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Do Lenders Value a Corporate Sustainability Structure?—Evidence from the Cost of Bank Loans

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Abstract: In response to pressures placed on a firm by its stakeholders, managers may initiate various corporate sustainability activities. In such cases, they need to make decisions not only about the level of sustainability commitment, but also about the way to structure it. There are numerous ways to structure corporate sustainability activities with different financial consequences. In this paper, we investigate the separate and joint effects of the corporate sustainability level and the corporate sustainability structure on a firm's bank borrowing cost. We test our predictions by conducting multivariate regression analysis on a sample of 1417 US bank loan facilities over the period 2006–2011. We find evidence that high-quality borrowers with a high level or diversified structure of sustainability activities benefit from lower loan interest rates. Also, our analysis of the joint effects shows that only high-quality borrowers with a high level and diversified sustainability activities enjoy lower bank loan costs. Overall, these results reveal that lenders value how firms structure their sustainability activities. Therefore, they have important implications for managers and bankers.

Keywords: corporate sustainability; CSR strengths; sustainability structure; cost of bank loans; borrowers; lenders

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1. Introduction

Nowadays, the managers of firms are under multiple and continuous pressures to engage in a wide range of sustainability activities, such as those related to employee relations, the community, and the environment. In response to these pressures, they increasingly devote important resources to corporate sustainability activities. For example, a survey carried out by Deloitte (2019) [1] revealed that 59 percent of CEOs allocate one to five percent of revenues to corporate sustainability initiatives.It showed a consistent increase in allocations over the last two years.

Given the large variety of sustainability activities, managers can structure their firms' sustainability commitments in countless ways. Despite the extensive literature on the financial consequences of corporate sustainability activities exists, the majority of this literature uses sustainability scores, which reflect the level of efforts devoted to sustainability [2] and ignores how these efforts are structured.

The scarce academic studies investigating the heterogeneity in how firms engage in sustainability activities (e.g., [2–8]) unveil the importance of considering structure differences when linking sustainability commitment to a firm's financial performance. For instance, Seo et al. [7] reveal that diversification across causes in donations is more profitable for large U.S. firms. Also, Bouslah et al. [8] find that diversified CSR structures are more beneficial regarding firm value thanfirms with focused CSR structures. In this paper, we extend this stream of studies by exploring how lenders value borrowers' sustainability structures. More specifically, we question whether the diversified and specialized corporate sustainability structures have

different effects on the cost of a bank loan. This is particularly important because previous studies show that firms exhibit a general tendency to use specialized structures in their corporate sustainability commitment [8]. According to the existing theoretical literature, two opposing views predict the effects of corporate sustainability activities on a firm's financial performance. The overinvestment view (e.g., [9–11]) predicts a positive (unfavourable) effect, while the risk mitigation view (e.g., [11–14]) predicts a negative (favourable) effect.

These predictions have to be qualified when studying the impact of the level of sustainability activities on a firm's cost of a bank loan. In particular, the prior literature highlights the importance of considering the quality of the borrower [11,15]). Therefore, the positive (unfavourable) effect of corporate sustainability predicted by the overinvestment view is more likely to be prevalent among low-quality borrowers. Conversely, the negative (favourable) effect of corporate sustainability predicted by the risk mitigation view is more likely to be prevalent among high-quality borrowers [11].

These predictions are adjusted using corporate sustainability structures, which capture how managers compose a firm's sustainability activities. Based on the overinvestment view, we do not expect differences between the diversified and the specialized sustainability structures in their effects on the cost of bank loans. Indeed, both structures are seen as a waste of corporate resources.

Under the risk mitigation view, it is more likely that a diversified (specialized) sustainability structure decreases (increases) a firm's cost of a bank loan. Diversified (Specialized) structures of corporate sustainability are more (less) likely to deal with a broad range of sustainability issues. Consequently, diversified (specialized) structures of corporate sustainability activities are more (less) likely to reduce a firm's risk [11–14], and, thereby, more (less) likely to decrease (increase) the interest rates for the borrower.

To test our hypotheses, we merge the corporate sustainability data from MSCI ESG STATS (formerly KLD Research & Analytic Inc. Boston, MA, USA.) with the bank loan facility variables obtained from the DealScan database and the financial and accounting data gathered from Compustat. The final data sample consists of 1417 U.S. bank loan facilities and covers the period from 2006 to 2011.

Our analysis provides evidence of three important results. First, we find that a high level of corporate sustainability activities decreases the cost of a bank loan for high-quality borrowers. This finding supports the prior literature that links corporate sustainability to the cost of debt (e.g., [11,16–20]). Second, we find evidence that a diversified structure of corporate sustainability decreases the cost of a bank loan for high-quality borrowers. Third, we find evidence that the decreasing effect of corporate sustainability on a firm's cost of a bank loan prevails only for high-quality borrowers with a high level and diversified structure of sustainability initiatives. The last two results of a decreasing effect of diversified corporate sustainability structures on a firm's cost of a bank loan are consistent with the studies of Seo et al. [7] and Bouslah et al. [8], and more generally, with the literature that explores the financial consequences of heterogeneity in corporate sustainability commitment.

This paper makes three important contributions to the literature. First, it contributes to the large body of literature investigating the relationship between corporate sustainability activities and financial performance. This literature mainly uses sustainability scores, which reflect the level of effort that firms devote to sustainability [2], while only a few studies consider how these efforts are structured. Our study complements these prior studies by proving that lenders value high-quality borrowers' sustainability structures. We show that lenders differentiate between high-quality borrowers with diversified sustainability structures and those with specialized sustainability structures when assessing the cost of bank loans.

Second, we add to this literature by providing evidence of a joint effect of the level and the structure of corporate sustainability on the cost of bank loans. To the best of our knowledge, this is the first study to combine the level and the structure.

Third, this study contributes to the line of literature highlighting the existing and important heterogeneity in corporate sustainability commitment (e.g., [2–8]). More specifi-

cally, it adds to the recent literature that explores the financial consequences of corporate sustainability structures (e.g., [6–8]). Our results provide evidence that lenders value a high level and a diversified structure of corporate sustainability for high-quality borrowers by offering a reduced cost of bank loans.

The rest of the paper is organized as follows. Section 2 provides the literature review and hypotheses development. Section 3 presents the data, variables, and research methodology. Section 4 reports the empirical findings. In Section 5, we discuss these results and conclude the paper.

2. Literature Review and Hypotheses Development

2.1. Corporate Sustainability and the Cost of Bank Loans

According to the existing literature, two competing views predict the effects of corporate sustainability activities on a firm's cost of bank loans: (1) the overinvestment view and (2) the risk mitigation view.

The overinvestment view is drawn from the agency theory and considers firms' commitment to sustainability activities as agency costs that destroy the limited corporate financial resources [8]. A firm's managers have different incentives to overinvest using corporate sustainability. They can overinvest in sustainability activities to reduce the threat of their replacement [9]. Through these activities, they can handle and strengthen their relations with the firm's key stakeholders; Consequently, they can gain support from these stakeholders. As such, they become almost unavoidable for the firm management. Also, they can overinvest in using sustainability activities to enhance their personal reputation and thereby obtain the private benefits associated with it [10].

Under the risk mitigation view, corporate sustainability activities reduce a firm's exposure to risks [11–14] and thus reduce the possible future cash-outflows associated with social, environmental, and governance crises or concerns. Also, by signaling the quality of a firm's management [21], these sustainability activities can decrease the information asymmetry between investors, including debt holders, and a firm's managers. This translates into a reduced risk for the firm, and, ultimately, a lower debt cost for it.

Overall, the overinvestment and the risk mitigation views, respectively, predict an unfavourable and a favourable effect of corporate sustainability activities on a firm's cost of debt. However, this conclusion needs to be qualified. It is important to consider the quality of the borrower when studying the determinants of a firm's bank loan cost, as suggested in the prior literature [11–15]. This reflects the banker's preference to provide loans to high-credit quality borrowers who can make the agreed-upon repayments.

With regard to our study, the positive (unfavourable) effect of corporate sustainability predicted by the overinvestment view is more likely to be prevalent among low-quality borrowers [11]. Conversely, the negative (favourable) effect of corporate sustainability predicted by the risk mitigation view is more likely to be prevalent among high-quality borrowers. Therefore, based on the overinvestment view, we hypothesise that:

Hypothesis 1a: *A high level of sustainability activities of low-quality borrowers increases the cost of a bank loan.*

Alternatively, based on the risk mitigation view, we hypothesise that:

Hypothesis 1b: *A high level of sustainability activities of high-quality borrowers decreases the cost of a bank loan.*

2.2. Corporate Sustainability Structure and the Cost of Bank Loans

To cater to their stakeholders' expectations, corporations engage in different sustainability activities. For instance, they may engage with the community, employee relations, diversity, environment, product, human rights, and governance issues. Given this variety in sustainability activities, there are countless ways in which a manager might structure a

firm's sustainability commitment. Surprisingly few academic studies reflect this heterogeneity when investigating the link between corporate sustainability and financial performance (e.g., [2–8]). Most of the empirical literature uses sustainability scores, reflecting the firm's sustainability efforts [2]. We refer to these efforts as the firm's sustainability level.

The few studies which explore the variations in how firms structure their sustainability activities (e.g., [2–8]) reveal the importance of considering such structures when investigating the link between sustainability commitment and a firm's financial performance. For example, Seo et al. [7] find that diversification across causes in corporate donations increases large U.S. firms' profitability. Similarly, Bouslah et al. [8] reveal that diversified CSR structures are more interesting in terms of firm value relative to firms with specialized CSR structures.

Following and extending this line of literature, we question whether bankers consider borrowers' sustainability structures when they assess the cost of loans. More specifically, do the diversified and specialized corporate sustainability structures affect the cost of a bank loan, and are these effects different?

Under the overinvestment view, sustainability activities are considered a waste of the firm limited financial resources. These resources are allocated to one sustainability issue (i.e., specialized structures), to all sustainability issues, or many sustainability issues (i.e., diversified structures). This kind of firm commitment will negatively affect the cost of a bank loan. Therefore, based on the overinvestment view, we do not expect differences between the diversified and the specialized sustainability structures in their effects on the cost of bank loans.

Under the risk mitigation view, corporate sustainability activities reduce a firm's risk [11–14], which translates into a lower cost of debt financing. However, on average, this effect is more likely to materialize with diversified rather than specialized sustainability structures. This is because diversified structures of sustainability activities are more likely to deal with various sustainability issues. Hence, under this view, it is more likely that a diversified (specialized) sustainability structure decreases (increases) a firm's cost of bank loans.

As our first two hypotheses, which consider the importance of the borrower credit quality, the above discussion enables us to announce the following two alternative hypotheses based on the overinvestment and the risk mitigation views, respectively:

Hypothesis 2a: *The diversified and specialized sustainability activity structures of low-quality borrowers increase the cost of bank loans*.

Hypothesis 2b: *The diversified sustainability activities structure of high-quality borrowers decreases the cost of bank loans*.

In the previous four hypotheses, we separately predict the effects of corporate sustainability as captured by the level and the structure of sustainability activities on the cost of bank loans. Nevertheless, both aspects of corporate sustainability jointly affect a firm's bank financing. Therefore, building on the overinvestment view and the aforementioned literature and discussion, we expect that:

Hypothesis 3a: *The high level and diversified sustainability activities of low-quality borrowers increase the cost of bank loans*.

Alternatively, under the risk mitigation view, we predict that:

Hypothesis 3b: *The high level and diversified sustainability activities of high-quality borrowers decrease the cost of bank loans*.

3. Data and Methodology

3.1. Data

We construct our sample by merging data from three databases: MSCI ESG STATS, DealScan, and Compustat. MSCI ESG STATS provides annual binary data on U.S. public firms' environmental, social, and governance (ESG) attributes. These attributes cover seven qualitative dimensions with strength and concern scores: community, diversity, employee relations, the environment, product, human rights, and governance. The DealScan database provides the all-in-drawn loan spreads, while the Compustat database gives detailed accounting and financial data.

We follow the previous literature and restrict our sample to non-financial (SIC codes 6000–6999) firms. Our final data sample covers the period from 2006 to 2011 and consists of 1,417 U.S. bank loan facilities.

3.2. Methodology

To test our hypotheses and build on the prior literature, we link a firm's sustainability activities to its cost of a bank loan by using the three following econometric specifications:

$$Ln(Spread)_{i,t} = \alpha_0 + \alpha_1 Sus\_score_{i,t} + \sum_{i=1,m} \alpha_{i+1} CV_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$Ln(Spread)_{i,t} = \alpha_0 + \alpha_1 Sus\_structure_{i,t} + \sum_{i=1,m} \alpha_{i+1} CV_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$Ln(Spread)_{i,t} = \alpha_0 + \alpha_1 Sus\_score_{i,t} + \alpha_2 Sus\_structure_{i,t} + \alpha_3 Sus\_score_{i,t} * Sus_{structurei,t} + \sum_{i=1,m} \alpha_{i+3} CV_{i,t} + \varepsilon_{i,t} \quad (3)$$

where *Ln(Spread)* is the natural logarithm of the spread charged by banks on a firm's loan; and *Sus_score* is a dummy variable capturing the level of sustainability commitment. It equals one (zero) for firms that engage in a high (low) level of sustainability activities. Then, *Sus_structure* is a dummy variable that captures the structure of the sustainability commitment. For firms with a diversified (specialized) corporate sustainability structure, it equals one (zero). Also, *CV* is a set of control variables; and $\varepsilon_{i,t}$ is the error term. All the variables are defined below.

The first (second) specification enables us to test hypotheses 1a and 1b (2a and 2b). In the third specification, we consider the joint effect of the level and the structure of corporate sustainability activities. Therefore, it allows us to test hypotheses 3a and 3b.

3.2.1. Firm Cost of Bank Loan Measure and Control Variables

Our measure of a firm's bank loan cost is the DealScan all-in-drawn loan spread. This variable represents the interest rate over the London Interbank Offered Rate (LIBOR) for each loan dollar plus any facility fees paid by the borrower. We build on previous research by using the natural logarithm of this variable as our dependent variable (*Ln(Spread)*).

Following the prior literature (e.g., [11]), we include the borrower and the loan characteristics as the explanatory variables of the corporate loan spread. As the borrower characteristics, we use the following variables: size measured by the logarithm of a firm's total assets; market-to-book ratio; leverage ratio measured by the book value of long-term debt divided by the market value of equity; profitability computed as the ratio of earnings before interest and taxes to total assets; firm risk measured by the Altman's (1968) [22] Z-score; and credit scores provided by the S&P rating dummy which, equals one if the long-term debt has an S&P rating when the signing of the loan contract and zero otherwise.

We consider the following variables for loan characteristics: the natural logarithm of the loan maturity; loan concentration; loan type; and loan purpose. Furthermore, all of our regressions control for the macroeconomic conditions using the 3-month US dollar LIBOR rate at the time of the loan, as well as year and industry fixed effects. We control for industry fixed effects using the 48-industry classification from Fama and French (1997) [23].

3.2.2. Corporate Sustainability Level and Structure

A corporate sustainability commitment covers a large range of sustainability activities, such as those dealing with the environment, community, employee relations, governance, etc. In this study, we refer to the importance of the efforts devoted to such commitment as the firm's sustainability level, while we refer to how this commitment is structured as the corporate sustainability structure.

We obtained the corporate sustainability level and the structure variables using the MSCI ESG STATS CSR strength scores. To define the corporate sustainability level, we add all the strengths of the seven MSCI categories (i.e., community, diversity, employee relations, the environment, product, human rights, and governance.) for each firm-year observation. Then, we create the corporate sustainability level dummy variable *Sus_score*, which equals one (zero) if the firm's total strengths score falls above the industry median for that year.

Also, we define the corporate sustainability structure using the normalized Herfindahl–Hirschman Index (*HHI*). For each firm-year observation, we calculate *HHI* using CSR strength scores as follows:

$$SS_{i,t} = \left(\frac{COM_{i,t}}{Sus_{i,t}}\right)^2 + \left(\frac{DIV_{i,t}}{Sus_{i,t}}\right)^2 + \left(\frac{ENV_{i,t}}{Sus_{i,t}}\right)^2 + \left(\frac{PRO_{i,t}}{Sus_{i,t}}\right)^2 + \left(\frac{HUM_{i,t}}{Sus_{i,t}}\right)^2 + \left(\frac{EMP_{i,t}}{Sus_{i,t}}\right)^2 + \left(\frac{GOV_{i,t}}{Sus_{i,t}}\right)^2 \quad (4)$$

where $SS_{i,t}$ is the sum of the squared ratios of the seven CSR dimensions for firm i in year t; and *COM*, *DIV*, *ENV*, *PRO*, *HUM*, *EMP*, and *GOV* refer to the strength scores of community, diversity, employee relations, the environment, product, human rights, and governance, respectively. $Sus_{i,t}$ is the ith firm's total number of CSR strengths in that year. Then, we calculate:

$$HHI_{i,t} = \frac{SS_{i,t} - 1/7}{1 - 1/7} \quad (5)$$

HHI captures the degree of specialization versus diversification in corporate sustainability activities. *HHI* equals one if a firm uses a single CSR dimension exclusively. Conversely, *HHI* equals zero if a firm relies simultaneously on all seven CSR dimensions in equal proportions.

Next, we create a dummy variable *Sus_structure* to indicate diversified (versus specialized) sustainability structures. *Sus_structure* equals zero (one) if a firm's *HHI* equals one (is below 0.5) for the same year.

4. Empirical Results

4.1. Descriptive Statistics

Table 1 reports the summary statistics for our measures of the bank loan cost, corporate sustainability level, and structure and control variables. The sample consists of 1417 observations and covers the period from 2006 to 2011. The mean (median) of our dependent and key variable *Ln(spread)*, which is the logarithm of the all-in-drawn spread, is 4.853 (5.059). It ranges from a minimum of 2.140 to a maximum of 6.908. These values are consistent with the spreads reported in similar studies in the banking literature, such as Goss and Roberts [11]. The sustainability level (structure) measure *Sus_score* (*Sus_structure*) ranges from one to nineteen (zero to 0.98) with a mean of 3.284 (0.33). This mean for the sustainability structure measure reflects a tendency toward specialization in sustainability activities, as reported in the literature [8]. The remaining control variables are broadly consistent with those reported in similar studies in the literature.

In Table 2, we present the Pearson correlation coefficients among our variables. The corporate sustainability level (structure) is negatively associated with the firm's bank loan cost *Ln(spread)* at the 1% statistical level. All correlations between the cost of a bank loan, *Ln(spread,)* and the control variables are significant at the 1% level, and they have the expected signs (negative for *Concentration*, *ALTZ*, *Market_Book*, *Size*, and *EBIT_TA* and positive for *Maturity* and *Debt_Equity*) based on the prior literature. The obtained

correlations between the independent variables are relatively small. Thus, multicollinearity is not an issue for our analysis.

Table 1. Descriptive statistics.

Variable	N	Mean	Median	SD	Min	Max
Ln(spread)	1417	4.853	5.059	0.908	2.140	6.908
Sus_score	1417	3.284	2.000	3.383	1.000	19.000
Sus_structure	1417	0.331	0.000	0.359	0.000	0.980
Maturity	1417	3.833	4.094	0.578	0.000	5.193
Concentration	1417	−0.017	−0.004	0.044	−0.335	0.000
ALTZ	1417	4.818	4.607	0.740	4.142	15.580
Market_Book	1417	2.685	2.157	6.924	−42.100	51.450
Debt_Equity	1417	0.643	0.286	1.343	0.000	11.370
Size	1417	8.370	8.359	1.450	4.231	11.570
EBIT_TA	1417	0.097	0.089	0.103	−1.658	1.021

This table displays the descriptive statistics of our variables for the whole sample. The mean, median, standard deviation, minimum, and maximum statistics are reported. *Ln(spread)* = the logarithm of the all-in-drawn spread; *Sus_score* = the level of corporate sustainability; *Sus_structure* = the structure of corporate sustainability; *Maturity* = the logarithm of loan maturity in months; *Concentration* = the loan concentration, which is measured as the logarithm of the package amount/(loan package amount + total debt); *ALTZ* = Altman's (1968) Z-score; *Market_Book* = the market-to-book ratio; *Debt_Equity* = the ratio of the book value of long-term debt scaled by the market value of equity; *Size* = the logarithm of total assets; and *EBIT_TA* = the earnings before interest and taxes to total assets. All the continuous variables are winsorized at the first and 99th percentiles.

Table 2. Correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) *Ln(spread)*	1.000									
(2) *Sus_score*	−0.242 ***	1.000								
	(0.000)									
(3) *Sus_structure*	−0.229 ***	0.753 ***	1.000							
	(0.000)	(0.000)								
(4) *Maturity*	0.112 ***	−0.121 ***	−0.125 ***	1.000						
	(0.000)	(0.000)	(0.000)							
(5) *Concentration*	−0.071 ***	0.131 ***	0.122 ***	0.032	1.000					
	(0.001)	(0.000)	(0.000)	(0.150)						
(6) *ALTZ*	−0.205 ***	0.030	0.045 **	−0.020	−0.571 ***	1.000				
	(0.000)	(0.175)	(0.042)	(0.369)	(0.000)					
(7) *Market_Book*	−0.165 ***	0.051 **	0.060 ***	−0.046 **	−0.078 ***	−0.131 ***	1.000			
	(0.000)	(0.021)	(0.006)	(0.037)	(0.000)	(0.000)				
(8) *Debt_Equity*	0.292 ***	−0.110 ***	−0.089 ***	0.038 *	0.128 ***	0.239 ***	−0.054 **	1.000		
	(0.000)	(0.000)	(0.000)	(0.085)	(0.000)	(0.000)	(0.013)			
(9) *Size*	−0.336 ***	0.476 ***	0.450 ***	−0.144 ***	0.360 ***	0.188 ***	0.022	0.023	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.328)	(0.300)		
(10) *EBIT_TA*	−0.282 ***	0.061 ***	0.045 **	0.036 *	−0.106 ***	−0.335 ***	0.149 ***	−0.282 ***	−0.030	1.000
	(0.000)	(0.005)	(0.040)	(0.099)	(0.000)	(0.000)	(0.000)	(0.000)	(0.173)	

This table provides the Pearson correlation coefficients among our variables. All variables are as defined in the notes in Table 1. All the continuous variables are winsorized at the first and 99th percentiles. *p*-values are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 3 reports the means and mean differences of the firm's bank loan cost between different subsamples. In Panel A, the sample is divided into two subsamples based on the corporate sustainability level. When the whole observations are considered, the mean difference is significantly positive at the 1% level. In the second (third) line of Panel A, we provide the results for high (low) quality borrowing firms. The mean difference is significantly positive (negative) at the 1% (5%) level for high (low) quality borrowers. In Panel B (C), the two subsamples are differentiated based on the corporate sustainability structure (level and structure). Except for the low-quality borrowers' subsample in Panel B, all the mean differences findings are comparable to those of Panel A.

The overall findings show that the mean difference is significant and positive for high-quality borrowing firms when considering the corporate sustainability level and the

corporate sustainability structure separately or jointly. These results are consistent with our three hypotheses (1b, 2b, and 3b) based on the risk mitigation view.

Table 3. Mean differences.

Panel A: Sustainability Level			
	Low	High	Mean difference
Whole sample	5.019	4.601	0.418 ***
Unsecured loans	4.556	4.312	0.244 ***
Secured loans	5.340	5.430	−0.090 **
Panel B: Sustainability Structure			
	Specialized	Diversified	Mean difference
Whole sample	5.033	4.669	0.364 ***
Unsecured loans	4.531	4.375	0.156 **
Secured loans	5.355	5.389	−0.034
Panel C: Sustainability Level and Structure			
	Low & Specialized	High & diversified	Mean difference
Whole sample	5.032	4.555	0.477 ***
Unsecured loans	4.533	4.300	0.233 ***
Secured loans	5.351	5.451	−0.100 **

This table provides the means and means differences of the firm's loan cost variable between different subsamples. All variables are as defined in the notes in Table 1. All the continuous variables are winsorized at first and 99th percentiles. *** and ** indicate significance at 1% and 5%, respectively.

4.2. Multivariate Regressions

We now use multivariate analysis to examine whether the corporate sustainability level and structure, separately and jointly, affect a firm's bank loan cost. Table 4 presents the fixed effects ordinary least squares (OLS) regression results of Equation (1) (columns 2, 3, and 4) and Equation (2) (columns 5, 6, and 7) where the corporate sustainability level (*Sus_score*) and structure (*Sus_structure*) are respectively and separately used.

In addition, we follow the previous literature and control for a set of borrowers and loan characteristics in all models. Specifically, we include the following borrower characteristics: size, market-to-book ratio, leverage ratio, profitability, Altman's (1968) Z-score, and the S&P rating dummy. Furthermore, we control for these loan characteristics: loan maturity, loan concentration, loan type, and loan purpose. In all our regressions, we additionally control for the 3-month US dollar LIBOR rate at the time of the loan and for year and industry-fixed effects.

To test hypotheses 1a and 1b, we regress Equation (1) using the whole sample (column 2), the low-quality (column 3), and the high-quality borrowers' (column 3) subsamples. Following the approach in the literature (e.g., [11,15]), we use offering security in a loan contract as an indicator of the borrower's quality. Therefore, a secured (an unsecured) loan indicates a low (high) quality borrower.

The coefficient of interest in Equation (1) is α_1. It captures the effect of corporate sustainability level on a firm's cost of a bank loan. This coefficient is negative (favourable) and significant at the 1% level for the whole sample. When the sample is split into low versus high-quality borrowers' subsamples, the significant and negative effect is found only for high-quality firms; as predicted in our hypothesis 1b, considering the risk mitigation view.

Next, we regress Equation (2) using the whole sample (column 5), the low-quality borrowers' subsamples (column 6), and the high-quality borrowers' subsamples (column 7) to test our hypotheses 2a and 2b. The coefficient of interest α_1 estimates the impact of a diversified corporate sustainability structure on a firm's bank loan cost.

Similar to the previous results in columns 2, 3, and 4, these findings show that although the diversified corporate sustainability structure significantly and negatively affects the cost

of a bank loan in the whole sample, this effect prevails only among high-quality borrowers. This result supports our expectation in hypothesis 2b, considering the risk mitigation view.

Table 4. Multivariate regressions: the separate effects of the corporate sustainability level and structure.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	All Obs	Low Quality	High Quality	All Obs	Low Quality	High Quality
Sus_score	−0.090 ***	−0.004	−0.117 **			
	(0.003)	(0.903)	(0.010)			
Sus_structure				−0.095 ***	−0.055	−0.117 **
				(0.002)	(0.117)	(0.013)
Maturity	0.039	0.154 **	−0.075	0.031	0.142 *	−0.085
	(0.343)	(0.047)	(0.183)	(0.453)	(0.065)	(0.129)
Concentration	−1.552 ***	−1.156 **	−2.050 ***	−1.505 ***	−1.142 **	−1.901 ***
	(0.000)	(0.013)	(0.004)	(0.000)	(0.015)	(0.009)
ALTZ	−0.119 ***	−0.081 **	−0.065	−0.115 ***	−0.081 **	−0.053
	(0.000)	(0.015)	(0.111)	(0.000)	(0.017)	(0.223)
Market_Book	−0.006 ***	−0.003	−0.008 ***	−0.006 ***	−0.003	−0.008 ***
	(0.002)	(0.224)	(0.001)	(0.001)	(0.233)	(0.001)
Debt_Equity	0.062 ***	0.046 ***	0.265 ***	0.059 ***	0.044 ***	0.251 ***
	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)	(0.004)
EBIT_TA	−0.771 ***	−0.663 ***	−1.249 ***	−0.796 ***	−0.681 ***	−1.378 ***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
LIBOR	−0.001	−0.054	0.073	−0.001	−0.061	0.094
	(0.987)	(0.330)	(0.468)	(0.989)	(0.284)	(0.344)
Syndicated	0.162	0.049	−0.000	0.173	0.047	−0.002
	(0.401)	(0.847)	(0.999)	(0.364)	(0.848)	(0.995)
Size	−0.115 ***	−0.076 ***	−0.145 ***	−0.117 ***	−0.072 ***	−0.151 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Secured	0.521 ***			0.511 ***		
	(0.000)			(0.000)		
SP_rat	−0.078 **	−0.132 ***	0.025	−0.080 **	−0.131 ***	0.016
	(0.023)	(0.001)	(0.685)	(0.022)	(0.001)	(0.800)
Constant	5.400 ***	5.513 ***	5.513 ***	5.428 ***	5.560 ***	5.447 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1417	801	616	1373	777	596
R-squared	0.668	0.436	0.700	0.665	0.438	0.695
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the fixed effects OLS regressions results of the separate effects of the corporate sustainability level and structure on the firm's loan cost. The dependent variable is the firm's loan cost (*Ln(spread)*) measured by the logarithm of the all-in-drawn spread. *Sus_score* = the level of corporate sustainability (high versus low); *Sus_structure* = the structure of corporate sustainability (diversified versus specialized); *Maturity* = the logarithm of loan maturity in months; *Concentration* = the loan concentration, which is measured as the logarithm of the package amount/(loan package amount + total debt); *ALTZ = Altman's (1968) Z-score; Market_Book* = the market-to-book ratio; *Debt_Equity* = the ratio of the book value of long-term debt scaled by the market value of equity; *Size* = the logarithm of total assets; and *EBIT_TA* = the earnings before interest and taxes to total assets. All regressions control for industry and year-fixed effects. Heteroskedasticity-consistent standard errors are clustered at the firm level. All the continuous variables are winsorized at the first and 99th percentiles. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Overall, the findings in Table 4 provide evidence that high-quality borrowers with a high level and diversified structure of sustainability activities benefit from lower bank loan costs.

For further insight, we test hypotheses 3a and 3b using Equation (3), where the interaction term α_3 captures the joint effect of the corporate sustainability level (*Sus_score*) and structure (*Sus_structure*) on a firm's cost of a bank loan. A significant and positive (negative) coefficient α_3 means that a high level and diversified structure of corporate sustainability increases (decreases) the cost of a bank loan.

In Table 5, we provide the fixed effects OLS regressions results of Equation (3). Similar to Table 4, we run our regressions on the whole sample (column 2) and the low-quality (column 3) and high-quality borrowers' (column 4) subsamples. The interaction term is negative and significant at the 5% level for the whole sample. When the sample is split

into low versus high-quality borrowers' subsamples, the significant and negative impact is found only for high-quality firms, as expected by our hypothesis 3b, considering the risk mitigation view.

Table 5. Multivariate regressions: the joint effects of the corporate sustainability level and structure.

	All Obs	Low Quality	High Quality
Variables	**(1)**	**(2)**	**(3)**
Interaction	−0.191 **	−0.029	−0.276 *
	(0.014)	(0.721)	(0.073)
Sus_structure	−0.016	−0.067	−0.021
	(0.714)	(0.267)	(0.731)
Sus_score	0.081	0.057	0.155
	(0.182)	(0.225)	(0.274)
Maturity	0.028	0.141 *	−0.090
	(0.485)	(0.069)	(0.103)
Concentration	−1.568 ***	−1.144 **	−1.959 ***
	(0.000)	(0.015)	(0.006)
ALTZ	−0.116 ***	−0.082 **	−0.057
	(0.000)	(0.016)	(0.173)
Market_Book	−0.006 ***	−0.003	−0.007 ***
	(0.002)	(0.228)	(0.002)
Debt_Equity	0.060 ***	0.043 ***	0.251 ***
	(0.000)	(0.000)	(0.004)
EBIT_TA	−0.790 ***	−0.680 ***	−1.328 ***
	(0.001)	(0.001)	(0.002)
LIBOR	−0.001	−0.061	0.092
	(0.990)	(0.286)	(0.367)
Syndicated	0.176	0.049	0.019
	(0.347)	(0.845)	(0.934)
Size	−0.114 ***	−0.074 ***	−0.145 ***
	(0.000)	(0.000)	(0.000)
Secured	0.507 ***		
	(0.000)		
SP_rat	−0.085 **	−0.130 ***	0.019
	(0.015)	(0.001)	(0.771)
Constant	5.414 ***	5.583 ***	5.432 ***
	(0.000)	(0.000)	(0.000)
Observations	1373	777	596
R-squared	0.667	0.438	0.698
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes

This table presents the fixed effects OLS regressions results of the joint effects of the corporate sustainability level and structure on the firm's loan cost. The dependent variable is the firm's loan cost (*Ln(spread)*) measured by the logarithm of the all-in-drawn spread. *Sus_score* = the level of corporate sustainability (high versus low); *Sus_structure* = the structure of corporate sustainability (diversified versus specialized); *Interaction* equals *Sus_score* × *Sus_structure*; *Maturity* = the logarithm of loan maturity in months; *Concentration* = the loan concentration, which is measured as the logarithm of the package amount/(loan package amount + total debt); *ALTZ* = *Altman's (1968) Z-score; Market_Book* = the market-to-book ratio; *Debt_Equity* = the ratio of the book value of long-term debt scaled by the market value of equity; *Size* = the logarithm of total assets; and *EBIT_TA* = the earnings before interest and taxes to total assets. All regressions control for industry and year fixed-effects. Heteroskedasticity-consistent standard errors are clustered at the firm level. All the continuous variables are winsorized at the first and 99th percentiles. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Thus, the findings reported in Table 5 show that a high-level and diversified structure of sustainability activities reduce bank loan costs for high-quality borrowers only.

4.3. Robustness Checks

In this section, we subject our earlier findings to additional robustness checks. Specifically, we use alternative measures of the corporate sustainability structure and other control variables.

4.3.1. Alternative Measure of Corporate Sustainability Structure

The normalized entropy is an alternative to the normalized Herfindahl–Hirschman Index (*HHI*) as a measure of the corporate sustainability activities structure t. We calculate the normalized and adjusted *Entropy* to yield the same directional interpretation as the *HHI* index: high (low) values indicate specialization (diversification). *Entropy* is computed for firm i in year t as shown in Equation (6):

$$Entropy_{i,t} = 1 - \left[-\sum_{j=1}^{7} \left(s_{i,j,t} / \sum_{j=1}^{7} s_{i,j,t} \right) * ln \left(s_{i,j,t} / \sum_{j=1}^{7} s_{i,j,t} \right) \right] / \ln(7) \quad (6)$$

where $s_{i,j,t}$ is the ratio of the sustainability dimension j strengths of firm i in year t over the firm's total number of sustainability strengths across all the seven MSCI dimensions in that year ($Sus_{i,j,t}$).

The findings are reported in Table 6. All the findings are qualitatively similar to those reported in Tables 4 and 5. Therefore, all our earlier inferences remain unchanged.

4.3.2. Corporate Sustainability Concerns

For this study, we compute corporate sustainability structures using MSCI ESG strength scores because these scores reflect the efforts and actions undertaken by the firm. The MSCI database also offers concerns scores, which reflect corporate sustainability issues. We subject our earlier findings to a robustness test by integrating these concerns into all our models. We rerun our regressions; the results are reported in Tables 7 and 8. All the findings are qualitatively similar to those reported in Tables 4 and 5. Thus, our earlier inferences remain unchanged.

4.3.3. Difference-in-Differences Regressions

Our earlier results may suffer from an endogeneity issue related to the reverse causality between a firm's sustainability structure and its bank loan cost. We follow the previous literature and use the difference-in-differences (DiD) regressions approach to deal with such an issue. For this, we exploit the 2008 financial crisis as an exogenous shock to the value of corporate sustainability activities [24].

This approach compares the difference in the cost of a bank loan before and after the treatment (i.e., the 2008 financial crisis) for the treated group (i.e., firms with a diversified sustainability structure) with the corresponding difference for the control group (i.e., firms with a specialized sustainability structure). For this, we estimate the following regression equation:

$$Ln(Spread)_{i,t} = \alpha_0 + \alpha_1 Sus\_structure_i * Crisis_t + \alpha_2 Sus\_structure_i + \alpha_3 Crisis_t + \sum_{j=1,m} \alpha_{i+3} CV_{j,t} + \varepsilon_{i,t} \quad (7)$$

where subscripts i and t indicate the firm and period (before and during the 2008 financial crisis), respectively, while j indicates the j'th control variable.

Sus_structure is a dummy variable, which equals one (zero) for firms in the treated (control) group with a diversified (specialized) sustainability structure. We define the *Sus_structure* dummy variable at the end of 2006 following Lins, Servaes et al. [24]. $CV_{j,t}$ is the set of control variables. *Crisis* is a dummy variable indicating the financial crisis shock period. It equals one (zero) for the years 2008 and 2009 (2006), as in Lins, Servaes et al. [24] and Lins, Volpin et al. [25].

Our focus in this equation is on the DiD coefficient α_1. This coefficient captures the average differential variation in the cost of bank loans from the pre-2008 financial crisis to the crisis period of firms in the treated group relative to those in the control group. If the sustainability activities structure affects a firm's bank loan cost, then the difference (α_1)

between firms in the treated and the control groups will be higher during the crisis period than before. Accordingly, the DiD coefficient α_1 is expected to be significant and positive.

Using Equation (7) and the four subsamples that differentiate firms with a low level of sustainability activities from those with a high level of sustainability activities and firms that are high-quality borrowers from low-quality borrowers, we perform DiD regressions. The results are reported in Table 9.

These results show that the DiD coefficient (α_1) is significant and positive only for the subsample of high-quality borrowers with a high level of sustainability activities (model 4). Thus, corporate sustainability activities decrease the cost of a bank loan only for high-quality credit firms with a high level and diversified sustainability commitment. This result confirms our earlier findings, and as a consequence, all our previous inferences continue to hold.

Table 6. Multivariate regressions with the alternative measure of sustainability structure.

	All Obs	Low Quality	High Quality	All Obs	Low Quality	High Quality
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Interaction				−0.310 **	−0.124	−0.419 *
				(0.025)	(0.680)	(0.051)
Sus_structure	−0.139 ***	−0.032	−0.133 **	0.095	0.003	0.109
	(0.002)	(0.520)	(0.036)	(0.423)	(0.991)	(0.542)
Sus_score				0.083	0.066	0.172
				(0.233)	(0.222)	(0.199)
Maturity	0.001	0.161 *	0.007	−0.044	−0.006	−0.146 **
	(0.986)	(0.052)	(0.884)	(0.250)	(0.939)	(0.024)
Concentration	−1.460 ***	−0.814 *	−3.075 ***	−1.438 ***	−0.611	−2.347 **
	(0.001)	(0.072)	(0.001)	(0.002)	(0.218)	(0.039)
ALTZ	−0.124 ***	−0.060 **	−0.119 **	−0.114 ***	−0.064 **	−0.088
	(0.000)	(0.040)	(0.019)	(0.000)	(0.034)	(0.122)
Market_Book	−0.010 ***	−0.003	−0.010 ***	−0.009 ***	−0.002	−0.011 ***
	(0.000)	(0.232)	(0.000)	(0.000)	(0.360)	(0.006)
Debt_Equity	0.060 ***	0.045 ***	0.234 ***	0.055 ***	0.044 ***	0.215 ***
	(0.000)	(0.000)	(0.009)	(0.000)	(0.000)	(0.001)
EBIT_TA	−0.791 ***	−0.606 ***	−1.325 ***	−0.814 ***	−0.725 ***	−1.490 ***
	(0.002)	(0.003)	(0.008)	(0.000)	(0.001)	(0.001)
LIBOR	−0.173 ***	−0.042	0.137	−0.175 ***	−0.115 ***	−0.243 ***
	(0.000)	(0.519)	(0.229)	(0.000)	(0.000)	(0.000)
Syndicated	−0.113	0.012	−0.202	−0.060	0.045	−0.172
	(0.619)	(0.968)	(0.461)	(0.726)	(0.884)	(0.466)
Size	−0.129 ***	−0.062 ***	−0.161 ***	−0.132 ***	−0.093 ***	−0.166 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Secured	0.552 ***			0.517 ***		
	(0.000)			(0.000)		
SP_rat	−0.120 ***	−0.132 ***	−0.024	−0.125 ***	−0.144 ***	−0.052
	(0.003)	(0.002)	(0.768)	(0.004)	(0.001)	(0.565)
Constant	6.925 ***	5.340 ***	5.580 ***	7.038 ***	6.580 ***	8.000 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1373	777	596	1373	777	596
R−squared	0.592	0.371	0.660	0.618	0.354	0.615
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the fixed effects OLS regressions results of the effects of the corporate sustainability level and structure on the firm's loan cost. The dependent variable is the firm's loan cost (*Ln(spread)*) measured by the logarithm of the all-in-drawn spread. *Sus_score* = the level of corporate sustainability (high versus low); *Sus_structure* = the structure of corporate sustainability (diversified versus specialized) measured based on *Entropy* instead of on the *HHI*; *Interaction* = *Sus_score* × *Sus_structure*; *Maturity* = the logarithm of loan maturity in months; *Concentration* = the loan concentration, which is measured as the logarithm of the package amount/(loan package amount + total debt); *ALTZ* = *Altman's (1968) Z-score; Market_Book* = the market-to-book ratio; *Debt_Equity* = the ratio of the book value of long-term debt scaled by the market value of equity; *Size* = the logarithm of total assets; and *EBIT_TA* = the earnings before interest and taxes to total assets. All regressions control for industry and year-fixed effects. Heteroskedasticity-consistent standard errors are clustered at the firm level. All the continuous variables are winsorized at the first and 99th percentiles. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Multivariate regressions: the separate effects of a corporate sustainability level and structure with control for sustainability concerns.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	All Obs	**Low Quality**	**High Quality**	**All Obs**	**Low Quality**	**High Quality**
Sus_score	−0.090 ***	−0.005	−0.116 **			
	(0.003)	(0.884)	(0.012)			
Sus_structure				−0.095 ***	−0.056	−0.116 **
				(0.002)	(0.116)	(0.013)
Maturity	0.036	0.148 *	−0.076	0.028	0.134 *	−0.087
	(0.376)	(0.055)	(0.174)	(0.498)	(0.079)	(0.120)
Concentration	−1.570 ***	−1.154 **	−1.928 ***	−1.527 ***	−1.137 **	−1.763 **
	(0.000)	(0.014)	(0.008)	(0.000)	(0.016)	(0.016)
ALTZ	−0.120 ***	−0.082 **	−0.058	−0.117 ***	−0.082 **	−0.044
	(0.000)	(0.015)	(0.165)	(0.000)	(0.017)	(0.311)
Market_Book	−0.006 ***	−0.003	−0.007 ***	−0.007 ***	−0.003	−0.008 ***
	(0.001)	(0.210)	(0.001)	(0.001)	(0.210)	(0.001)
Debt_Equity	0.062 ***	0.046 ***	0.261 ***	0.060 ***	0.044 ***	0.246 ***
	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)	(0.005)
EBIT_TA	−0.765 ***	−0.663 ***	−1.302 ***	−0.788 ***	−0.678 ***	−1.434 ***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
LIBOR	0.003	−0.051	0.067	0.004	−0.056	0.087
	(0.963)	(0.364)	(0.496)	(0.949)	(0.322)	(0.376)
Syndicated	0.165	0.051	−0.004	0.176	0.050	−0.006
	(0.394)	(0.835)	(0.986)	(0.354)	(0.831)	(0.980)
Size	−0.107 ***	−0.067 ***	−0.158 ***	−0.107 ***	−0.061 ***	−0.166 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Secured	0.525 ***			0.515 ***		
	(0.000)			(0.000)		
SP_rat	−0.078 **	−0.132 ***	0.021	−0.079 **	−0.130 ***	0.012
	(0.023)	(0.001)	(0.732)	(0.023)	(0.001)	(0.848)
Sus_concerns	−0.008	−0.009	0.010	−0.009	−0.012	0.012
	(0.289)	(0.272)	(0.324)	(0.211)	(0.158)	(0.269)
Constant	5.351 ***	5.474 ***	5.605 ***	5.368 ***	5.509 ***	5.555 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1417	801	616	1373	777	596
R−squared	0.669	0.437	0.700	0.666	0.439	0.696
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the fixed effects OLS regressions results of the separate effects of the corporate sustainability level and structure on the firm's loan cost while controlling for corporate sustainability concerns. The dependent variable is the firm's loan cost (*Ln(spread)*) measured by the logarithm of the all-in-drawn spread; *Sus_score* = the level of corporate sustainability (high versus low); *Sus_structure* = the structure of corporate sustainability (diversified versus specialized); *Maturity* = the logarithm of loan maturity in months; *Concentration* = the loan concentration measured as the logarithm of the package amount/(loan package amount + total debt); *ALTZ* = *Altman's (1968) Z-score; Market_Book* = the market-to-book ratio; *Debt_Equity* = the ratio of the book value of long-term debt scaled by the market value of equity; *Size* = the logarithm of total assets; *EBIT_TA* = the earnings before interest and taxes to total assets; and *Sus_ concerns* = MSCI sustainability concerns scores. All regressions control for industry and year-fixed effects. Heteroskedasticity-consistent standard errors are clustered at the firm level. All the continuous variables are winsorized at the first and 99th percentiles. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 8. Multivariate regressions: the joint effects of a corporate sustainability level and structure with control for sustainability concerns.

	All Obs	**Low Quality**	**High Quality**
Variables	**(1)**	**(2)**	**(3)**
Interaction	−0.193 **	−0.033	−0.273 *
	(0.013)	(0.690)	(0.078)
Sus_structure	−0.015	−0.065	−0.023
	(0.743)	(0.285)	(0.715)
Sus_score	0.081	0.057	0.154
	(0.186)	(0.232)	(0.278)
Maturity	0.025	0.133 *	−0.092 *
	(0.537)	(0.085)	(0.095)
Concentration	−1.593 ***	−1.140 **	−1.831 **
	(0.000)	(0.016)	(0.011)
ALTZ	−0.118 ***	−0.082 **	−0.049
	(0.000)	(0.016)	(0.247)
Market_Book	−0.006 ***	−0.003	−0.007 ***
	(0.002)	(0.206)	(0.002)
Debt_Equity	0.061 ***	0.044 ***	0.247 ***
	(0.000)	(0.000)	(0.004)
EBIT_TA	−0.782 ***	−0.678 ***	−1.381 ***
	(0.001)	(0.001)	(0.001)
LIBOR	0.004	−0.056	0.086
	(0.945)	(0.325)	(0.395)
Syndicated	0.180	0.051	0.014
	(0.336)	(0.829)	(0.950)
Size	−0.103 ***	−0.062 ***	−0.159 ***
	(0.000)	(0.001)	(0.000)
Secured	0.511 ***		
	(0.000)		
SP_rat	−0.084 **	−0.129 ***	0.015
	(0.015)	(0.001)	(0.816)
Sus_concerns	−0.010	−0.012	0.011
	(0.185)	(0.172)	(0.316)
Constant	5.350 ***	5.531 ***	5.531 ***
	(0.000)	(0.000)	(0.000)
Observations	1373	777	596
R-squared	0.668	0.440	0.699
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes

This table presents the fixed effects OLS regressions results of the joint effects of the corporate sustainability level and structure on the firm's loan cost. The dependent variable is the firm's loan cost (*Ln(spread)*) measured by the logarithm of the all-in-drawn spread; *Sus_score* = the level of corporate sustainability (high versus low); *Sus_structure* = the structure of corporate sustainability (diversified versus specialized); *Interaction* = *Sus_score* × *Sus_structure*; *Maturity* = the logarithm of loan maturity in months; *Concentration* = the loan concentration measured as the logarithm of the package amount/(loan package amount + total debt); *ALTZ* = *Altman's (1968) Z-score; Market_Book* = the market-to-book ratio; *Debt_Equity* = the ratio of the book value of long-term debt scaled by the market value of equity; *Size* = the logarithm of total assets; *EBIT_TA* = the earnings before interest and taxes to total assets; and *Sus_ concerns* = the MSCI sustainability concerns scores. All regressions control for industry and year-fixed effects. Heteroskedasticity-consistent standard errors are clustered at the firm level. All the continuous variables are winsorized at the first and 99th percentiles. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 9. Difference-in-differences regressions.

	(1)	(2)	(3)	(4)
	Low Quality Borrower		**High Quality Borrower**	
Variables	**Low Level of Sustainability**	**High Level of Sustainability**	**Low Level of Sustainability**	**High Level of Sustainability**
Sus_structure × *Crisis*	−0.4435	0.5111	0.4036	0.9248 *
	(0.668)	(0.302)	(0.419)	(0.058)
Sus_structure	0.4834	−0.6333	−0.3442	−0.7436
	(0.602)	(0.219)	(0.365)	(0.107)
Crisis	−0.6708	−1.2446 **	−0.7114	−1.7955 ***
	(0.358)	(0.011)	(0.155)	(0.003)
Maturity	0.0312	0.0863	0.2023	−0.0524
	(0.861)	(0.559)	(0.381)	(0.849)
Concentration	−2.2299	−2.9269	−4.3108	−0.6116
	(0.353)	(0.160)	(0.637)	(0.980)
ALTZ	0.2481	0.2405	−0.6829	−0.9674
	(0.303)	(0.204)	(0.217)	(0.106)
Market_Book	0.0660	0.0779	−0.0231	−0.0358
	(0.344)	(0.173)	(0.408)	(0.552)
Debt_Equity	0.1754	0.3535 **	0.1085	0.1823
	(0.474)	(0.039)	(0.198)	(0.261)
EBIT_TA	−5.1125 **	−5.1045 **	−1.1512	−1.6962
	(0.042)	(0.011)	(0.471)	(0.110)
LIBOR	−0.3227	−0.4856 ***	−0.3789 ***	−0.4489 ***
	(0.128)	(0.001)	(0.004)	(0.000)
Size	−0.3337	−0.4786 **	−0.1274	−0.1431
	(0.230)	(0.014)	(0.249)	(0.268)
Constant	7.1384 ***	8.5617 ***	10.0851 ***	13.2059 ***
	(0.009)	(0.000)	(0.003)	(0.000)
Observations	48	58	82	80
R-squared	0.765	0.792	0.810	0.852
Industry FE	YES	YES	YES	YES

This table presents difference-in-differences regressions results. The dependent variable is the firm's loan cost (*Ln(spread)*) measured by the logarithm of the all-in-drawn spread. *Sus_structure* = the structure of corporate sustainability (diversified versus specialized); *Crisis* = a dummy variable indicating the 2008 financial crisis period; *Maturity* = the logarithm of loan maturity in months; *Concentration* = the loan concentration measured as the logarithm of the package amount/(loan package amount + total debt); *ALTZ* = *Altman's (1968) Z-score; Market_Book* = the market-to-book ratio; *Debt_Equity* = the ratio of the book value of long-term debt scaled by the market value of equity; *Size* = the logarithm of total assets; *EBIT_TA* = the earnings before interest and taxes to total assets; and *Sus_ concerns* = the MSCI sustainability concerns scores. All regressions control for industry membership. Heteroskedasticity-consistent standard errors are clustered at the firm level. All the continuous variables are winsorized at the first and 99th percentiles. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

5. Discussion and Conclusions

This paper examined the separate and joint effects of the corporate sustainability level and structure on a firm's cost of a bank loan. We tested our predictions using a U.S. dataset of 1417 bank loan facilities in the United States. Our analysis provides evidence of three main results.

First, we found that a high level of corporate sustainability decreases the cost of a bank loan for high-quality borrowers. This finding supports the theoretical argument of the risk mitigation effect of a firm's sustainability commitment. Furthermore, it is consistent with the findings of the broad literature that link sustainability activities to corporate performance (e.g., [24,26,27]). More specifically, our result supports the previous empirical literature findings that link corporate sustainability to the cost of debt (e.g., [11,16–20]). For instance, Kim et al. [28] show that firms' ethical behavior reduces bank loan interest rates. Also, Kordsachia [29] and La Rosa et al. [30] find that CSR decreases the credit costs

of European firms. Using bond market data, Oikonomou et al. [18] find that good social performance reduces corporate yield spreads. Similarly, Ge and Liu [19] show that better CSR performance is associated with lower bond yield spreads, and higher CSR strengths (concerns) are associated with lower (higher) bond yield spreads.

Second, we found evidence that a diversified structure of corporate sustainability decreases the cost of a bank loan for high-quality borrowers. This result supports the stakeholders' theory prediction and is consistent with the literature that explores the financial consequences of heterogeneity in corporate sustainability commitment. In particular, it is consistent with the studies of Seo et al. [7] and Bouslah et al. [8]. Seo et al. [7] find that diversification across causes in donations by large U.S. corporations is more beneficial ragarding firm profitability. Similarly, Bouslah et al. [8] findings show a positive effect of diversified CSR structures on firm value relative to firms in the control group with focused CSR structures.

Third, and more importantly, we found evidence that the decreasing effect of corporate sustainability on a firm's bank loan cost prevails only for high-quality borrowers with a high-level and diversified structure of sustainability initiatives. This finding is consistent with the literature linking corporate sustainability to the cost of debt (e.g., [11,16–20]) and the literature investigating the value consequences of the heterogeneity in corporate sustainability engagement. Our study contributes to these two streams in the literature by exploring the joint effects of corporate sustainability level and structure and by showing the conditions under which the effect exists (i.e., the high level and diversified sustainability activities of high-quality borrowers).

Overall, our findings reveal that lenders seem to restrict their positive valuation of corporate sustainability commitment to high-quality borrowers and that only a higher level of engagement in sustainable activities dealing with a wide range of stakeholders' issues is considered in this valuation. These findings have important and practical implications for the managers of firms that want to benefit from corporate sustainability commitments in their bank loan financing. While previous studies reveal that U.S. firms generally tend to use focused sustainability structures [8], our study shows that only a high-level and diversified structure of corporate sustainability for high-quality borrowers have a decreasing effect on the cost of bank loans.

Although this study provides useful findings, it has some limitations that deserve future research investigations. For instance, our results show a significant negative differential effect on the cost of a bank loan of diversification relative to specialization in corporate sustainability structures. This is an average effect, and it does not necessarily mean that diversified sustainability structures dominate specialized ones in all cases. Some previous studies provide situations where a specialized structure in corporate sustainability is more valuable [31,32]. Therefore, it might be interesting to closely examine the effects of specific specialized structures in corporate sustainability. A specialized structure may focus on one or more sustainability domains, such as community, employee relations, the environment, product, diversity, human rights, and governance. Also, it might be interesting for future research to use other corporate sustainability scores and extend the investigation to more recent data and an international context.

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References

1. Deloitte. The Rise of the Socially Responsible Business. 2019. Available online: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/deloitte-global-societal-impact-pulse-survey-report-jan-2019.pdf. (accessed on 28 December 2022).
2. Wang, H.; Choi, J. A new look at the corporate social-financial performance relationship: The moderating roles of temporal and interdomain consistency in corporate social performance. *J. Manag.* **2010**, *39*, 416–441. [CrossRef]
3. Brower, J.; Mahajan, V. Driven to be good: A stakeholder theory perspective on the drivers of corporate social performance. *J. Bus. Ethics* **2013**, *117*, 313–331. [CrossRef]
4. Mazutis, D. The CEO effect: A longitudinal, multilevel analysis of the relationship between executive orientation and corporate social strategy. *Bus. Soc.* **2013**, *52*, 631–648. [CrossRef]
5. Fu, L.; Boehe, D.; Orlitzky, M.; Swanson, D.L. Managing stakeholder pressures: Toward a typology of corporate social performance profiles. *Long Range Plann.* **2019**, *52*, 101847. [CrossRef]
6. Zhang, Y.; Wang, H.; Zhou, X. Dare to be different? Conformity versus differentiation in corporate social activities of Chinese firms and market responses. *Acad. Manag. J.* **2020**, *63*, 717–742. [CrossRef]
7. Seo, H.; Luo, J.; Kaul, A. Giving a little to many or a lot to a few? The returns to variety in corporate philanthropy. *Strateg. Manag. J.* **2021**, *4*, 1–31. [CrossRef]
8. Bouslah, K.; Hmaittane, A.; Kryzanowski, L.; M'Zali, B. CSR structures: Evidence, drivers and firm-value implications. *J. Bus. Ethics* **2022**, 1–31. [CrossRef]
9. Cespa, G.; Cestone, G. Corporate social responsibility and managerial entrenchment. *J. Econ. Manag. Strateg.* **2007**, *16*, 741–771. [CrossRef]
10. Barnea, A.; Rubin, A. Corporate social responsibility as a conflict between shareholders. *J. Bus. Ethics* **2010**, *97*, 71–86. [CrossRef]
11. Goss, A.; Roberts, G.S. The impact of corporate social responsibility on the cost of bank loans. *J. Bank. Financ.* **2011**, *35*, 1794–1810. [CrossRef]
12. Godfrey, P.C. The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Acad. Manag. Rev.* **2005**, *30*, 777–798. [CrossRef]
13. El Ghoul, S.; Guedhami, O.; Kwok, C.; Mishra, D. Does corporate social responsibility affect the cost of capital? *J. Bank. Financ.* **2011**, *35*, 2388–2406. [CrossRef]
14. Attig, N.; Boubakri, N.; El Ghoul, S.; Guedhami, O. Firm internationalization and corporate social responsibility. *J. Bus. Ethics* **2016**, *34*, 171–197. [CrossRef]
15. Booth, J.; Booth, L.C. Loan collateral decisions and corporate borrowing costs. *J. Money Credit Bank.* **2006**, *38*, 67–90. [CrossRef]
16. Chava, S. Environmental externalities and cost of capital. *Manag. Sci.* **2014**, *60*, 2223–2247. [CrossRef]
17. Amiraslani, H.; Lins, K.; Servaes, H.; Tamayo, A. A matter of trust? The bond market benefits of corporate social capital during the financial crisis. CEPR Discussion Paper No DP12321. 2017. Available online: https://ssrn.com/abstract=3042634 (accessed on 28 December 2022).
18. Oikonomou, I.; Brooks, C.; Pavelin, S. The effects of corporate social performance on the cost of corporate debt and credit ratings. *Financ. Rev.* **2014**, *49*, 49–75. [CrossRef]
19. Ge, W.; Liu, M. Corporate social responsibility and the cost of corporate bonds. *J. Account. Public Policy* **2015**, *34*, 597–624. [CrossRef]
20. Jang, G.Y.; Kang, H.G.; Lee, J.Y.; Bae, K. ESG scores and the credit market. *Sustainability* **2020**, *12*, 3456. [CrossRef]
21. Akpinar, A.; Jiang, Y.; Gomes-Mejia, L.R.; Berrone, P.; Walls, J.L. Strategic use of CSR as a signal for good management. *IE Bus. Sch. Work. Pap.* **2008**, WP08-25. [CrossRef]
22. Altman, E. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *J. Financ.* **1968**, *23*, 589–609. [CrossRef]
23. Fama, E.F.; French, K.R. Industry cost of equity. *J. Financ. Econ.* **1997**, *43*, 153–193. [CrossRef]
24. Lins, K.V.; Servaes, H.; Tamayo, A. Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *J. Financ.* **2017**, *72*, 1785–1824. [CrossRef]
25. Lins, K.V.; Volpin, P.; Wagner, H. Does family control matter? International evidence from the 2088–2009 financial crisis. *Rev. Financ. Stud.* **2013**, *26*, 2583–2619. [CrossRef]
26. Margolis, J.; Elfenbein, H.; Walsh, J. Does it pay to be good...and does it matter? A meta-analysis of the relationship between corporate social and financial performance. *SSRN Electron. J.* **2009**. [CrossRef]
27. Avram, A.; Nicolescu, A.C.; Avram, C.D.; Dan, R.L. Financial communication in the context of corporate social responsibility Growth. *Amfiteatru Econ.* **2019**, *21*, 623–638. [CrossRef]
28. Kim, M.; Surroca, J.; Tribó, J.A. Impact of ethical behavior on syndicated loan rates. *J. Bank. Financ.* **2014**, *38*, 122–144. [CrossRef]

29. Kordsachia, O. A risk management perspective on CSR and the marginal cost of debt: Empirical evidence from Europe. *Rev. Manag. Sci.* **2021**, *15*, 1611–1643. [CrossRef]
30. La Rosa, F.; Liberatore, G.; Mazzi, F.; Terzani, S. The impact of corporate social performance on the cost of debt and access to debt financing for listed European non-financial firms. *Eur. Manag. J.* **2018**, *36*, 519–529. [CrossRef]
31. Tang, Z.; Hull, C.E.; Rothenberg, A. How corporate social responsibility engagement strategy moderates the CSR-financial performance relationship. *J. Manag. Stud.* **2012**, *49*, 1274–1303. [CrossRef]
32. Cavaco, S.; Crifo, P. CSR and financial performance: Complementarity between environmental, social and business behaviours. *Appl. Econ.* **2014**, *46*, 3323–3338. [CrossRef]