equity retention denotes Leland and Pyle's (1977) signal of firm quality by firm insiders to outside investors, measured by the proportion of equity retained by pre-IPO owners in the post-flotation firm. The ratio of primary shares to total shares measures the proportion of new money raised. Use of proceeds captures the number of uses of proceeds disclosed in the flotation prospectus. Offer amount is the total proceeds in millions of dollars, measured in real dollars at 2002 price levels. Heat number is a zero-one dummy variable, coded one if the number of IPOs in a quarter of the year is 50% greater than the three-month moving average, or else coded zero. More detailed variable definitions and data sources are available from Table 1. Figures in parentheses below the estimated coefficients are heteroskedastic-consistent standard errors. ***, ** and * denote 1%, 5% and 10% significance, respectively

Table 4 The impact from ESG disclosure or non-disclosure on idiosyncratic conditional value-at-risk

	CAPM		Fama-French three-factor	
	log ($CVaR_{0.95}$)	log ($CVaR_{0.90}$)	log ($CVaR_{0.95}$)	log ($CVaR_{0.90}$)
	(1)	(2)	(3)	(4)
ESG disclosure	−0.079*	−0.082**	−0.079*	−0.081**
	(0.042)	(0.040)	(0.042)	(0.041)
log (Firm age)	− 0.021	− 0.017	− 0.020	− 0.016
	(0.013)	(0.013)	(0.013)	(0.013)
Business	0.355***	0.336***	0.356***	0.337***
	(0.030)	(0.028)	(0.029)	(0.028)
Health	0.426***	0.427***	0.421***	0.421***
	(0.028)	(0.027)	(0.028)	(0.026)
Manufacturing	0.231***	0.221***	0.233***	0.222***
	(0.052)	(0.050)	(0.052)	(0.051)
Consumer durables	0.226**	0.206**	0.216**	0.202**
	(0.094)	(0.085)	(0.095)	(0.087)
Wholesale and retail	0.222***	0.209***	0.224***	0.211***
	(0.038)	(0.036)	(0.038)	(0.035)
Telephone and television	0.102	0.086	0.108	0.092
	(0.087)	(0.082)	(0.087)	(0.082)
Bookrunner reputation	− 0.006***	− 0.005***	− 0.005***	− 0.005***
	(0.002)	(0.002)	(0.002)	(0.002)
Equity retention	− 0.117***	− 0.119***	− 0.112***	− 0.115***
	(0.033)	(0.031)	(0.033)	(0.031)
Primary shares	0.060	0.055	0.055	0.050
	(0.042)	(0.040)	(0.042)	(0.040)
log (1 + Use of proceeds)	0.165***	0.154***	0.166***	0.158***
	(0.033)	(0.032)	(0.033)	(0.032)
1/Offer size	4.745***	4.764***	4.982***	4.993***
	(0.809)	(0.797)	(0.816)	(0.804)
Heat volume	0.087**	0.075**	0.086**	0.077**
	(0.037)	(0.034)	(0.037)	(0.034)
Constant	− 3.368***	− 3.589***	− 3.386***	− 3.612***
	(0.075)	(0.071)	(0.075)	(0.071)
Observations	1,312	1,312	1,312	1,312
R^2	0.354	0.372	0.357	0.374
Adjusted R^2	0.347	0.365	0.350	0.368

This table reports the impact from ESG disclosure or non-disclosure for 1316 IPOs from 2002 to 2018 on idiosyncratic downside risk. Conditional value-at-risk is the loss beyond the value-at-risk threshold, measured by regression residuals from CAPM (Sharpe, 1964; Lintner, 1965; Mossin, 1966) or Fama and French's (1993) three-factor asset-pricing model for the first 252 trading days from the listing date, or up to the delisting date, whichever comes first. Daily stock returns include any delisting returns if applicable. ESG is a zero-one dummy variable and captures disclosure (coded one) or non-disclosure (coded zero) of these factors. Firm age is the number of years between the founding date and the flotation. Industry sector dummy variables capture IPOs' affiliation with the following SIC classifications: business; health; manufacturing; consumer durables; wholesale and retail; and telephone and television transmission. Bookrunner reputation measures the average market share of lead underwriters making up a syndicate commensurate with the listing year. Equity retention denotes Leland and Pyle's (1977) signal of firm quality by firm insiders to outside investors, measured by the proportion of equity retained by pre-IPO owners in the post-flotation firm. The ratio of primary shares to total shares measures the proportion of new money raised. Use of proceeds captures the number of uses of proceeds disclosed in the flotation prospectus. Offer amount is the total proceeds in millions of dollars, measured in real dollars at 2002 price levels. Heat number is a zero-one dummy variable, coded one if the number of IPOs in a quarter of the year is 50% greater than the three-month moving average, or else coded zero. More detailed variable definitions and data sources are available from Table 1. Figures in parentheses below the estimated coefficients are heteroskedastic-consistent standard errors. ***, ** and * denote 1%, 5% and 10% significance, respectively

Table 5 The impact from ESG disclosure or non-disclosure on idiosyncratic risk using matched IPOs

	Panel A: CAPM					
	log (Total volatility)	log (Idiosyncratic volatility)	log ($VaR_{0.95}$)	log ($VaR_{0.90}$)	log ($CVaR_{0.95}$)	log ($CVaR_{0.90}$)
	(1)	(2)	(3)	(4)	(5)	(6)
ESG disclosure	− 0.093	− 0.094*	− 0.122**	− 0.104**	− 0.130**	− 0.120**
	(0.058)	(0.052)	(0.052)	(0.049)	(0.058)	(0.054)
log (Firm age)	− 0.181***	− 0.198***	− 0.179***	− 0.167***	− 0.198***	− 0.189***
	(0.036)	(0.033)	(0.033)	(0.032)	(0.037)	(0.034)
Bookrunner reputation	− 0.001	− 0.002	0.001	− 0.001	− 0.002	− 0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
Equity retention	− 0.169**	− 0.183***	− 0.144**	− 0.143**	− 0.177**	− 0.164**
	(0.068)	(0.059)	(0.059)	(0.057)	(0.071)	(0.065)
Primary shares	− 0.045	− 0.006	0.018	0.002	− 0.016	− 0.011
	(0.089)	(0.077)	(0.077)	(0.076)	(0.089)	(0.083)
log (1 + Use of proceeds)	0.170**	0.180**	0.138*	0.149**	0.204**	0.188**
	(0.078)	(0.071)	(0.071)	(0.070)	(0.079)	(0.073)
1/Offer size	5.322*	5.578**	6.079***	5.789**	4.870*	5.357**
	(2.878)	(2.200)	(2.200)	(2.896)	(2.518)	(2.422)
Constant	− 0.581***	− 0.648***	− 3.049***	− 3.395***	− 2.677***	− 2.926***
	(0.199)	(0.177)	(0.177)	(0.173)	(0.197)	(0.183)
Observations	156	156	156	156	156	156
R^2	0.368	0.408	0.425	0.407	0.411	0.431
Adjusted R^2	0.338	0.380	0.398	0.379	0.383	0.405
	Panel B: Fama-French three-factor asset-pricing model					
	log (Total volatility)	log (Idiosyncratic volatility)	log ($VaR_{0.95}$)	log ($VaR_{0.90}$)	log ($CVaR_{0.95}$)	log ($CVaR_{0.90}$)
	(1)	(2)	(3)	(4)	(5)	(6)
ESG disclosure	− 0.093	− 0.095*	− 0.111*	− 0.089*	− 0.130**	− 0.120**
	(0.058)	(0.051)	(0.058)	(0.054)	(0.056)	(0.051)
log (Firm age)	− 0.181***	− 0.197***	− 0.172***	− 0.173***	− 0.198***	− 0.189***
	(0.036)	(0.032)	(0.037)	(0.034)	(0.033)	(0.030)
Bookrunner reputation	− 0.001	− 0.002	0.0003	− 0.0003	− 0.002	− 0.001
	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)
Equity retention	− 0.169**	− 0.185***	− 0.146**	− 0.146**	− 0.177***	− 0.164***
	(0.068)	(0.059)	(0.071)	(0.065)	(0.061)	(0.056)
Primary shares	− 0.045	− 0.011	0.001	− 0.014	− 0.016	− 0.011
	(0.089)	(0.077)	(0.089)	(0.083)	(0.094)	(0.087)
log (1 + Use of proceeds)	0.170**	0.182**	0.154*	0.161**	0.204***	0.188***
	(0.078)	(0.071)	(0.079)	(0.073)	(0.077)	(0.071)
1/Offer size	5.322*	5.743***	6.335**	5.987**	4.870*	5.357**
	(2.878)	(2.121)	(2.518)	(2.422)	(2.483)	(2.285)
Constant	− 0.581***	− 0.668***	− 3.108***	− 3.413***	− 2.677***	− 2.926***
	(0.199)	(0.173)	(0.197)	(0.183)	(0.198)	(0.182)
Observations	156	156	156	156	156	156
R^2	0.368	0.408	0.423	0.415	0.411	0.431
Adjusted R^2	0.338	0.380	0.396	0.387	0.383	0.405

This table reports the impact from ESG disclosure or non-disclosure for a subsample of comparable IPOs on risk. Comparable firms are from the same Fama and French (1997) 12-digit industry sector and year of listing that have the closest propensity scores, which rely on sales, EBITDA/sales and net income/sales. Sales are from the fiscal year ending before the listing date. Both EBITDA/sales and net income/sales are from the

Table 5 (continued)

fiscal year following the listing date. Total volatility is the annualised standard deviation of systematic risk and idiosyncratic risk. Idiosyncratic volatility is the annualised standard deviation in the residuals from Sharpe's (Sharpe) CAPM (Sharpe, 1964; Lintner, 1965; Mossin, 1966) (Panel A) and from Fama and French (1993) three-factor asset-pricing model (Panel B). Downside risk is the value-at-risk and conditional value-at-risk for confidence levels ($c = 0.90, 0.95$) of regression residuals. Daily stock returns include any delisting returns if applicable. ESG is a zero-one dummy variable and captures these factors' disclosure (coded one) or non-disclosure (coded zero). Firm age is the number of years between the founding date and flotation. Bookrunner reputation measures the average market share of lead underwriters making up a syndicate commensurate with the listing year. Equity retention denotes Leland and Pyle's (1977) signal of firm quality by firm insiders to outside investors, measured by the proportion of equity retained by pre-IPO owners in the post-flotation firm. The ratio of primary shares to total shares measures the proportion of new money raised. Use of proceeds captures the number of uses of proceeds disclosed in the flotation prospectus. Offer amount is the total proceeds in millions of dollars, measured in real dollars at 2002 price levels. Heat number is a zero-one dummy variable, coded one if the number of IPOs in a quarter of the year is 50% greater than the three-month moving average, or else coded zero. More detailed variable definitions and data sources are available from Table 1. Figures in parentheses below the estimated coefficients are heteroskedastic-consistent standard errors. ***, ** and * denote 1%, 5% and 10% significance, respectively

non-disclosure. The findings of the robustness checks are presented in Table 5.

The matching firm approach confirms that ESG disclosure reduces idiosyncratic risk, as measured by volatility, VaR and CVaR at different confidence levels and across various asset-pricing models. However, ESG disclosure does not explain the variation in total volatility. These findings are consistent with the estimates from our pooled sample reported in Tables 2, 3 and 4. Although some of the control variables related to firm attributes and IPO deal characteristics dipped in and out of statistical significance at different stages of the estimation process, ESG disclosure remained statistically significant throughout, demonstrating its importance in reducing idiosyncratic risk in aftermarket trading.

IPOs involving older firms had a lower risk than younger firms. Firm age was statistically significant in the matched sample, consistent with Beatty and Ritter's (1986) findings. Therefore, the findings related to the statistical significance of this variable and the matched sample in Table 5 diverged from those reported in Tables 2, 3 and 4.

Whereas firm age gained statistical significance, the effect of lead underwriter reputation lost its statistical significance in the matched sample estimations. Therefore, Carter and Manaster's (1990) third-party certification effect diminished once the ESG-rated and non-ESG-rated IPOs were matched in terms of firm size, profitability, industry sector affiliation and year of listing.

Higher equity retentions have higher volatility and downside tail risk. These findings are consistent with the estimations reported in Tables 2, 3 and 4, and they correspond with those of Roll (1988), Durnev et al. (2003) and Piotroski and Roulstone (2004). These authors also claimed that higher equity retention levels translate to more firm-specific return variations.

Our estimations did not have a statistically significant effect on the ratio of new shares offered to total shares outstanding for the matched sample, which is consistent with the findings from the pooled sample reported earlier. Therefore, the proportion of new money raised was unable to explain the variation in financial risk while simultaneously controlling for a number of factors across all estimation models, in contrast to Durnev et al. (2004). Only a statistically significant difference was detected in the mean and median of the proportion of new shares in the univariate analysis.

The relationship between the number of uses of proceeds in the matched sample estimations and the risk measures is consistent with the findings reported earlier. Therefore, the number of uses of proceeds is a stable predictor of risk levels in aftermarket trading. These results are consistent with those of Beatty & Ritter (1986), who found a positive correlation between the number of uses of proceeds and the initial return.

Larger offerings have higher volatility and downside tail risk than smaller IPOs. Both the matched and pooled sample estimations were consistent in their predictions. These findings differ from those of earlier studies (Beatty & Ritter, 1986; Ritter, 1987; Carter, 1992).

ESG Scores Explain the Variation in Idiosyncratic Risk

The previous section established that ESG disclosure reduces idiosyncratic risk and that its effect on total risk is statistically insignificant. Therefore, in this section, we discuss whether ESG scores can explain the variation in idiosyncratic volatility and downside tail risk. Our estimations in Table 6 demonstrate the relation between ESG scores and idiosyncratic volatility, VaR and CVaR based on CAPM (Panel A) and the Fama-French three-factor model (Panel B).

The sample size decreased to 87 IPOs that disclose ESG scores at the time of listing and for which IPO deal data, stock market price data and financial statement data are available. Higher ESG scores have lower volatility and

Table 6 ESG Scores' Impact on Idiosyncratic Risk

	Panel A: CAPM				
	log (Idiosyncratic volatility)	log ($VaR_{0.95}$)	log ($VaR_{0.90}$)	log ($CVaR_{0.95}$)	log ($CVaR_{0.90}$)
	(1)	(2)	(3)	(4)	(5)
ESG score	− 0.008**	−0.007*	−0.007**	−0.008*	−0.007*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
log (Firm age)	−0.065	−0.063	−0.060	−0.076	−0.071
	(0.058)	(0.053)	(0.052)	(0.055)	(0.054)
Business	0.564***	0.479***	0.459***	0.597***	0.555***
	(0.111)	(0.108)	(0.110)	(0.109)	(0.105)
Health	0.480***	0.493***	0.474***	0.479***	0.483***
	(0.142)	(0.142)	(0.139)	(0.153)	(0.149)
Manufacturing	0.263*	0.283**	0.216*	0.343**	0.302**
	(0.143)	(0.130)	(0.119)	(0.158)	(0.141)
Consumer Durables	0.464***	0.403***	0.386***	0.505***	0.462***
	(0.116)	(0.107)	(0.103)	(0.107)	(0.107)
Wholesale and Retail	0.244*	0.270**	0.244**	0.257**	0.257**
	(0.130)	(0.115)	(0.119)	(0.122)	(0.119)
Telephone and Television	0.943***	0.634***	0.541**	0.830***	0.752***
	(0.239)	(0.238)	(0.229)	(0.177)	(0.201)
Bookrunner reputation	0.003	0.004	0.002	0.003	0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Equity retention	−0.074	−0.042	−0.059	−0.097	−0.076
	(0.087)	(0.083)	(0.081)	(0.088)	(0.084)
Primary shares	0.095	0.116	0.066	0.094	0.094
	(0.100)	(0.097)	(0.097)	(0.099)	(0.097)
log (1 + Use of proceeds)	0.188	0.173	0.149	0.209*	0.186*
	(0.124)	(0.113)	(0.120)	(0.111)	(0.111)
1/Offer size	14.110***	11.892***	12.418***	10.428***	11.248***
	(3.527)	(3.452)	(3.415)	(3.644)	(3.518)
Heat volume	−0.153	−0.080	−0.127	−0.139	−0.130
	(0.137)	(0.139)	(0.143)	(0.143)	(0.139)
Constant	−1.345***	−3.746***	−3.961***	−3.372***	−3.576***
	(0.278)	(0.253)	(0.256)	(0.259)	(0.255)
Observations	87	87	87	87	87
R^2	0.605	0.563	0.543	0.604	0.594
Adjusted R^2	0.528	0.478	0.455	0.527	0.515
	Panel B: Fama-French three-factor asset-pricing model				
	log (Idiosyncratic volatility)	log ($VaR_{0.95}$)	log ($VaR_{0.90}$)	log ($CVaR_{0.95}$)	log ($CVaR_{0.90}$)
	(1)	(2)	(3)	(4)	(5)
ESG score	−0.009**	−0.007**	−0.007*	−0.008**	−0.008**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
log (Firm age)	−0.063	−0.051	−0.075	−0.072	−0.069
	(0.058)	(0.054)	(0.053)	(0.055)	(0.054)
Business	0.573***	0.514***	0.472***	0.606***	0.566***
	(0.113)	(0.110)	(0.108)	(0.110)	(0.107)
Health	0.490***	0.504***	0.464***	0.488***	0.490***

Table 6 (continued)

	Panel B: Fama-French three-factor asset-pricing model				
	log (Idiosyncratic volatility)	log ($VaR_{0.95}$)	log ($VaR_{0.90}$)	log ($CVaR_{0.95}$)	log ($CVaR_{0.90}$)
	(1)	(2)	(3)	(4)	(5)
	(0.143)	(0.146)	(0.142)	(0.152)	(0.149)
Manufacturing	0.249	0.273**	0.194*	0.349**	0.300**
	(0.155)	(0.136)	(0.101)	(0.154)	(0.137)
Consumer Durables	0.467***	0.398***	0.405***	0.504***	0.459***
	(0.109)	(0.105)	(0.099)	(0.095)	(0.095)
Wholesale and Retail	0.248*	0.280**	0.246**	0.280**	0.271**
	(0.133)	(0.122)	(0.116)	(0.121)	(0.119)
Telephone and Television	0.963***	0.610**	0.587***	0.852***	0.774***
	(0.243)	(0.248)	(0.215)	(0.181)	(0.202)
Bookrunner reputation	0.004	0.005	0.003	0.004	0.004
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)
Equity retention	−0.073	−0.041	−0.060	−0.091	−0.076
	(0.089)	(0.088)	(0.083)	(0.087)	(0.086)
Primary shares	0.103	0.091	0.085	0.103	0.098
	(0.100)	(0.098)	(0.093)	(0.099)	(0.097)
log (1 + Use of proceeds)	0.176	0.157	0.113	0.192*	0.173
	(0.125)	(0.115)	(0.117)	(0.111)	(0.112)
1/Offer size	14.410***	12.447***	12.586***	10.878***	11.530***
	(3.584)	(3.494)	(3.546)	(3.595)	(3.534)
Heat volume	−0.163	−0.103	−0.144	−0.149	−0.146
	(0.139)	(0.150)	(0.141)	(0.143)	(0.141)
Constant	−1.357***	−3.762***	−3.911***	−3.384***	−3.587***
	(0.279)	(0.254)	(0.253)	(0.256)	(0.254)
Observations	87	87	87	87	87
R^2	0.603	0.545	0.555	0.607	0.594
Adjusted R^2	0.526	0.456	0.468	0.531	0.515

This table reports the association between ESG scores and idiosyncratic risk for a sample of 87 IPOs from 2002 to 2018. Idiosyncratic risk is the annualised standard deviation of regression residuals from CAPM (Sharpe, 1964; Lintner, 1965; Mossin, 1966) (Panel A) or Fama and French's (1993) three-factor asset-pricing model (Panel B) for the first 252 trading days from the listing date, or up to the delisting date, whichever comes first. Daily stock returns include any delisting returns if applicable. ESG score captures compliance quality. Firm age is the number of years between the founding and listing dates. Industry sector dummy variables capture IPOs' affiliation with the following SIC classifications: business; health; manufacturing; consumer durables; wholesale and retail; and telephone and television transmission. Bookrunner reputation measures the average market share of lead underwriters making up a syndicate commensurate with the listing year. Equity retention denotes Leland and Pyle's (1977) signal of firm quality by firm insiders to outside investors, measured by the proportion of equity retained by pre-IPO owners in the post-flotation firm. The ratio of primary shares to total shares measures the proportion of new money raised. Use of proceeds captures the number of uses of proceeds disclosed in the flotation prospectus. Offer amount is the total proceeds in millions of dollars measured in real dollars at 2002 price levels. Heat number is a zero-one dummy variable, coded one if the number of IPOs in a quarter of the year is 50% greater than the three-month moving average, or else coded zero. More detailed variable definitions and data sources are available from Table 1. Figures in parentheses below the estimated coefficients are heteroskedastic-consistent standard errors. ***, ** and * denote 1%, 5% and 10% significance, respectively

downside tail risk. Therefore, not only does disclosure reduce idiosyncratic risk, but more favourable ESG scores also have lower firm-specific risk, thus confirming H2. Therefore, these findings correspond with the disclosure proposition by Beatty & Ritter (1986) and Beatty & Welch (1996). They are also consistent with studies suggesting that environmental concerns (e.g. Golicic & Smith, 2013), social performance and responsibility (e.g. Miller et al., 2018) and strong governance (e.g. Yeoh, 2016) reduce firm-specific risks and thus diminish volatility in stock prices.

Most industry dummy variables indicate differences in idiosyncratic risk between sectors. These differences are

persistent, regardless of the disclosure or non-disclosure of ESG scores. Therefore, our findings correspond with those of Ritter (1984, 1991), Purnanandam & Swaminathan (2004), and Jeon et al. (2015), who reported differences in the initial return and long-term IPO performance across industry sectors. Offer size retains its statistical significance. Larger offerings have a persistently higher idiosyncratic risk. This result is in contrast to the studies of Beatty & Ritter (1986), Ritter (1987) and Carter (1992) which reported an inverse relationship.

Several explanatory variables had fluctuating statistical significance. When the ESG scores were entered into the estimation, firm age, lead underwriter reputation, equity retention and hot new issue market conditions lost their statistical significance in explaining the variation in idiosyncratic risk. The use of proceeds remained statistically significant but not in most estimation models. Primary shares in relation to the total shares offered did not achieve statistical significance in any of the estimation models. Overall, ESG scores seemed to outweigh the effect from other explanatory variables commonly presented in the literature as indicators of financial risk in the aftermarket trading.

Conclusion

In this study, we chose the revelatory setting of IPOs when firms transition from private to public ownership. This setting allowed us to analyse the ability of ESG data to mitigate information asymmetry in corporate legitimacy and IPO value among market participants in the absence of any prior market trading history. The transition from private to public ownership by obtaining a stock market listing is a unique opportunity to validate the signalling effect (Lai et al., 2016) from investments in ESG performance and the (voluntary) disclosure of related ESG information. The present study makes the following distinct contributions to the research area of ESG and the financial risk literature.

First, we examined the effect of ESG disclosure or non-disclosure at the time of listing on idiosyncratic risk in subsequent aftermarket trading for up to one year, or the date of delisting, whichever comes first. We used idiosyncratic risk to measure the effects of ESG scores and ESG disclosure on corporate financial performance. Finding an inverse relationship between ESG disclosure and idiosyncratic volatility for IPOs enabled us to extend the findings of Beatty & Ritter (1986) and Beatty & Welch (1996), who analysed the effect of voluntary disclosure or non-disclosure of earnings forecasts, the use of proceeds and the risk factors on aftermarket return performance. Simultaneously, we corroborated empirical evidence that (voluntary) ESG disclosure indeed serves the information needs of both investors and society (Eccles et al., 2011), thus helping to increase stock price informativeness (Grewal et al., 2020). In this way, the positive link between ESG disclosure and firm performance, as indicated by various studies (e.g. Platonova et al., 2018), is strengthened further, specifically in terms of risk performance (Orlitzky, 2001).

Despite the ongoing conceptual controversies on how far sustainability disclosure leads to (more) responsible and ethical business conduct (Gold & Heikkurinen, 2018), enhancing transparency in corporate compliance with societal expectations can be assumed to help companies gain legitimacy and thus increase their chances to survive and thrive during an IPO and in the aftermarket.

Second, we investigated the effect of ESG disclosure or non-disclosure at the time of listing, specifically on idiosyncratic downside tail risk. We measured downside risk through VaR and CVaR, while idiosyncratic volatility included both upside and downside tail risk. Investors are more likely to be concerned with downside risk rather than upside risk. By finding a link between ESG disclosure and reduced CVaR and VaR over the first year of trading in the aftermarket, we built on the current literature on idiosyncratic volatility (e.g. Campbell & Taksler, 2003; Moeller et al., 2007). Exclusively focussing on downside tail risk in relation to information asymmetry agrees with the idea of a company's societal license to operate, particularly the risk of losing this license through inappropriate business conduct from the perspective of prevalent societal values and norms (Shinkle & Spencer, 2012). Recent scandals, such as those at Volkswagen and Monsanto, provide reasons to assume that, in terms of sustainability and business ethics, companies have more to lose than to gain. That is, increasing transparency and accountability is, first and foremost, a strategy for companies to maintain legitimacy by preserving their image as valuable members of society.

Third, we selected a subset of matching peer firms that share similar features and that either disclose or do not disclose ESG information. Matching sample estimations were used as robustness checks to help mitigate an imbalance in our observations, which is due to the nature of the data availability and beyond our control. The matching approach used multidimensional propensity scores based on ex-ante sales as a proxy for firm size and ex-post profitability measures, as long as the IPOs had identical industry affiliation and obtained their listings in the same year. We used this matching approach to corroborate the effect of ESG disclosure or non-disclosure on firm-specific risk. Applying multiples of comparable firms is a common practice in IPO valuation, consistent with Kim & Ritter (1999). Although various control variables dipped in and out of statistical significance when explaining the variation in idiosyncratic risk, voluntary ESG disclosure did not lose its statistical significance.

Therefore, we consider ESG disclosure a robust predictor of idiosyncratic risk that could replace some of the more traditional ex-ante measures of uncertainty used in the current IPO literature. Similarly, our analysis suggests that the ESG score could replace some of the more conventional measures for explaining idiosyncratic risk of IPOs, such as firm age at the time of listing, as an ex-ante indicator of risk. This indicates that sustainability and responsible as well as ethical corporate conduct have become strategic predictors and facilitators of business success.

Finally, we found that ESG performance scores negatively affected both idiosyncratic volatility and downside tail risk. This corroborates the legitimacy argument around sustainable business conduct, that is, 'proper' and 'appropriate' business conduct is rewarded by stakeholders and society at large (Suchman, 1995). There has been a debate on how far ESG scores can affect firm performance and stock value development and what kind of sustainability rating agencies use to measure ESG scores in the first place (Drempetic et al., 2020). Early studies have reported that high ESG ratings correspond to above-average future stock returns. More recent evidence suggests that this outperformance has weakened (Borgers et al., 2013; Humphrey & Tan, 2009). The present study validates the idea that ESG disclosure and higher ESG ratings reduce firm-specific risks from IPOs in the aftermarket trading. Private firms face higher information asymmetries and thus have difficulties building trust with investors when they go public (e.g. Cole et al., 2004; Burgstahler et al., 2006). Furthermore, companies are rewarded when they 'walk their talk' of sustainability and ESG performance as they seek stock market listings.

Aside from these contributions to the knowledge base on ESG and financial risk, the results of this study have implications for business ethics and provide practical guidance for managers. In fact, our analysis suggests that managers should devise and establish ESG accounting tools and procedures years before going public to establish a foundation for ethical business conduct. This enables companies to continuously collect reliable, up-to-date information on ESG aspects that can be used for disclosure to stakeholders. This follows the idea of the voluntary disclosure of ethical business conduct, which sensitises external stakeholders to performance aspects that are not reflected directly through financial parameters (e.g. profit) but rather represent the foundation for companies' proactive embeddedness in society, for example to act as a 'corporate citizen' (Matten et al., 2003; Shinkle & Spencer, 2012), or even 'corporate *citoyen*', with civil and political rights and duties (Aßländer & Curbach, 2013). Accounting for Gold & Heikkurinen's (2018, p.329) objection that the 'transparent act does not alone denote that it is ethically sound: it is just a more visible act', we emphasise that disclosure of ESG information alone is not sufficient for integrating ethical business conduct into corporate practices, processes, and culture. This integration could for example be driven by virtuous managers coalescing the dimensions of people, planet and profits through inspired leadership, so to connect virtues and values to the good of all (Flynn, 2008). Ethical sensitivity and ethical decision-making of employees have also been linked to cooperative corporate culture, fostered by systemic organisational approaches such as total quality management (Chen et al., 1997).

Therefore, companies should make strategic and integrated improvements in ESG performance. Instead of merely paying lip service to their contributions to responsible business conduct, they must 'walk their talk' through distinct moral orientation, proactive engagement and by breaking the profit-dominant logic and prioritising the well-being of the planet and society (Joseph et al., 2020). Taken together in terms of voluntary disclosure theory, ESG performance and disclosure help companies build their reputation capital with investors after going public to increase their stock value without excessive volatility and downside risk.

Despite these contributions and managerial implications, our study has some limitations. Our sample included only US IPOs listed between 2002 and 2018 on the NYSE, NASDAQ or AMEX for which daily stock prices for up to one year post-listing or until the delisting date were available. As ESG disclosure in IPOs is a relatively new phenomenon, historic observations are currently available only sporadically, resulting in an imbalanced dataset. We attempted to address this limitation by making pairs from ESG-disclosing and non-ESG-disclosing IPOs based on a similar value of their propensity score. Matching by propensity score created a balanced dataset that enabled a direct comparison of covariates between ESG-disclosing and non-ESG-disclosing IPOs in our dataset. However, a disadvantage of this approach is that some observations may be discarded from the dataset if matching pairs cannot be found. Therefore, some information about the original dataset structure could be lost. Nevertheless, we believe that using both pooled and propensity score-matched datasets, which provide consistent findings, enabled us to generalise our conclusions despite the imbalance in observations between ESG-disclosing and non-ESG-disclosing IPOs in the original dataset. This imbalance in observations is likely to diminish in the future, as richer datasets become available not only in absolute numbers but also in terms of an increasing relative proportion of IPOs disclosing their ESG ratings. Corroborating our findings will then become possible without losing potentially valuable information as a result of an imbalanced dataset structure.

Notes

1. The Internet Appendix for this article is available online from the journal website at https://doi.org/10.1007/s10551-021-04847-8
2. Stock returns exclude the initial return that captures the difference between the offer price and share price in the secondary market.
3. https://www.refinitiv.com/content/dam/marketing/enus/documents/methodology/esg-scores-methodology.pdf

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10551-021-04847-8.

Funding Open Access funding enabled and organized by Projekt DEAL.

Declarations

Conflict of interest Beat Reber, Agnes Gold and Stefan Gold declare that they have no conflict of interest associated with this research.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

References

Adams, C. A. (2004). The ethical, social and environmental reporting-performance portrayal gap. *Accounting, Auditing & Accountability, 17*(5), 731–757.

Artzner, P., Delbaen, F., Eber, J.-M., & Heath, D. (1999). Coherent mea- sures of risk. *Mathematical Finance, 9*(3), 203–228.

Aßl¨ander, Michael, S., & Curbach., J. (2013). The corporation as Citoyen? Towards a new understanding of corporate citizenship. *Journal of Business Ethics, 120*(4), 541–554.

Atilgan, Y., Bali, T. G., Ozgur Demirtas, K., & Doruk Gunaydin, A. (2020). Left-tail momentum: Underreaction to bad news, costly arbitrage and equity returns. *Journal of Financial Economics, 135*(3), 725–753.

Bali, T. G., Ozgur Demirtas, K., & Levy, H. (2009). Is there an intertemporal relation between downside risk and expected returns? *The Journal of Financial and Quantitative Analysts, 44*(4), 883–909.

Baron, D. P. (1982). A model of the demand for investment banking advising and distribution services for new issues. *Journal of Finance, 37*(4), 955–976.

Beatty, R. P., & Ritter, J. R. (1986). Investment banking, reputation, and the under- pricing of initial public offerings. *Journal of Financial Economics, 15*(1–2), 213–232.

Beatty, R. P., & Welch, I. (1996). Issuer expenses and legal liability in initial public offerings. *Journal of Law & Economics, 39*(2), 545–602.

Bhabra, H. S., & Pettway, R. H. (2003). IPO prospectus information and subsequent performance. *Financial Review, 38*(3), 369–397.

Boiral, O. (2013). Sustainability reports as simulacra? A counter-account of A and A+ GRI reports. *Accounting, Auditing & Accountability, 26*(7), 1036–1071.

Borgers, A., Derwall, J., Koedijk, K., & ter Horst, J. (2013). Shareholder relations and stock returns: On errors in investors' expectations and learning. *Journal of Empirical Finance, 22*, 159–175.

Bouslah, K., Kryzanowski, L., & M'Zali, B. (2018). Social performance and firm risk: Impact of the financial crisis. *Journal of Business Ethics, 149*(3), 643–669.

Boyer, B., Mitton, T., & Vorkink, K. (2010). Expected idiosyncratic skewness. *The Review of Financial Studies, 23*(1), 169–202.

Burgstahler, D. C., Hall, L., & Leuz, C. (2006). The importance of reporting incentives: Earnings management in European private and public firms. *Accounting Review, 81*(5), 983–1016.

Campbell, J. Y., & Taksler, G. B. (2003). Equity volatility and corporate bond yields. *Journal of Finance, 58*(6), 2321–2350.

Carter, R. B. (1992). Underwriter reputation and repetitive public offerings. *Journal of Financial Research, 15*(4), 341–354.

Carter, R., & Manaster, S. (1990). Initial public offerings and underwriter reputation. *Journal of Finance, 45*(4), 1045–1067.

Chahine, S., Arthurs, J. D., Filatotchev, I., & Hoskisson, R. E. (2012). The effects of venture capital syndicate diversity on earnings management and performance of IPOs in the US and UK: An institutional perspective. *Journal of Corporate Finance, 18*(1), 179–192.

Chemmanur, T. J., & Krishnan, K. (2012). Heterogeneous beliefs, IPO valuation, and the economic role of the underwriter in IPOs. *Financial Management, 41*(4), 769–811.

Chen, A. Y. S., Sawyers, R. B., & Williams, P. F. (1997). Reinforcing ethical decision making through corporate culture. *Journal of Business Ethics, 16*(8), 855–865.

Cole, R. A., Goldberg, L. G., & White, L. J. (2004). Cookie cutter vs char- acter: The micro structure of small business lending by large and small banks. *Journal of Financial and Quantitative Analysis, 39*(2), 227–251.

Cormier, D., Lapointe-Antunes, P., & McConomy, B. J. (2014). Forecasts in IPO prospectuses: The effect of corporate governance in earnings management. *Journal of Business Finance and Accounting, 41*(1/2), 100–127.

Das, N., João, C., & Vaccaro, A. (2013). Corporate transparency: A perspective from thomas aquinas' summa theologiae. *Journal of Business Ethics, 113*(4), 639–648.

Datta, S., Gruskin, M., & Iskandar-Datta, M. (2015). On post-IPO stock price per- formance: A comparative analysis of RLBOs and IPOs. *Journal of Banking & Finance, 55*, 187–203.

Drempetic, S., Klein, C., & Zwergel, B. (2020). The influence of firm size in the ESG score: Corporate sustainability ratings under review. *Journal of Business Ethics, 167*, 333–360.

Duque-Grisales, E., & Aguilera-Caracuel, J. (2021). Environmental, social and governance (ESG) scores and financial performance of multilatinas: Moderating effects of geographic international diversification and financial slack. *Journal of Business Ethics, 168*, 315–334.

Durnev, A., Morck, R., & Yeung, B. (2004). Value-enhancing capital budgeting and firm-specific stock return variation. *Journal of Finance, 59*(1), 65–105.

Durnev, A., Morck, R., Yeung, B., & Zarowin, P. (2003). Does greater firm- specific return variation mean more or less informed stock pricing? *Journal of Accounting Research, 41*(5), 797–836.

Eccles, R. G., Serafeim, G., & Krzus, M. P. (2011). Market interest in nonfinancial information. *Journal of Applied Corporate Finance, 23*(4), 113–127.

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics, 33*(1), 3–56.

Fama, E. F., & French, K. R. (1997). Industry costs of equity. *Journal of Financial Economics, 43*(2), 153–193.

Fama, E. F. 2020. Data library. https://mba.tuck.dartmouth.edu/pages/faculty/ken.french. Accessed 18 May 2020.

Fink, J., Fink, K. E., Grullon, G., & Weston, J. P. (2010). What drove the increase in idiosyncratic volatility during the internet boom? *Journal of Financial & Quantitative Analysis, 45*(5), 1253–1278.

Florio, C., & Leoni, G. (2017). Enterprise risk management and firm performance: The Italian case. *British Accounting Review, 49*(1), 56–74.

Flynn, G. (2008). The virtuous manager: A vision for leadership in business. *Journal of Business Ethics, 78*(3), 359–372.

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment, 5*(4), 210–233.

Galbreath, J. (2013). ESG in Focus: The Australian Evidence. *Journal of Business Ethics, 118*(3), 529–541.

Giannarakis, G., Andronikidis, A., & Sariannidis, N. (2020). Determinants of environmental disclosure: investigating new and conventional corporate governance characteristics. *Annals of Operations Research, 294*, 87–105.

Gold, S., & Heikkurinen, P. (2018). Transparency fallacy: Unintended consequences of stakeholder claims on responsibility in supply chains. *Accounting, Auditing and Accountability Journal, 31*(1), 318–337.

Golicic, S. L., & Smith, C. D. (2013). A meta-analysis of environmentally sustainable supply chain management practices and firm performance. *Journal of Supply Chain Management, 49*(2), 78–95.

Gray, R. (2010). Is accounting for sustainability actually accounting for sustainability … and how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organizations and Society, 35*(1), 47–62.

Greene, D. (2016). The wealth of private firm owners following reverse mergers. *Journal of Corporate Finance, 37*, 56–75.

Gregory, A., Guermat, C., & Al-Shawawreh, F. (2010). UK IPOs: Long run returns, behavioural timing and pseudo timing. *Journal of Business Finance & Accounting, 37*(5), 612–647.

Grewal, J., Hauptmann, C., & Serafeim, G. (2020). Material sustainability infor- mation and stock price informativeness. *Journal of Business Ethics, Forthcoming*. https://doi.org/10.1007/s10551-020-04451-2

Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production, 59*, 5–21.

Hanley, K. W., & Hoberg, G. (2012). Litigation risk, strategic disclosure and the underpricing of initial public offerings. *Journal of Financial Economics, 103*(2), 235–254.

Hao, (Grace) Qing. (2011). Securities litigation, withdrawal risk and initial public offerings. *Journal of Corporate Finance, 17*(3), 438–456.

Hoepner, A., & Schopohl, L. (2018). On the price of morals in markets: An empirical study of the Swedish AP-Funds and the Norwegian Government Pension Fund. *Journal of Business Ethics, 151*(3), 665–692.

Hossain, M., Islam, M. T., Momin, M. A., Nahar, S., & Alam, M. S. (2019). Understanding communication of sustainability reporting: Application of symbolic convergence theory (SCT). *Journal of Business Ethics, 160*(2), 563–586.

Humphrey, J., & Tan, D. (2009). Does it really hurt to be responsible? *Journal of Business Ethics, 122*(3), 375–386.

Ibikunle, G., & Steffen, T. (2017). European green mutual fund performance: A comparative analysis with their conventional and black peers. *Journal of Business Ethics, 145*(2), 337–355.

Jeon, J. Q., Lee, C., Nasser, T., & Tony Via, M. (2015). Multiple lead underwriter IPOs and firm visibility. *Journal of Corporate Finance, 32*, 128–149.

Joseph, J., Borland, H., Orlitzky, M., & Lindgreen, A. (2020). Seeing versus doing: How businesses manage tensions in pursuit of sustainability. *Journal of Business Ethics, 164*(2), 349–370.

Kaptein, M. (2020). How much you see is how you respond: the curvilinear relationship between the frequency of observed unethical behavior and the whistleblowing intention. *Journal of Business Ethics, Forthcoming*. https://doi.org/10.1007/s10551-020-04663-6

Kim, M., & Ritter, J. R. (1999). Valuing IPOs. *Journal of Financial Economics, 53*(3), 409–437.

Kulik, B. W., O'Fallon, M. J., & Salmath, M. S. (2008). Do competitive environments lead to the rise and spread of unethical behavior? Parallels from Enron. *Journal of Business Ethics, 83*(4), 703–723.

Lai, A., Melloni, G., & Stacchezzini, R. (2016). Corporate sustainable development: Is 'integrated reporting' a legitimation strategy? *Business Strategy and Environment, 25*(3), 165–177.

Leland, H. E., & Pyle, D. H. (1977). Informational asymmetries, financial structure, and financial intermediation. *Journal of Finance, 32*(2), 371–387.

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics & Statistics, 47*(1), 13–37.

Lowry, M., & Shu, S. (2002). Litigation risk and IPO underpricing. *Journal of Financial Economics, 65*(3), 309–335.

Matten, D., Crane, A., & Chapple, W. (2003). Behind the mask: Revealing the true face of corporate citizenship. *Journal of Business Ethics, 45*(1/2), 109–120.

Megginson, W. L., & Weiss, K. A. (1991). Venture capitalist certification initial offerings. *Journal of Finance, 46*(3), 879–903.

Melé, D., Rosanas, J. M., & Fontrodona, J. (2017). Ethics in Finance and Accounting: Editorial Introduction. *Journal of Business Ethics, 140*(4), 609–613.

Miller, S. R., Eden, L., & Li, D. (2018). CSR reputation and firm performance: A dynamic approach. *Journal of Business Ethics, 163*(3), 619–636.

Moeller, S. B., Schlingemann, F. P., & Ren´e, M. S. (2007). How do diversity of opinion and information asymmetry affect acquirer returns? *Review of Financial Studies, 20*(6), 2047–2078.

Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica, 34*(4), 768–783.

Neophytou, E., & Molinero, C. M. (2004). Predicting corporate failure in the UK: A multidimensional scaling approach. *Journal of Business Finance and Accounting, 31*(5–6), 677–710.

Orlitzky, M. (2001). Does firm size confound the relationship between corporate social per- formance and firm financial performance. *Journal of Business Ethics, 33*(2), 167–180.

Orlitzky, M., & Benjamin, J. D. (2016). Corporate social performance and firm risk: A meta-analytic review. *Business & Society, 40*(4), 369–396.

Pastor, L., & Veronesi, P. (2003). Stock valuation and learning about profitability. *Journal of Finance, 58*(5), 1749–1789.

Piotroski, J. D., & Roulstone, D. T. (2004). The influence of analysts, institutional in- vestors, and insiders on the incorporation of market, industry, and firm-specific information into stock prices. *Accounting Review, 79*(4), 1119–1151.

Platonova, E., Asutay, M., Dixon, R., & Mohammad, S. (2018). The impact of corporate social responsibility disclosure on financial performance: Evidence from the GCC Islamic banking sector. *Journal of Business Ethics, 151*(2), 451–471.

Purnanandam, A. K., & Swaminathan, B. (2004). Are IPOs really under- priced? *Review of Financial Studies, 17*(3), 811–848.

Ritter, J. R. (1984). The 'hot issue' market of 1980. *Journal of Business, 57*(2), 215–240.

Ritter, J. (1987). The costs of going public. *Journal of Financial Economics, 19*(2), 269–281.

Ritter, J. R. (1991). The long-run performance of initial public offerings. *Journal of Finance, 46*(1), 3–27.

Ritter, J.R. (2020). IPO data. https://bear.warrington.ufl.edu/ritter. Accessed 1 May 2020.

Rock, K. (1986). Why new issues are underpriced. *Journal of Financial Economics, 15*(1–2), 187–212.

Roll, R. (1988). R^2. *Journal of Finance*, *43*(3): 541–566.

Sajko, M., Boone, C., & Buyl, T. (2021). CEO greed, corporate social responsibility, and organizational resilience to systemic shocks. *Journal of Management, 47*(4), 957–992.

Schoenmaker, D., & Schramade, W. (2019). Investing for long-term value creation. *Journal of Sustainable Finance & Investment, 9*(4), 356–377.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance, 19*(3), 425–442.

Shinkle, G. A., & William Spencer, J. (2012). The social construction of global corporate citizenship: Sustainability reports of automotive corporations. *Journal of World Business, 47*(1), 123–133.

Signori, S., San-Jose, L., Retolaza, J. L., & Rusconi, G. (2021). Stakeholder value creation: Comparing ESG and value added in European Companies. *Sustainability, 13*, 1392.

Sison, A. J., Ignacio Ferrero, G., & Guitián., G. (2019). Characterizing Virtues in Finance. *Journal of Business Ethics, 155*(4), 995–1007.

Stolowy, H., & Paugam, L. (2018). The expansion of non-financial reporting: An exploratory study. *Accounting and Business Research, 48*(5), 525–548.

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review, 20*(3), 571–610.

The Federal Reserve Bank of St. Louis. (2020). U.S. Bureau of Economic Analysis, Gross Domestic Product: Implicit Price Deflator [GDPDEF]. Accessed May 18, 2020. https://fred.stlouisfed.org/series/GDPDEF.

Trinks, P., & Scholtens, B. (2017). The opportunity cost of negative screening in socially responsible investing. *Journal of Business Ethics, 140*(2), 193–208.

Xu, Y., & Malkiel, B. G. (2003). Investigating the behavior of idiosyncratic volatility. *Journal of Business, 76*(4), 613–644.

Yeoh, P. (2016). Corporate governance failures and the road to crime. *Journal of Financial Crime, 23*(1), 216–230.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.