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ESG performance and firm risk in the U.S. financial firms

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Abstract

This study examines the association between the environmental, social, and governance (ESG) performance and firm risk in U.S. financial firms. We find a significant negative association between the composite ESG performance and total, idiosyncratic, and systematic risks after controlling for firm and year fixed effects and other risk predictors. We also examine the effect of each pillar of ESG on this relationship and find that "S" and "G" exhibit a significant negative relationship with both systematic and idiosyncratic risks of firms, while "E" is only associated with systematic risk. Lastly, we demonstrate that ESG performance is negatively associated with the extent to which leverage contributes to firm risk, supporting our premise that ESG alleviates financial risk. Overall, we provide empirical evidence of potential risk management benefits of ESG in the financial industry.

KEYWORDS

ESG rating, financial services industry, firm risk, idiosyncratic risk, risk management, systematic risk

JEL CLASSIFICATION

G32, M14

1 | INTRODUCTION

Financial institutions, such as banks and insurers, are major players in helping to promote the stability and growth of the financial system (Barclift, 2012; Bernal et al., 2014). However, they are also capable of precipitating systemic shocks across the economy when risk management fails, as the 2007–2008 financial crisis highlighted (Bebchuk et al., 2010; Wagner, 2010). The concern over the negative externalities of financial firms' crises on the financial system has led to growing demands for their sustainable and responsible business practices for the overall economic stability. As a result, financial firms have progressively adopted environmental, social, and corporate governance (ESG) principles and made taken unprecedented initiatives to align their business practices with the interests of both shareholders and non-shareholding stakeholders. As of November 2023, 325 banks representing approximately 50% of global banking assets have become signatories of the United Nations (UN) Principles of Responsible Banking, through which member banks pledge to uphold sustainability goals.[1] Similarly, within the insurance industry, 153 signatories have joined the UN Principles of Sustainable Insurance to address ESG risks and opportunities for insurers.[2] Given the convergence of the post-financial crisis era with the growth of ESG practices over the past decade, now is an opportune moment to explore the relationship between ESG and the risk profiles of financial firms.

In this research, we examine how financial firms' ESG ratings are associated with firm risk, aiming to explore the implication of ESG for risk management in the financial sector. The impact of ESG on firm risk has been the subject of numerous studies, including Albuquerque et al. (2019), El Ghoul et al. (2018), Lee and Faff (2009), Luo and Bhattacharya (2009), and Oikonomou et al. (2012). Despite this extensive research, the investigation of this topic in the U.S. financial industry remains unexplored.

Effective management of firm risk is particularly critical for financial firms, as firm risk affects their cost of financing capital. This cost is shaped by both ex-post and perceived firm risk, with analysts and investors using historical data and forward-looking factors to determine the required return on capital. For illustration, firms exhibiting higher market volatility can be perceived by investors and analysts as having higher equity risk, which translates into an increased cost of equity for these firms (Baker & Wurgler, 2013; Belkhir et al., 2019). An elevated cost of equity presents challenge for financial firms, who depend on equity financing to satisfy regulatory capital requirements[3] and build capital buffers in preparation for economic downturns. Conversely, reduced firm risk should decrease the overall funding cost, enabling financial firms to build capital buffers more easily, absorb possible losses in asset values, and fulfill regulatory requirements (Baker & Wurgler, 2013; Belkhir et al., 2019; Shim, 2010). Indeed, effective risk management is vital for maintaining the stability and reliability of their capital financing.

We find that higher ESG performance is associated with lower firm risk, based on a sample of 453 U.S. publicly traded financial firms during the period of 2014–2020. We operationalize firm risk by measuring total volatility, systematic risk (beta), and idiosyncratic volatility based on realized daily stock returns. Specifically, we present a robust negative association between composite ESG ratings and total, systematic, and idiosyncratic risks of financial firms, suggesting ESG's potential risk-mitigation benefits for financial firms. We find that the social (S) and governance (G) pillars are significantly associated with all forms of firm risk, whereas the environmental (E) pillar exhibit association with total risk only through the idiosyncratic component.

Additionally, we consider the role of leverage in the analysis of ESG and firm risk. Financial firms, particularly banks and insurers, typically operate with high leverage, which can escalate their systemic risk (Acharya, 2009; Yang et al., 2021). As a result, financial firms' debt policy has garnered significant political and regulatory scrutiny, particularly in the aftermath of the 2007–2009 global recession. Meanwhile, research in ESG has extended to ESG's impact on credit markets, with studies underscoring the effect of ESG on mitigating leverage—risk (Bae et al., 2019; Bauer et al., 2009; Jo & Na, 2012; Li et al., 2022). Hence, we argue that investigation should extend to examining how ESG interacts with leverage in the context of explaining firm risk. Our findings reveal that ESG diminishes the extent to which leverage contributes to firm risk, which aligns with our premise that ESG helps mitigate financial risk.

2 | LITERATURE REVIEW

As ESG practices become increasingly mainstream across various industries, there has been a profound growth in ESG reports and articles spanning multiple disciplines, including finance, management, accounting, and marketing. In academia, studies have examined ESG in specific countries or in international contexts, and across various industries (Barclift, 2012; Jo & Na, 2012). Previous research has analyzed numerous associations between ESG and firm-specific attributes, such as financial performance (Huang, 2021; Jizi et al., 2016; Jo & Harjoto, 2011), ownership (Li et al., 2016), reputation (Fombrun et al., 2000; Hsu, 2012), industry (Cai et al., 2012), and size (Hou et al., 2016) among others.

While recent studies have explored the empirical relationship between ESG factors and risks within the financial industry, they have centered on European firms or firms on a global scale. Di Tommaso and Thornton (2020) find that European banks' higher ESG scores are associated with lower accounting-based risk. Similarly, Izcan and Bektas (2022) find a negative correlation between ESG and idiosyncratic risk in medium- to high-risk Eurozone banks. In a global banking context, Neitzert and Petras (2022) employed accounting-based risk measures to demonstrate the risk-mitigating effects of CSR activities. Furthermore, Gangi et al. (2019) find that banks from 35 countries that are more sensitive to environmental issues exhibit lower risk, measured by *z*-score, supporting the argument that environmental-friendly firms achieve higher operational efficiency (Clarkson et al., 2011) and improve reputation and loyalty of their customers (Lacey & Kennett-Hensel, 2010). Galletta et al. (2023) find that firms with higher ESG ratings reduce operational risk. These effects translate into lower funding cost and enhanced funding stability for firms (El Ghoul et al., 2011). However, there remains limited empirical evidence regarding the relationship between ESG and firm risk within the U.S. financial sector, despite the importance of U.S. in the global banking and insurance sector.[4] This research specifically focuses on investigating the relationship between ESG performance and firm risk within the U.S. financial services sector.

Studies examining ESG and risks have employed a range of risk measures. These measures include firm-specific market risks based on stock return volatility (He et al., 2022; Izcan & Bektas, 2022; Lee & Faff, 2009; Luo & Bhattacharya, 2009; Sassen et al., 2016), beta coefficients representing systematic risk (Albuquerque et al., 2019; Giese et al., 2019; Oikonomou et al., 2012; Sassen et al., 2016), accounting-based risk measures (Di Tommaso & Thornton, 2020; Gangi et al., 2019; Neitzert & Petras, 2022), and downside risk measures, such as VaR (He et al., 2022; Hoepner et al., 2016; Kim et al., 2014). Orlitzky and Benjamin (2001) conducts a meta-analysis of relevant studies examining the relationship between CSR and a range of risk measures. Their meta-analysis based on 18 studies suggests that higher CSR performance reduces firm risk, more strongly exhibited through market-based risk measures than accounting-based measures. Sassen et al. (2016) employs total, systematic, and idiosyncratic risks measured with historical stock returns in their analysis of ESG-risk association for European firms.

In our research, we operationalize firm risk with stock return-based volatility, focusing specifically on U.S. financial institutions—an area not previously explored in ESG literature. In financial theory, the total stock risk can be decomposed into systematic and idiosyncratic components. Systematic risk arises from broad market or industry uncertainties, whereas idiosyncratic risk is company- or asset-specific. Regulatory and investor attention has mainly centered on monitoring financial institutions' exposure to systematic risk because financial firms' systematic risk exposure to the U.S. subprime market was the core issue during the financial crisis. However, the importance of idiosyncratic volatility cannot be downplayed. While it is generally true that idiosyncratic risk typically affects a single firm and is often considered negligible within a diversified portfolio, financial firms' idiosyncratic risks can be difficult to diversify away because of the documented contagion effects and systemic risk endemic to this sector (Bebchuk et al., 2010; Bessler et al., 2015; Wagner, 2010). An isolated bank failure can trigger cascading bank runs through informational interconnections, inducing panic and potential systemic market disruptions (Acharya & Thakor, 2016; Aghion et al., 2000; Zawadowski, 2013). Thus, efforts to mitigate idiosyncratic risks in the financial sector are pivotal for maintaining financial stability. Following Bhattacharyya and Purnanandam (2011) and Bessler et al. (2015) who emphasize distinguishing systematic and idiosyncratic risks when analyzing market risk of financial firms, we separate total risk into systematic and idiosyncratic components and analyze each component's relationship with ESG ratings.

3 | HYPOTHESES DEVELOPMENT

Existing literature highlights several risk-management benefits associated with ESG, leading us to presume association of ESG activities with lower risk. These ESG benefits encompass providing firms with insurance-like protection, facilitating access to financing, enhancing reputation, and improving relationships with stakeholders among other advantages—all contributing to mitigating firm risk and the likelihood of losses.

Stakeholder theory advocates for a socially responsible approach to business management and urges firms to address the interests of multiple *stakeholders*, encompassing employees, supplies, customers, and communities, not just the interests of shareholders (Hill & Jones, 1992; McWilliams & Siegel, 2001; Preston & Sapienza, 1990). This broad view of corporate responsibility aligns closely with ESG criteria, which assesses a firm's participation in environmental protection (E), social responsibility (S), and good governance (G) for serving the greater good. This alignment between stakeholder theory and ESG criteria allows identifying several theoretical mechanisms through which ESG practices may be associated with lower firm risk.

First, participation in activities that serve the broader society creates a form of goodwill or moral capital that can act as "insurance-like" protection for the firm when negative events occur (Gardberg & Fombrun, 2006; Godfrey et al., 2009). The goodwill or moral capital can come in the form of better reputation, greater customer loyalty, partnership opportunities, and positive brand establishment, which can help firms retain customers and employees, access to opportunities, and competitiveness even in times of crisis (Aramburu & Pescador, 2019; Fombrun et al., 2000; Herremans et al., 1993; Hsu, 2012; Turban & Greening, 1997).

Relatedly, ESG is shown to foster trust between a firm and its diverse stakeholders (Hong & Liskovich, 2015; Lins et al., 2017). Strong ESG practices can lead to high employee loyalty and morale, enabling firms to attract and retain talent while cultivating a positive corporate culture that enhances resilience in challenging circumstances (Bauer et al., 2009; Lins et al., 2017). Lins et al. (2017) demonstrate that CSR firms outperformed others during the financial crisis, attributing the outperformance to the trust established between firms and stakeholders, particularly valuable when the market faces adverse shocks.

Studies have suggested ESG as a conflict-resolution device that reduces conflicts with stakeholders, leading to fewer company-specific adverse events, such as product recalls, labor strikes, and scandals (El Ghoul et al., 2018; Jo & Harjoto, 2011). Adherence to ESG is also associated with regulatory goodwill, which might provide government tax-benefits to survive competition, favorable treatment during challenging times, and lower litigation risk (Waddock & Graves, 1997). Sassen et al. (2016) construct a hypothesis that social responsibility helps build stable relations with various stakeholders, which provide risk-management benefits in times of crisis. They support this hypothesis with evidence that higher ESG score reduces total, systematic, and idiosyncratic equity risks.

Clearly, overall evidence suggests that better relations with employee, community, and regulatory bodies help firms to navigate operational or financial hurdles with a greater ease. These expectations and perceptions of ESG's risk-management benefits can attract investors, improve firms' access to financing, and lower cost of capital, which lessens vulnerability to market downturns (Cao et al., 2015; El Ghoul et al., 2011; Hong & Kacperczyk, 2009). Cao et al. (2015) find that companies with better reputation enjoy a lower cost of equity financing; and El Ghoul et al. (2011) report that improved employee relations, environmental policies, and product strategies reduce firms' cost of equity. An area in ESG research has advocated ESG as a means to improve management practice that reduces firm's operational risk (Gelb & Strawser, 2001; Kim et al., 2012, 2014). For instance, Kim et al. (2014) find the effect of CSR on mitigating stock price crash risk, supporting the role of CSR in enhancing management transparency and reducing managers' bad news hoarding behavior.

Lastly, studies have viewed CSR and ESG as a strategic investment to maintain or increase profit and firm value (McWilliams & Siegel, 2001). In this framework, ESG is viewed as a product differentiation strategy that enables firms to sell more products or sell them at higher prices (Albuquerque et al., 2019; Luo & Bhattacharya, 2009), which would lead to less volatile cashflows, stabilized profitability, and reduced business risk (Bae et al., 2019; Herremans et al., 1993; Hong & Kacperczyk, 2009). Supporting ESG as a business strategy assumes that stakeholders perceive ESG firms or ESG products positively, which can help firms retain their consumers and talent during difficult times.

While theory and evidence are ample in supporting the negative relationship between ESG and firm risk, the agency-conflict theory offers an opposing view, predicting a positive relationship. In imperfect markets, managers can make certain decisions to pursue self-serving interests at the expense of shareholders, deviating from the shareholder profit-maximization goal. In this context, managers may adopt ESG practices as a means to build empires, enhance managers' own reputation, bolster their position within the firm, and/or prevent takeover attempts (Barnea & Rubin, 2010; Cespa & Cestone, 2007; Jensen & Meckling, 1976; Jiraporn & Chintrakarn, 2013, p. 203; Surroca & Tribó, 2008). Studies in line with this theory would predict a positive relationship between ESG and firm risk, describing ESG as *over*investments exposing firms to higher market uncertainty and risk (Bouslah et al., 2013; Utz, 2018). Barnea and Rubin (2010) argue that managers who pursue CSR for private goals tend to overinvest in CSR and destroy firm value. Excessive expenditures beyond the optimal level can ultimately lead to losses and increased firm risk for shareholders. Cespa and Cestone (2007) and Surroca and Tribó (2008) show evidence of CSR being utilized as a means of managerial entrenchment to bolster their position within the company by colluding with certain stakeholders at the expense of shareholders. Such strategic decision can be used to reduce the risk of takeover, even if takeover would be beneficial for shareholders, or to resist changes or innovations that could improve company's performance but would threaten their control or reveal past mismanagement (Shleifer & Vishny, 1989). Relatedly, ESG has been identified as a means for managers to indulge in earnings management or window-dressing of financial reports (Friedman, 1970; Hemingway & Maclagan, 2004; Petrovits, 2006; Prior et al., 2008). Such unethical practices such as earnings management are associated with increased likelihood of future risk and potential stock price crashes (Cohen et al., 2014; Francis et al., 2016; Hutton et al., 2009). Hence, the agency-conflict, managerial opportunism, and window-dressing theories lead to the alternative hypothesis.

H10. ESG ratings are negatively associated with firms' total/systematic/idiosyncratic risk.

H1A. ESG ratings are positively (or insignificantly) associated with firms' total/systematic/idiosyncratic risk.

Leverage risk is a pressing concern within the financial sector, especially for regulators, for at least two reasons. First, financial firms often operate with high leverage. Second, high leverage increases the likelihood of financial firms' crises, which can trigger widespread market disruptions due to their role as financial intermediaries (Acharya & Thakor, 2016; Kalemli-Ozcan et al., 2012; Wagner, 2010). Recognizing the importance of leverage in the realm of financial institutions, we examine the interaction effect between ESG and leverage on firm risk.

First, Modigliani and Miller (1958) help us to establish the relationship between leverage and equity risk. In the MM's theoretical framework, total equity risk can be decomposed into business risk and financial risk,[5] where financial risk is the risk arising from debt financing. Here, the MM theory provides an inevitable relationship between leverage and firm risk: leverage increases financial risk and therefore equity risk. Empirically, Baker and Wurgler (2013) and Belkhir et al. (2019) find a positive association between leverage and equity risk in banks, validating the MM theoretical proposition with data. They share an argument, consistently with the MM theorem, that better capitalized financial firms have lower equity risk.

Meanwhile, studies are increasingly documenting risk mitigation benefits of ESG in the credit market. Orlitzky and Benjamin (2001)'s meta-analysis of 18 studies concludes that higher CSR leads to lower financial risk of firms. Bae et al. (2019) find that CSR reduces costs associated with high leverage by committing firms to establish strong relationships with their stakeholders. In their exposition, highly levered firms are more likely to experience substantial losses due to adverse actions by customers and competitors during times of distress, but CSR activities can protect highly levered firms from customer loss and competitors' attack, thereby reducing implicit costs of debt. Relatedly, Bauer et al. (2009) find that firms with better employment practices and policies enjoy lower cost of debt financing, lower credit risk, and lower firm-specific risks. Similarly, Jiraporn and Chintrakarn (2013) find that socially responsible firms enjoy favorable credit ratings; and Li et al. (2022) find that higher ESG ratings mitigate firms' default risk.

Given the MM theoretical proposition about leverage and equity risk and the evidence documenting that ESG mitigates leverage risk, we test how ESG interacts with firm leverage in explaining financial firms' total/systematic/idiosyncratic stock risk. If ESG effectively alleviates financial risk, we expect that leveraged firms will experience reduced equity risk through ESG engagement, considering that financial risk is a key determinant of total equity risk. In Figure 1, we illustrate the interaction effect of ESG in the leverage-risk relationship and construct the following hypothesis.

> **H2.** ESG performance is negatively associated with the extent to which leverage contributes to firm risk.

4 | DATA, METHODOLOGY, AND SUMMARY STATISTICS

Our sample includes all U.S. banks, insurers, and other financial institutions with SIC industry codes 6000-6799 in the period 2014–2020. We extract annual firm financial data from Research Insight, stock returns data from CRSP, and ESG performance data from Sustainalytics. Sustainalytics, a Morningstar Company, stands as a prominent independent research firm specializing in ESG assessments since 2009, covering a vast database of over 11,000 companies globally (Fabozzi et al., 2021). Their ESG ratings evaluate approximately 80 indicators for each company across the environmental, social, and governance domains. Using a balanced scorecard system, the composite score ranging from zero (lowest) to 100 (highest) is computed as the weighted sum of the scores for the three ESG pillars. Scholars have increasingly utilized Sustainalytics and endorsed its use for gauging corporate responsibility performance (Surroca et al., 2010). Our final dataset contains 3360 firm-year observations, all of which meet the data availability requirement of having composite ESG ratings and firm variables used in the analysis. Table 1 exhibits the sample distribution of firms classified by the 4-digit SIC codes.

We estimate the following panel regression including firm and year fixed effects.

$$\begin{aligned}\text{FirmRisk}\,(\text{TVOL},\beta,\text{IVOL})_{i,t} = {} & \gamma_i+\gamma_1\text{ESG}_{i,t}+\gamma_2\text{Size}_{i,t}+\gamma_3\text{ROA}_{i,t}+\gamma_4\text{STDROA}_{i,t}+\gamma_5\text{LEVERAGE}_{i,t}\\ & +\gamma_6\text{MEBE}_{i,t}+\gamma_7\text{LIQUIDITY}_{i,t}+\gamma_8\text{DIVIDEND}_{i,t}+\gamma_9\text{OWNERSHIP}_{i,t}+\sum_t\gamma_{10,t}\text{Year}_{i,t}+\epsilon_{it}\end{aligned} \quad (1)$$

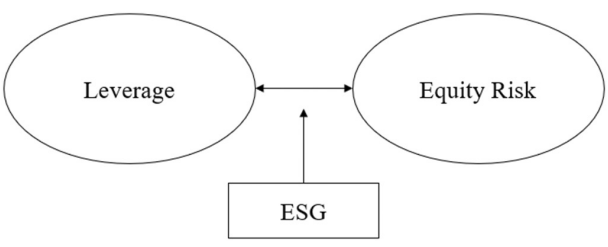

FIGURE 1 Leverage, ESG, and equity risk.

TABLE 1 Sample distribution by SIC classification.

	SIC 4-digits	No. Obs	% Obs
Depository institutions	6000-6099	1176	35
Non-depository institutions	6100-6199	182	5.4
Security and commodity brokers	6200-6299	336	10
Insurance carriers	6300-6399	462	13.8
Insurance agents and brokers	6400-6499	56	1.7
Real estate	6500-6599	119	3.5
Holding and other investment offices	6700-6799	1029	30.6
Total		3360	100

Note: The number and percentage of firm-year observations by subsector sectors of the banking and financial services industry.

The dependent variable is the measure of firm risk. We construct total, idiosyncratic, and systematic risk measures using daily stock returns from the CRSP.

(i) Total Risk (TVOL_i): Total annualized risk for firm i is calculated as the annualized standard deviation of daily returns (R_{it}) over a one-year period aligned with the timing of the ESG ratings, $\text{TVOL}_i = \sqrt{252} * \text{std}(R_{it})$.

(ii) Systematic Risk (β_i): We construct the systematic risk measures by regressing daily excess stock returns on daily excess returns on a broad value-weighted market index spanning a year (Sassen et al., 2016). Then, the factor loading on the market excess returns, β_i, represents the firm's market exposure in the following regression model: $R_{it} - r_{ft} = \alpha_i + \beta_i(R_{Mt} - r_{ft}) + \varepsilon_{it}$, where r_{ft} and R_{Mt} denote the daily risk-free and market returns, respectively.

(iii) Idiosyncratic Risk (IVOL_i): We first calculate the annualized standard deviation of residuals from regressing daily excess stock returns on the daily Carhart four-factor model on an annual basis (Ang et al., 2006; Carhart, 1997; Gao et al., 2022; Lee & Faff, 2009; Sassen et al., 2016): $R_{it} - r_{ft} = \alpha_i + \beta_{Mi}(R_{Mt} - r_{ft}) + \beta_{Si}(\text{SMB}_t) + \beta_{Hi}(\text{HML}_t) + \beta_{UMD}(\text{UMD}_t) + \varepsilon_{it}$. Then, we annualize the standard deviation as follows: $\text{IVOL}_i = \sqrt{252} * \text{std}(\varepsilon_{it})$. For idiosyncratic volatility, a stock must have at least 3 months of daily return observations within the year.

In Equation (1), γ_i controls for all time-invariant firm heterogeneity that might be correlated with the error term ε_{it}, addressing the omitted variable bias problem. The control variables are constructed using annual firm fundamental data from Compustat. Following Sassen et al. (2016), we keep the control variables for total, systematic, and idiosyncratic risk measures the same. We largely follow Oikonomou et al. (2012) and Sassen et al. (2016) in selecting the control variables. Firm size (SIZE, natural log of market equity in USD) has been documented to be inversely related to total and idiosyncratic risk (Malkiel & Xu, 1997; Xu & Malkiel, 2004). Another variable is firm profitability, measured by the return on assets (ROA, pretax-income divided by total assets). Because uncertainty in firm profitability contributes to market volatility, we include the standard deviation of ROA (STDROA) over the previous 5 years (Luo & Bhattacharya, 2009). Other variables include leverage (long-term debt to total assets), market-to-book ratio (MEBE, market value of equity to book value of equity), liquidity (LIQ, total number of shares traded over the year divided by the number of shares outstanding at the company's year-end), and dividend payments (DIV, ratio of common dividends to market value of equity). CEO equity ownership is included in the regression to address the observation that CEOs holding a significant amount of equity in their own firm may be more inclined to take on riskier strategies or investments in pursuit of higher returns as their personal wealth is tied to the firm's performance (Jensen & Meckling, 1976; Wright et al., 1996). This variable is measured as the proportion of the company's stocks and stock options owned by its CEO. Table 2 presents the summary statistics of the variables.

In Table 3, we provide the correlation matrix for the variables employed in the study. As expected, ESG is negatively correlated with total, systematic, and idiosyncratic risk, all at the 5% significance level. Leverage exhibits a positive correlation with all forms of equity risk at the 5% level, as well. It is also noteworthy that ESG ratings positively correlate with leverage, suggesting that firms with stronger ESG performance tend to operate with higher leverage. This aligns with the view that ESG engagement makes leverage more affordable and less risky due to ESG's risk-mitigation benefits.

TABLE 2 Descriptive statistics.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
TVOL	3311	0.264	0.171	0.083	3.174
IVOL	3311	0.230	0.149	0.072	2.846
BETA	3311	1.026	0.425	−0.399	5.467
ESG	2980	39.266	14.822	13.655	86.388
SIZE	3097	7.863	1.526	2.172	12.971
ROA	3087	0.024	0.049	−0.545	0.520
STDROA	3083	0.014	0.029	0.000	0.537
LEVERAGE	3097	0.197	0.220	0.000	1.381
MKEBKE	3083	2.237	2.998	0.116	62.893
LIQUIDITY	3083	1.598	1.429	0.001	37.469
DIVIDEND	3076	0.051	0.051	0.000	0.865
OWNERSHIP	3360	0.010	0.027	0.000	0.285
ESG × LEVERAGE	2727	8.127	9.868	0.000	60.291

Note: The summary statistics (the mean, standard deviation, minimum, and maximum) for the variables used in the study during 2014–2020.

TABLE 3 Pairwise correlation matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) TVOL	1											
(2) IVOL	0.87*	1										
(3) BETA	0.38*	0.30*	1									
(4) ESG	−0.07*	−0.08*	−0.07*	1								
(5) OWNERSHIP	0.09*	0.11*	0.07*	0.16*	1							
(6) FSIZE	−0.25*	−0.28*	0.25*	0.68*	−0.17*	1						
(7) ROA	−0.18*	−0.14*	−0.08*	0.09*	0.15*	0.18*	1					
(8) STDROA	0.03	0.02	0.02	0.05*	0.11*	−0.14*	0.02	1				
(9) LEVERAGE	0.12*	0.20*	0.20*	0.13*	−0.06*	0.10*	0.03	0.12*	1			
(10) MKEBKE	−0.07*	−0.08*	−0.07*	0.13*	0.14*	0.23*	0.45*	0.14*	0.18*	1		
(11) LIQUIDITY	0.33*	0.35*	0.15*	0.13*	0	0.09*	0	0.14*	0.24*	0	1	
(12) DIVIDEND	−0.08*	−0.04*	−0.07*	0.05*	0.13*	0	0.07*	0.03	0.12*	−0.09*	0.26*	1

Note: The correlation matrix of the variables used in the study.

*Shows statistical significance at the 5% level.

5 | RESULTS AND DISCUSSION

5.1 | Relationship between ESG and total/idiosyncratic/systematic risks

We report the regression results from testing our first hypothesis (H1) in this section. Table 4 presents the estimates for the degree to which ESG ratings are associated with total/systematic/idiosyncratic risks. ESG ratings exhibit a statistically and economically significant negative relationship with all forms of firm risk among U.S. financial firms, controlling for other variables. A one-unit increase in standard deviation in ESG corresponds to 1.186%, 1.334%, and 0.296 decreases in total volatility, idiosyncratic volatility, and beta, respectively. Hence, our results are in line with $H1_0$ but clearly rejects the alternative hypothesis ($H1_A$). A negative association between ESG and firm risk is consistent with the hypothesis that ESG provides risk-management benefits including improved relations with stakeholders, enhanced corporate brand and image, conflict resolution, and product differentiation strategy. Our finding is aligned with other empirical studies that also report a negative relationship. Albuquerque et al. (2019), using a panel of U.S. firms across all industries, find that higher CSR performance decreases systematic risk measured by CAPM beta, supporting CSR as a product differentiation

TABLE 4 Panel regressions of total, idiosyncratic, and systematic risk on ESG ratings.

	TVOL	IVOL	BETA
ESG	−0.0008***	−0.0009***	−0.002***
	(0.000)	(0.000)	(0.001)
MKEBKE	−0.0026	−0.0015	−0.0025
	(0.002)	(0.001)	(0.002)
FSIZE	−0.0201**	−0.0229**	0.0720***
	(0.008)	(0.011)	(0.026)
ROA	−0.4625***	−0.4910**	−0.4682**
	(0.196)	(0.186)	(0.198)
STDROA	0.3542	0.3235	0.3342
	(0.285)	(0.296)	(0.295)
LEVERAGE	0.3130***	0.2892***	0.2384**
	(0.118)	(0.109)	(0.090)
LIQUIDITY	0.0334***	0.0275***	0.0372**
	(0.013)	(0.011)	(0.014)
DIVIDEND	−0.1210	−0.0941	−0.0840*
	(0.083)	(0.070)	(0.023)
OWNERSHIP	0.6023***	0.5678	0.5458**
	(0.187)	(0.101)	(0.206)
Constant	0.2632**	0.2451	0.3124***
	(0.098)	(0.094)	(0.087)
Observations	2725	2725	2725
No. of Firms	453	453	453
Adj. R^2	.3176	.3195	.3278
$F(9,452)$	3.94***	4.07***	5.54***
Firm FE	YES	YES	YES
Year FE	YES	YES	YES

Note: The results of the pooled OLS regression of the annualized total (TVOL), idiosyncratic (IVOL), and systematic (BETA) risks on contemporaneous ESG ratings and firm variables, including the market-to-book-equity ratio, logged firm size, stock returns, return on assets (ROA), leverage (debt-to-asset ratio), standard deviation of ROA (STDROA), liquidity, dividend payout ratio, and CEO equity ownership during the 2014–2020 period. The regression includes the year and firm fixed effects, and standard errors are clustered by year.

***$p < .01$; **$p < .05$; *$p < .1$.

strategy that improves profit margins. Additionally, Lee and Faff (2009) and Luo and Bhattacharya (2009) find that higher CSR performance is associated with lower idiosyncratic volatility. Luo and Bhattacharya argue that higher CSR performance lowers idiosyncratic risk by improving customer loyalty and pricing power for firms. However, our findings present a contrast to Oikonomou et al. (2012) and Sassen et al. (2016) who report no significant relationship between ESG and systematic risk in their study of the S&P 500 companies and the European companies of all industries, respectively. The discrepancy in results could be attributed to the specific influence of the financial sector's ESG activities on the broader market.

Bouslah et al. (2013) contend that different dimensions of CSR have varying impacts on firm risk. They find that for non-S&P 500 firms, firm risk is negatively (positively) affected by environmental strength (employee concerns and diversity). To uncover such variation across the individual ESG dimensions, we associate each ESG pillar with total, idiosyncratic, and systematic risk and report the results in Table 5. Table 5 shows that S and G exhibit significantly negative associations with total, idiosyncratic, and systematic risk, whereas E is only significantly associated with systematic risk.

Several factors can explain why firms with higher social and governance ratings exhibit lower systematic and idiosyncratic risk. Companies with strong "social" credentials are forerunners in various areas encompassing employee relations and diversity, community engagement, customer satisfaction, human rights, and social impact. Commitment to these

TABLE 5 Panel regressions of total, idiosyncratic, and systematic risk on each pillar of ESG ratings.

Variables	TVOL	TVOL	TVOL	IVOL	IVOL	IVOL	BETA	BETA	BETA
ENV	−0.00045			−0.00049			−0.0028***		
	(0.000)			(0.000)			(0.001)		
SOC		−0.0014***			−0.001***			−0.0033***	
		(0.000)			(0.000)			(0.001)	
GOV			−0.00097**			−0.0007**			−0.0022***
			(0.000)			(0.000)			(0.001)
MKEBKE	−0.0101*	−0.0102*	−0.0102*	−0.0068**	−0.0068**	−0.00684**	−0.00548	−0.00556	−0.00557
	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)
FSIZE	0.00143	0.00151	0.00168	0.000678	0.000673	0.000789	0.000475	−7.24E-05	0.000238
	(0.026)	(0.025)	(0.025)	(0.021)	(0.020)	(0.021)	(0.035)	(0.034)	(0.035)
ROAA	−1.260***	−1.249***	−1.249***	−0.961***	−0.954***	−0.954***	−1.494***	−1.480***	−1.481***
	(0.343)	(0.344)	(0.344)	(0.285)	(0.286)	(0.286)	(0.379)	(0.376)	(0.376)
STDROA	1.295	1.319	1.327	1.037	1.05	1.055	0.767	0.773	0.784
	(0.801)	(0.803)	(0.806)	(0.680)	(0.681)	(0.682)	(0.933)	(0.925)	(0.931)
DEBTLEV	0.677***	0.687***	0.685***	0.599***	0.606***	0.604***	0.368	0.381	0.373
	(0.200)	(0.198)	(0.199)	(0.177)	(0.176)	(0.176)	(0.255)	(0.254)	(0.255)
LIQUIDITY	0.0334**	0.0330**	0.0333**	0.0268**	0.0265**	0.0267**	0.0381*	0.0376*	0.0382*
	(0.015)	(0.015)	(0.015)	(0.013)	(0.012)	(0.012)	(0.020)	(0.019)	(0.020)
DIVIDEND	0.0324	0.02	0.0255	−0.0136	−0.0241	−0.0198	−0.685***	−0.727***	−0.713***
	(0.152)	(0.153)	(0.151)	(0.115)	(0.115)	(0.114)	(0.185)	(0.188)	(0.191)
OWNERSHIP	1.630**	1.554**	1.592**	1.280**	1.231**	1.261**	1.047	0.951	1.056
	(0.750)	(0.744)	(0.748)	(0.575)	(0.571)	(0.576)	(1.298)	(1.296)	(1.298)
Constant	0.11	0.144	0.129	0.0943	0.116	0.104	1.076***	1.114***	1.071***
	(0.228)	(0.229)	(0.228)	(0.189)	(0.189)	(0.189)	(0.311)	(0.309)	(0.311)
Observations	1672	1672	1672	1672	1672	1672	1672	1672	1672
R^2	.216	.22	.218	.238	.242	.243	.2077	.2081	.2076
No. Firms	460	460	460	460	460	460	460	460	460
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Note: The results of the pooled OLS regression of the annualized total (TVOL), idiosyncratic (IVOL), and systematic (BETA) risks on each pillar of ESG ratings and firm variables, including the market-to-book-equity ratio, logged firm size, stock returns, return on assets (ROA), leverage (debt-to-asset ratio), standard deviation of ROA (STDROA), liquidity, dividend payout ratio, and CEO equity ownership during the 2014–2020 period. The regression includes the year and firm fixed effects, and standard errors are clustered by year.

***$p < .01$; **$p < .05$; *$p < .1$.

social aspects reflects a firm's tangible and perceived contributions to the wider community, which helps firms in forging strong relationships with stakeholders, a positive reputation, and a more stable customer and employee base. This dynamic aligns well with the moral capital and goodwill theory in which ESG acts as a form of insurance-like protection in times of distress (Gardberg & Fombrun, 2006; Godfrey et al., 2009). Strong performance in governance may reflect balanced board composition and structure for effective management, transparent financial reporting process, shareholder rights protection, compliance and risk management process, and management transparency, all of which can reduce operational and financial risk. (Gelb & Strawser, 2001; Kim et al., 2012).

We find a significant negative association between environmental performance "E" and firm risk, primarily through systematic risk. This result aligns with an explanation that addressing environmental concerns and promoting sustainability practices can lower financial firms' exposure to the systematic impacts of environmental issues on the market. More recently, the influence of environmental news and regulations has assumed a more systematic character, affecting countless firms across countries, especially those operating in environmentally sensitive industries (Bolton & Kacperczyk, 2020). For example, academic research has identified climate change as a systematic source of risk that affects the whole economy (Antoniuk & Leirvik, 2021).

Even within the financial industry, the environmental risk can be substantial, particularly if they derive a significant portion of their revenue from extending capital to environmentally sensitive firms (Gangi et al., 2019). In a media coverage in November 2023, the European Central Bank issued a warning to finance executives, cautioning possible regulatory consequences for the industry's failure to manage climate and environmental risks.[6] Such environmental news has a propensity to alter perceptions and behaviors of investors and consumers, leading to widespread actions impacting many firms simultaneously, not restricted to individual firms (Lee et al., 2015). For firms that adhere to environmentally sustainable practices, the sudden emergence of environmental regulatory risks may be mitigated, positioning them to navigate challenges with a greater ease.

Our finding aligns with those of previous studies reporting that "green" stocks exhibit lower risk than less environmental-friendly stocks in various contexts. For instance, Hoepner et al. (2016) find that engagement in climate change efforts mitigates downside risk; and Gangi et al. (2019) find that banks with a stronger environmental commitment exhibit less risk, based on 142 banks from 35 countries. Our findings differ from those of Sassen et al. (2016)'s study based on European firms of all industries. Sassen et al. find that only the social performance (S) has a significantly negative association with all forms of risk measures. The governance performance (G) shows no significant association with firm risk, while the environmental performance (E) decreases systematic risk only in environmentally sensitive industries.[7] Although the findings are not directly comparable to ours due to differences in geographical contexts and industry sectors, the difference in results underscores the importance of considering regional and sector-specific dynamics when analyzing the impact of ESG on firm risk.

5.2 | The interaction effect between ESG and leverage on firm risk

In the Modigliani and Miller (1958) framework, total equity risk can be decomposed into business risk and financial risk. Our focus in this section is the financial risk—the risk arising from using debt financing. Studies including Orlitzky and Benjamin (2001), Bae et al. (2019), and Li et al. (2022) show that ESG practices can reduce the costs of high leverage. Based on these findings, we test our second hypothesis (H2) that ESG is associated with lower equity risk through the mitigation of financial risk. If ESG effectively alleviates financial risk, we expect that leveraged firms will face reduced equity risk through ESG practices, considering that financial risk is a key determinant of total equity risk. To that end, we analyze the interaction effect between ESG and leverage in relation to firm risk.

In our main regression analysis (Equation 1), we introduce the interaction variable $ESG \times Leverage$ and perform fixed-effects regressions of total/systematic/idiosyncratic risks on ESG, Leverage, $ESG \times Leverage$ and other control variables. The results in Table 6 reveal a significantly positive coefficient on *Leverage* and negative coefficient on $ESG \times Leverage$. This combination implies that while higher leverage is associated with higher equity risk through increased financial risk, this link is mitigated in firms with higher ESG ratings. This outcome supports the risk-reduction role of ESG for firms facing higher financial risk and aligns with an explanation that ESG serves as a form of insurance-like protection for leveraged firms (Bae et al., 2019; Bauer et al., 2009). These results should be encouraging for managers of highly levered firms, indicating that initiating or increasing ESG practices could counteract their credit risks (Orlitzky & Benjamin, 2001).

An alternative interpretation of the interaction effect emerges when we shift our focus to significantly negative coefficients on both *ESG* and on $ESG \times Leverage$. This observation focuses on the effect of leverage on the negative relationship between ESG and firm risk (as opposed to the effect of ESG on the positive relationship between leverage and firm risk). Under this perspective, higher leverage intensifies the negative relationship between ESG and firm risk, implying that firms with higher leverage stand to benefit more from ESG's risk-mitigating effect. In fact, this interpretation also aligns with the idea that ESG alleviates financial risk. If ESG diminishes the risk associated with leverage, then firms with higher leverage could derive greater risk-reduction benefits from ESG, empirically exhibiting a stronger negative association between ESG and firm risk.

6 | ROBUSTNESS

6.1 | Robustness to endogeneity bias due to reverse causality

We have interpreted that our contemporaneous regression results as indicating that ESG practices reduce firm risk. However, there exists the possibility of reverse causality or simultaneity, which raises an endogeneity problem that

TABLE 6 The interaction effect of ESG and leverage.

Variables	TVOL (Total risk)	IVOL (Idiosyncratic risk)	BETA (Systematic risk)
ESG	−0.0005*	−0.0007*	−0.0006**
	(0.000)	(0.000)	(0.001)
LEVERAGE	0.1865**	0.1906**	0.1954**
	(0.071)	(0.072)	(0.074)
ESG × LEVERAGE	−0.0103***	−0.0042***	−0.0138***
	(0.002)	(0.002)	(0.004)
MEBE	−0.0028	−0.0018	0.0017
	(0.002)	(0.001)	(0.004)
SIZE	−0.0199*	−0.0219**	0.0223**
	(0.008)	(0.007)	(0.008)
ROA	−0.2892**	−0.2544**	−0.2461**
	(0.109)	(0.096)	(0.094)
STDROA	0.3015*	0.3125*	0.2657
	(0.116)	(0.118)	(0.189)
LIQUIDITY	0.0334***	0.0276***	0.0265**
	(0.013)	(0.011)	(0.010)
DIVIDEND	−0.1230	−0.0956	−0.1595**
	(0.062)	(0.057)	(0.060)
OWNERSHIP	0.7342***	0.6753***	0.5237**
	(0.277)	(0.262)	(0.202)
Constant	0.29**	0.2663**	0.2869**
	(0.107)	(0.094)	(0.108)
Observations	2713	2713	2713
Number of firms	442	442	442
R^2	.3173	.3811	.3685
$F(10,441)$	3.69***	3.76***	5.34***
FIRM FE	YES	YES	YES
YEAR FE	YES	YES	YES

Note: The results of the pooled OLS regression of the annualized total (TVOL), idiosyncratic (IVOL), and systematic (BETA) risks on contemporaneous ESG ratings, an interaction term of ESG and leverage, and firm variables, including the market-to-book-equity ratio, logged firm size, stock returns, return on assets (ROA), leverage (debt-to-asset ratio), standard deviation of ROA (STDROA), liquidity, dividend payout ratio, and CEO equity ownership during the 2014–2020 period. The regression includes the year and firm fixed effects, and standard errors are clustered by year.

***$p < .01$; **$p < .05$; *$p < .1$.

could affect the estimation results. It is plausible that riskier firms might choose to pursue ESG practices to benefit from improved risk management, reputation enhancement, and regulatory compliance. To address this endogeneity concern stemming from potential reverse causality between risk measures and ESG, we employ a panel vector autoregression (VAR) Granger-causality test to ascertain the direction of the relationship between ESG and the risk. In our approach closely following Sassen et al. (2016),[8] we set up the following VAR specifications:

$$\text{FirmRisk}_{i,t} = \alpha_1 + \beta_{1,1}\text{FirmRisk}_{i,t-1} + \beta_{1,2}\text{FirmRisk}_{i,t-2} + \delta_{1,1}\text{ESG}_{i,t-1} + \delta_{1,2}\text{ESG}_{i,t-2} + \text{Controls}_{i,t} + \varepsilon_{i,t}$$

$$\text{ESG}_{i,t} = \alpha_2 + \beta_{2,1}\text{FirmRisk}_{i,t-1} + \beta_{2,2}\text{FirmRisk}_{i,t-2} + \delta_{2,1}\text{ESG}_{i,t-1} + \delta_{2,2}\text{ESG}_{i,t-2} + \text{Controls}_{i,t} + \varepsilon_{i,t}$$

After estimating the VAR model using the generalized method of moments (GMM), we perform Granger causality Wald tests for each equation. In the first equation, we test the null hypothesis defined as H_0: $\delta_{1,1} = \delta_{1,2} = 0$ (i.e., ESG does

not cause FirmRisk). In the second equation, we test the null hypothesis defined as $H_0: \beta_{2,1} = \beta_{2,2} = 0$ (i.e. FirmRisk does not cause ESG).

The results in Table 7 show that the negative association between all forms of volatilities and ESG is not driven by risk causing lower ESG. For total and idiosyncratic volatilities, we find that it is ESG that Granger-causes lower risk. For beta, it is shown that lagged beta does not cause ESG, so the association between beta and ESG is largely contemporaneous. Based on the Granger-causality analysis, we conclude that it is ESG performance that most likely precedes total risk, mitigating the concern of reverse causality.

6.2 | Robustness to an alternative risk measure

In the previous analysis, we measured the market-based bank risks using stock return data. However, we recognize that accounting-based insolvency risk measures are also widely used in the banking literature. For robustness, we construct the z-score, built on work by Boyd et al. (1993) and Boyd and Graham (1986). It can be computed using publicly available accounting data and can complement analysis using market-based approaches. We construct z-score as follows: $z = \frac{\text{ROA} + \text{EA}}{\text{std(ROA)}}$, where ROA = the return on assets, EA = the average of book equity to total assets over the past 5 years, and std(ROA) = standard deviation of annual ROAs over the past 5 years. The lower z-score indicates higher risk. We replace the return-based volatility measures with z-scores and perform the same regression analysis as in Equation (1). We expect ESG to be positively associated with z-score, consistently with our previous findings that suggest the risk-mitigating effects of ESG. The results are reported in Table 8. We find that the composite ESG scores are positively associated with z-score, which is mainly driven by the governance pillar, G. This finding is also consistent with some of the previous literature that have found a positive relation between ESG and z-score in the Eurozone banks.

7 | CONCLUSION

The U.S. financial sector holds a predominant position in global finance, where sustainable and responsible business practice has become essential to fulfill stakeholder expectations and maintain competitiveness. Nevertheless, previous research has left many questions unanswered regarding ESG adoption, practice, and performance in U.S. financial firms. This study empirically examines the relationship between ESG performance and firm risks, based on a sample of 453 U.S. publicly traded financial firms during the period of 2014–2020. Our finding of a robust negative relationship between ESG and firm risk (total, idiosyncratic, and systematic) underscores ESG as not only an ethically imperative practice but also as a strategic tool for risk management in financial firms. Furthermore, we analyze the interplay between ESG and firm leverage in relation to firm risk, discovering that ESG lessens the positive association between leverage and firm risk. This suggests that ESG can counteract the inherent risks associated with high leverage, thus reducing overall firm risk by mitigating financial risk.

TABLE 7 VAR panel granger causality test.

Null hypotheses	χ^2	p-Value	Inference
TVOL			
$H_0: \delta_{1,1} = \delta_{1,2} = 0$	7.569	.020**	ESG negatively G-causes TVOL
$H_0: \beta_{2,1} = \beta_{2,2} = 0$	1.01	.577	TVOL do **not** G-cause ESG
IVOL			
$H_0: \delta_{1,1} = \delta_{1,2} = 0$	14.691	.000***	ESG negatively G-causes IVOL
$H_0: \beta_{2,1} = \beta_{2,2} = 0$	1.324	.542	IVOL do **not** G-cause ESG
Beta			
$H_0: \delta_{1,1} = \delta_{1,2} = 0$	3.351	.179	ESG does not G-cause Beta
$H_0: \beta_{2,1} = \beta_{2,2} = 0$	4.562	.120	Beta does not G-cause ESG

Note: Results from testing the panel Granger-causality between each of the risk measures and ESG. The VAR model was estimated using GMM, and the Wald test statistics are constructed to test the null hypothesis of non-causality. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

TABLE 8 Panel regressions of *z*-scores on ESG ratings.

	***z*-score**			
ESG	0.164**			
	(0.082)			
E		0.018		
		(0.039)		
S			0.158	
			(0.204)	
G				0.172**
				(0.087)
MKEBKE	0.985	−1.274**	−0.0378*	−0.049***
	(1.146)	(0.528)	(0.0201)	(0.012)
FSIZE	6.406*	7.392**	0.042***	0.242***
	(3.223)	(3.696)	(0.012)	(0.034)
ROA	−21.971	−17.482	3.229***	3.197
	(36.65)	(16.327)	(0.395)	(0.398)
STDROA	−80.562***	−91.296***	−30.50***	−30.016
	(7.754)	(8.194)	(0.692)	(0.819)
LEVERAGE	−21.40*	−23.58**	−0.512***	−0.127
	(12.063)	(10.283)	(0.0661)	(0.910)
LIQUIDITY	2.038	3.913	0.134***	0.301**
	(1.512)	(3.037)	(0.0155)	(0.182)
DIVIDEND	20.96	21.377	2.305	3.103
	(26.45)	(20.712)	(0.317)	(3.059)
OWNERSHIP	18.42	21.481*	3.036***	4.296**
	(13.54)	(11.275)	(0.869)	(2.322)
Constant	1.329***	2.482***	2.611***	1.495***
	(0.381)	(0.433)	(0.327)	(0.365)
Observations	2610	2478	2478	2478
No. of firms	435	413	413	413
Adj. R^2	.625	.472	.491	.610
$F(9,434)$	4.38***	3.12***	3.29***	4.16***
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Note: The results of the pooled OLS regression of *z*-score bank risk measures on contemporaneous ESG ratings and firm variables, including the market-to-book-equity ratio, logged firm size, stock returns, return on assets (ROA), leverage (debt-to-asset ratio), standard deviation of ROA (STDROA), liquidity, dividend payout ratio, and CEO equity ownership during the 2014–2020 period. The regression includes the year and firm fixed effects, and standard errors are clustered by year.

***$p < .01$; **$p < .05$; *$p < .1$.

Our research is subject to certain limitations. First, generalizability of our findings may be restricted to financial firms and the specific timeframe of 2014–2020. Our sample period does not include significant, prolonged crises in the U.S. and may be characterized as a "normal" economic state, especially when compared to adjacent periods such as the pandemic era from 2020 through 2022. Future research could explore how varying economic conditions might impact the interplay between ESG and firm risk. Second, our reliance on the Sustainalytics database for ESG ratings introduces limitations. Similar to other ESG rating providers like MSCI-KLD and ASSET4 (Thompson Reuter), the Sustainalytics data is prone to biases and shortcomings. These biases are associated with selection and company size because the database depends on voluntary reporting, media coverage, and publicity of ESG activities by firms (Doyle, 2018). For instance, political risk assessment based on media sources might introduce biases against larger and/or more well-known companies that

attract more news coverage. While we have confidence in the overall quality of the Sustainalytics database, testing our results with alternative datasets would add robustness to our findings.

Our findings offer practical implications for various stakeholders including managers, investors, and policymakers in their assessment of financial firms. The evidence that all three pillars of ESG are significantly related to lower firm risk should motivate financial firm managers to engage in environmental, social, and governance initiatives broadly. Particularly for managers of highly leveraged firms, our analysis recommends that ESG practices can mitigate financial risk, making ESG an attractive strategy. For investors, prioritizing financial firms with robust ESG practices could be a prudent approach to reduce exposure to both idiosyncratic and systematic risks. This strategy becomes even more relevant when investing in highly leveraged financial firms, where a higher ESG rating could signify reduced financial risk. Policymakers and regulatory bodies should consider our findings when developing policies that bolster ESG practices in financial firms. Such policies could reduce the firms' adverse externalities on the market and foster the overall market stability.

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ENDNOTES

[1] https://www.unepfi.org/banking/prbsignatories.

[2] https://www.unepfi.org/insurance/insurance/signatory-companies.

[3] For instance, Basel III, first endorsed in November 2010, specifically requires that banks to have 4.5% of risk-weighted assets funded by common equity at all times, up from 2% ratio required by Basel II (www.bis.org/bcbs/basel3). Similarly, U.S. insurers are regulated by the risk-based capital (RBC) system, which allows regulators to identify and legally take control of weakly capitalized companies (From the article titled "Risk-based Capital" on www.content.naic.org, June 2023).

[4] The U.S. is the world's largest single-country insurance market, with a 44% market share of global direct premiums (from Federal Insurance Office, U.S. Department of Treasury. "Annual Report on the Insurance Industry September 2023").

[5] In the Modigliani and Miller (1958) framework, business risk arises from asset- and operation-related risks.

[6] A Bloomberg article "ECB Sends Stark Warning to Bank Executives With ESG Regulation" on Nov 14, 2023.

[7] Firms listed among NAICS Codes of "Environmentally Sensitive Industries", including mining, engineering, textile production, and transportation—do not include financial firms.

[8] See sec 5.3 Endogeneity in Sassen et al. (2016). Using the lag of two also follows their choice.

REFERENCES

Acharya, V. V. (2009). A theory of systemic risk and design of prudential bank regulation. *Journal of Financial Stability*, *5*, 224–255. https://doi.org/10.1016/j.jfs.2009.02.001

Acharya, V. V., & Thakor, A. V. (2016). The dark side of liquidity creation: Leverage and systemic risk. *Journal of Financial Intermediation*, *28*, 4–21. https://doi.org/10.1016/j.jfi.2016.08.004

Aghion, P., Bolton, P., & Dewatripont, M. (2000). Contagious bank failures in a free banking system. *European Economic Review*, *44*, 713–718. https://doi.org/10.1016/S0014-2921(00)00058-1

Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate social responsibility and firm risk: Theory and empirical evidence. *Management Science*, *65*, 4451–4469. https://doi.org/10.1287/mnsc.2018.3043

Ang, A., Hodrick, R. J., Xing, Y., & Zhang, X. (2006). The cross-section of volatility and expected returns. *The Journal of Finance*, *61*, 259–299. https://doi.org/10.1111/j.1540-6261.2006.00836.x

Antoniuk, Y., & Leirvik, T. (2021). Climate change events and stock market returns. *Journal of Sustainable Finance & Investment*, *1–26*, 42–67. https://doi.org/10.1080/20430795.2021.1929804

Aramburu, I. A., & Pescador, I. G. (2019). The effects of corporate social responsibility on customer loyalty: The mediating effect of reputation in cooperative banks versus commercial banks in the Basque Country. *Journal of Business Ethics*, *154*, 701–719. https://doi.org/10.1007/s10551-017-3438-1

Bae, K.-H., El Ghoul, S., Guedhami, O., Kwok, C. C. Y., & Zheng, Y. (2019). Does corporate social responsibility reduce the costs of high leverage? Evidence from capital structure and product market interactions. *Journal of Banking & Finance*, *100*, 135–150. https://doi.org/10.1016/j.jbankfin.2018.11.007

Baker, M., & Wurgler, J. (2013). *Do strict capital requirements raise the cost of capital? Banking regulation and the low risk anomaly (No. w19018)*. National Bureau of Economic Research. https://doi.org/10.3386/w19018

Barclift, Z. J. (2012). Corporate social responsibility and financial institutions: Beyond Dodd-frank. Banking & Financial Services Policy Report, 31.

Barnea, A., & Rubin, A. (2010). Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics*, *97*, 71–86. https://doi.org/10.1007/s10551-010-0496-z

Bauer, R., Derwall, J., & Hann, D. (2009). Employee relations and credit risk. *SSRN Journal*. https://doi.org/10.2139/ssrn.1483112

Bebchuk, L. A., Cohen, A., & Spamann, H. (2010). The wages of failure: Executive compensation at bear Stearns and Lehman 2000–2008. *Yale Journal on Regulation*, *27*, 257–282.

Belkhir, M., Ben Naceur, S., Chami, R., & Semet, A. (2019). Bank capital and the cost of equity. IMF Working Papers 19. https://doi.org/10.5089/9781513519807.001

Bernal, O., Gnabo, J.-Y., & Guilmin, G. (2014). Assessing the contribution of banks, insurance and other financial services to systemic risk. *Journal of Banking & Finance*, *47*, 270–287. https://doi.org/10.1016/j.jbankfin.2014.05.030

Bessler, W., Kurmann, P., & Nohel, T. (2015). Time-varying systematic and idiosyncratic risk exposures of US bank holding companies. *Journal of International Financial Markets, Institutions and Money*, *35*, 45–68. https://doi.org/10.1016/j.intfin.2014.11.009

Bhattacharyya, S., & Purnanandam, A. K. (2011). Risk-taking by banks: What did we know and when did we know it? *SSRN Journal*. https://doi.org/10.2139/ssrn.1619472

Bolton, P., & Kacperczyk, M. T. (2020). *Carbon premium around the world*. CEPR Discussion Paper.

Bouslah, K., Kryzanowski, L., & M'Zali, B. (2013). The impact of the dimensions of social performance on firm risk. *Journal of Banking & Finance*, *37*, 1258–1273. https://doi.org/10.1016/j.jbankfin.2012.12.004

Boyd, J. H., & Graham, S. L. (1986). Risk, regulation, and bank holding company expansion into nonbanking. *Quarterly Review, Federal Reserve Bank of Minneapolis*, *10*, 2–17.

Boyd, J. H., Graham, S. L., & Hewitt, R. S. (1993). Bank holding company mergers with nonbank financial firms: Effects on the risk of failure. *Journal of Banking & Finance*, *17*, 43–63. https://doi.org/10.1016/0378-4266(93)90079-S

Cai, Y., Jo, H., & Pan, C. (2012). Doing well while doing bad? CSR in controversial industry sectors. *Journal of Business Ethics*, *108*, 467–480. https://doi.org/10.1007/s10551-011-1103-7

Cao, Y., Myers, J. N., Myers, L. A., & Omer, T. C. (2015). Company reputation and the cost of equity capital. *Review of Accounting Studies*, *20*, 42–81. https://doi.org/10.1007/s11142-014-9292-9

Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, *52*, 57–82. https://doi.org/10.1111/j.1540-6261.1997.tb03808.x

Cespa, G., & Cestone, G. (2007). Corporate social responsibility and managerial entrenchment. *Journal of Economics and Management Strategy*, *16*, 741–771. https://doi.org/10.1111/j.1530-9134.2007.00156.x

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2011). Does it really pay to be green? Determinants and consequences of proactive environmental strategies. *Journal of Accounting and Public Policy*, *30*, 122–144. https://doi.org/10.1016/j.jaccpubpol.2010.09.013

Cohen, L. J., Cornett, M. M., Marcus, A. J., & Tehranian, H. (2014). Bank earnings management and tail risk during the financial crisis. *Journal of Money, Credit and Banking*, *46*, 171–197. https://doi.org/10.1111/jmcb.12101

Di Tommaso, C., & Thornton, J. (2020). Do ESG scores effect bank risk taking and value? Evidence from European banks. *Corporate Social Responsibility and Environmental Management*, *27*, 2286–2298. https://doi.org/10.1002/csr.1964

Doyle, T. (2018). Ratings that don't rate: The subjective world of ESG ratings agencies.

El Ghoul, S., Guedhami, O., Kim, H., & Park, K. (2018). Corporate environmental responsibility and the cost of capital: International evidence. *Journal of Business Ethics*, *149*, 335–361. https://doi.org/10.1007/s10551-015-3005-6

El Ghoul, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, *35*, 2388–2406. https://doi.org/10.1016/j.jbankfin.2011.02.007

Fabozzi, F. J., Ng, P. W., & Tunaru, D. E. (2021). The impact of corporate social responsibility on corporate financial performance and credit ratings in Japan. *Journal of Asset Management*, *22*, 79–95. https://doi.org/10.1057/s41260-021-00204-6

Fombrun, C. J., Gardberg, N. A., & Barnett, M. L. (2000). Opportunity platforms and safety nets: Corporate citizenship and reputational risk. *Business and Society Review*, *105*, 85–106. https://doi.org/10.1111/0045-3609.00066

Francis, B., Hasan, I., & Li, L. (2016). Abnormal real operations, real earnings management, and subsequent crashes in stock prices. *Review of Quantitative Finance and Accounting*, *46*, 217–260. https://doi.org/10.1007/s11156-014-0468-y

Friedman, M. (1970). A Friedman doctrine-the social responsibility of business is to increase its profits. *New York Times*.

Galletta, S., Goodell, J. W., Mazzù, S., & Paltrinieri, A. (2023). Bank reputation and operational risk: The impact of ESG. *Finance Research Letters*, *51*, 103494. https://doi.org/10.1016/j.frl.2022.103494

Gangi, F., Meles, A., D'Angelo, E., & Daniele, L. M. (2019). Sustainable development and corporate governance in the financial system: Are environmentally friendly banks less risky? *Corporate Social Responsibility and Environmental Management*, *26*, 529–547. https://doi.org/10.1002/csr.1699

Gao, L., Sheikh, S., & Zhou, H. (2022). Executive compensation linked to corporate social responsibility and firm risk. *International Journal of Multiphase Flow*, *19*, 269–290. https://doi.org/10.1108/IJMF-10-2021-0511

Gardberg, N. A., & Fombrun, C. J. (2006). Corporate citizenship: Creating intangible assets across Institutional environments. *Academy of Management Review*, *31*, 329–346. https://doi.org/10.5465/amr.2006.20208684

Gelb, D. S., & Strawser, J. A. (2001). Corporate social responsibility and financial disclosures: An alternative explanation for increased disclosure. *Journal of Business Ethics*, *33*, 1–13. https://doi.org/10.1023/A:1011941212444

Giese, G., Lee, L.-E., Melas, D., Nagy, Z., & Nishikawa, L. (2019). Foundations of ESG investing: How ESG affects equity valuation, risk, and performance. *The Journal of Portfolio Management*, *45*, 69–83. https://doi.org/10.3905/jpm.2019.45.5.069

Godfrey, P. C., Merrill, C. B., & Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis. *Strategic Management Journal*, *30*, 425–445. https://doi.org/10.1002/smj.750

He, F., Qin, S., Liu, Y., & Wu, J. (G.). (2022). CSR and idiosyncratic risk: Evidence from ESG information disclosure. *Finance Research Letters*, *49*, 102936. https://doi.org/10.1016/j.frl.2022.102936

Hemingway, C. A., & Maclagan, P. W. (2004). Managers' personal values as drivers of corporate social responsibility. *Journal of Business Ethics*, *50*, 33–44. https://doi.org/10.1023/B:BUSI.0000020964.80208.c9

Herremans, I. M., Akathaporn, P., & McInnes, M. (1993). An investigation of corporate social responsibility reputation and economic performance. *Accounting, Organizations and Society*, *18*, 587–604. https://doi.org/10.1016/0361-3682(93)90044-7

Hill, C. W. L., & Jones, T. M. (1992). Stakeholder-agency theory. *Journal of Management Studies*, *29*, 131–154. https://doi.org/10.1111/j.1467-6486.1992.tb00657.x

Hoepner, A. G. F., Oikonomou, I., Sautner, Z., Starks, L. T., & Zhou, X. Y. (2016). ESG shareholder engagement and downside risk. *Review of Finance*, *28*, 483–510. https://doi.org/10.2139/ssrn.2874252

Hong, H., & Kacperczyk, M. (2009). The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, *93*, 15–36. https://doi.org/10.1016/j.jfineco.2008.09.001

Hong, H., & Liskovich, I. (2015). *Crime, punishment and the halo effect of corporate social responsibility (No. w21215)*. National Bureau of Economic Research. https://doi.org/10.3386/w21215

Hou, M., Liu, H., Fan, P., & Wei, Z. (2016). Does CSR practice pay off in east Asian firms? A meta-analytic investigation. *Asia Pacific Journal of Management*, *33*, 195–228. https://doi.org/10.1007/s10490-015-9431-2

Hsu, K.-T. (2012). The advertising effects of corporate social responsibility on corporate reputation and brand equity: Evidence from the life insurance industry in Taiwan. *Journal of Business Ethics*, *109*, 189–201. https://doi.org/10.1007/s10551-011-1118-0

Huang, D. Z. X. (2021). Environmental, social and governance (ESG) activity and firm performance: A review and consolidation. *Accounting and Finance*, *61*, 335–360. https://doi.org/10.1111/acfi.12569

Hutton, A. P., Marcus, A. J., & Tehranian, H. (2009). Opaque financial reports, R2, and crash risk. *Journal of Financial Economics*, *94*, 67–86. https://doi.org/10.1016/j.jfineco.2008.10.003

Izcan, D., & Bektas, E. (2022). The relationship between ESG scores and firm-specific risk of eurozone banks. *Sustainability*, *14*, 8619. https://doi.org/10.3390/su14148619

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*, 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Jiraporn, P., & Chintrakarn, P. (2013). How do powerful CEOs view corporate social responsibility (CSR)? An empirical note. *Economics Letters*, *119*, 344–347. https://doi.org/10.1016/j.econlet.2013.03.026

Jizi, M., Nehme, R., & Salama, A. (2016). Do social responsibility disclosures show improvements on stock price? *The Journal of Developing Areas*, *50*, 77–95. https://doi.org/10.1353/jda.2016.0075

Jo, H., & Harjoto, M. A. (2011). Corporate governance and firm value: The impact of corporate social responsibility. *Journal of Business Ethics*, *103*, 351–383. https://doi.org/10.1007/s10551-011-0869-y

Jo, H., & Na, H. (2012). Does CSR reduce firm risk? Evidence from controversial industry sectors. *Journal of Business Ethics*, *110*, 441–456. https://doi.org/10.1007/s10551-012-1492-2

Kalemli-Ozcan, S., Sorensen, B., & Yesiltas, S. (2012). Leverage across firms, banks, and countries. *Journal of International Economics*, *88*, 284–298. https://doi.org/10.1016/j.jinteco.2012.03.002

Kim, Y., Li, H., & Li, S. (2014). Corporate social responsibility and stock price crash risk. *Journal of Banking & Finance*, *43*, 1–13. https://doi.org/10.1016/j.jbankfin.2014.02.013

Kim, Y., Park, M. S., & Wier, B. (2012). Is earnings quality associated with corporate social responsibility? *The Accounting Review*, *87*, 761–796. https://doi.org/10.2308/accr-10209

Lacey, R., & Kennett-Hensel, P. A. (2010). Longitudinal effects of corporate social responsibility on customer relationships. *Journal of Business Ethics*, *97*, 581–597. https://doi.org/10.1007/s10551-010-0526-x

Lee, D. D., & Faff, R. W. (2009). Corporate sustainability performance and idiosyncratic risk: A global perspective. *Financial Review*, *44*, 213–237. https://doi.org/10.1111/j.1540-6288.2009.00216.x

Lee, S., Park, Y., & Klassen, R. D. (2015). Market responses to Firms' voluntary climate change information disclosure and carbon communication. *Corporate Social Responsibility and Environmental Management*, *22*, 1–12. https://doi.org/10.1002/csr.1321

Li, F., Li, T., & Minor, D. (2016). CEO power, corporate social responsibility, and firm value: A test of agency theory. *International Journal of Multiphase Flow*, *12*, 611–628. https://doi.org/10.1108/IJMF-05-2015-0116

Li, H., Zhang, X., & Zhao, Y. (2022). ESG and firm's default risk. *Finance Research Letters*, *47*, 102713. https://doi.org/10.1016/j.frl.2022.102713

Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *The Journal of Finance*, *72*, 1785–1824. https://doi.org/10.1111/jofi.12505

Luo, X., & Bhattacharya, C. B. (2009). The debate over doing good: Corporate social performance, strategic marketing levers, and firm-idiosyncratic risk. *Journal of Marketing*, *73*, 198–213. https://doi.org/10.1509/jmkg.73.6.198

Malkiel, B. G., & Xu, Y. (1997). Risk and return revisited. *The Journal of Portfolio Management*, *23*, 9–14. https://doi.org/10.3905/jpm.1997.409608

McWilliams, A., & Siegel, D. (2001). Corporate social responsibility: A theory of the firm perspective. *The Academy of Management Review*, *26*, 117. https://doi.org/10.2307/259398

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*, *48*, 261–297.

Neitzert, F., & Petras, M. (2022). Corporate social responsibility and bank risk. *Journal of Business Economics*, *92*, 397–428. https://doi.org/10.1007/s11573-021-01069-2

Oikonomou, I., Brooks, C., & Pavelin, S. (2012). The impact of corporate social performance on financial risk and utility: A longitudinal analysis. *Financial Management*, *41*, 483–515. https://doi.org/10.1111/j.1755-053X.2012.01190.x

Orlitzky, M., & Benjamin, J. D. (2001). Corporate social performance and firm risk: A meta-analytic review. *Business & Society*, *40*, 369–396. https://doi.org/10.1177/000765030104000402

Petrovits, C. M. (2006). Corporate-sponsored foundations and earnings management. *Journal of Accounting and Economics*, *41*, 335–362. https://doi.org/10.1016/j.jacceco.2005.12.001

Preston, L. E., & Sapienza, H. J. (1990). Stakeholder management and corporate performance. *Journal of Behavioral Economics*, *19*, 361–375. https://doi.org/10.1016/0090-5720(90)90023-Z

Prior, D., Surroca, J., & Tribó, J. A. (2008). Are socially responsible managers really ethical? Exploring the relationship between earnings management and corporate social responsibility. *Corporate Governance: An International Review*, *16*, 160–177. https://doi.org/10.1111/j.1467-8683.2008.00678.x

Sassen, R., Hinze, A.-K., & Hardeck, I. (2016). Impact of ESG factors on firm risk in Europe. *Journal of Business Economics*, *86*, 867–904. https://doi.org/10.1007/s11573-016-0819-3

Shim, J. (2010). Capital-based regulation, portfolio risk and capital determination: Empirical evidence from the US property–liability insurers. *Journal of Banking & Finance*, *34*, 2450–2461. https://doi.org/10.1016/j.jbankfin.2010.04.003

Shleifer, A., & Vishny, R. W. (1989). Management entrenchment. *Journal of Financial Economics*, *25*, 123–139. https://doi.org/10.1016/0304-405X(89)90099-8

Surroca, J., & Tribó, J. A. (2008). Managerial entrenchment and corporate social performance. *Journal of Business Finance & Accounting*, *35*, 748–789. https://doi.org/10.1111/j.1468-5957.2008.02090.x

Surroca, J., Tribó, J. A., & Waddock, S. (2010). Corporate responsibility and financial performance: The role of intangible resources: Intangibles, corporate responsibility, and financial performance. *Strategic Management Journal*, *31*, 463–490. https://doi.org/10.1002/smj.820

Turban, D. B., & Greening, D. W. (1997). Corporate social performance and organizational attractiveness to prospective employees. *Academy of Management Journal*, *40*, 658–672. https://doi.org/10.2307/257057

Utz, S. (2018). Over-investment or risk mitigation? Corporate social responsibility in Asia-Pacific, Europe, Japan, and the United States. *Review of Financial Economics*, *36*, 167–193. https://doi.org/10.1016/j.rfe.2017.10.001

Waddock, S. A., & Graves, S. B. (1997). The corporate social performance-financial performance link. *Strategic Management Journal*, *18*, 303–319. https://doi.org/10.1002/(SICI)1097-0266(199704)18:4<303::AID-SMJ869>3.0.CO;2-G

Wagner, W. (2010). In the quest of systemic externalities: A review of the literature. *CESifo Economic Studies*, *56*, 96–111. https://doi.org/10.1093/cesifo/ifp022

Wright, P., Ferris, S. P., Sarin, A., & Awasthi, V. (1996). Impact of corporate insider, blockholder, and institutional equity ownership on firm risk taking. *Academy of Management Journal*, *39*, 441–458. https://doi.org/10.2307/256787

Xu, Y., & Malkiel, B. G. (2004). Idiosyncratic risk and security returns. *SSRN Journal*. https://doi.org/10.2139/ssrn.255303

Yang, L., Zhou, Q., & Zhu, M. (2021). De-risking through equity holdings: Bank and insurer behavior under capital requirements. *Journal of Business Finance & Accounting*, *48*, 1889–1917. https://doi.org/10.1111/jbfa.12526

Zawadowski, A. (2013). Entangled financial systems. *Review of Financial Studies*, *26*, 1291–1323. https://doi.org/10.1093/rfs/hht008

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