

The Cost of Debt and Its Economic and Financial Drivers: An Empirical Study of European Companies

Anna Maria Calce¹

¹ Department of Economics and Law, University of Cassino and Southern Lazio, Cassino, Italy

Correspondence: Anna Maria Calce, Department of Economics and Law, University of Cassino and Southern Lazio, Cassino, FR 03043, Italy. E-mail: annamariacalce@unicas.it

Received: July 13, 2025

Accepted: July 30, 2025

Online Published: July 31, 2025

doi:10.5539/ijef.v17n8p160

URL: <https://doi.org/10.5539/ijef.v17n8p160>

Abstract

This study aims to define the relationship between the cost of debt and firm financial performance measures. To this end, a multiple linear regression model has been applied on a sample of European companies issuing bonds traded on Euronext. The analysis considers data relating to the period 2019-2023. Specifically, the work tests the impact of measures concerning company size, liquidity, solidity and profitability on the yield to maturity. The independent variables are the following: net working capital to total assets ratio, return on assets, logarithm of revenues, leverage, interest coverage ratio, current ratio and the coefficients of variation of operating profit and net income. Consistent with the literature on this topic, size has a significant and inverse impact on the cost of debt. For the other variables, the regression also returns coefficients in line with expectations. The resulting model allows for estimating the cost of debt by applying the coefficients to a company's financial data. Even if the company is not publicly traded, the relationship returns a measure of its debt capital cost. This study contributes to the research on the cost of debt, a central topic in corporate finance. It also provides practical implications for corporate management by raising awareness of the drivers that influence the cost of debt capital and offering the opportunity to optimize financial decisions.

Keywords: cost of debt, cost of capital, corporate bonds, financial performance, European companies

1. Introduction

The cost of debt refers to the cost of borrowing funds, reflects the current level of interest rates and the perceived risk of default according to investors (Kumar, 2015; Arnaboldi et al., 2014; Derrien et al., 2016; Wang et al., 2020; DePamphilis, 2019). It is one of the factors that contribute to the calculation of the Weighted Average Cost of Capital (WACC). Its determination is easy for listed companies given the higher level of transparency to which they are subjected due to having direct access to the financial markets. Listed companies generally have a credit rating provided by specialized agencies, which allows them to quantify the default risk associated with their debt and enables a more accurate estimate of the expected cost of debt. Given their listing and the transparency obligations to which issuers are subject, the interest rates on their debt instruments (bonds or bond loans) are public and observable on the market with the consequent possibility of calculating an effective rate of the outstanding debt.

One of the first models developed to determine the cost of debt for listed companies is attributed to Merton (1974); the author highlights how the value linked to the issue of corporate debt is the reflection of three factors that act together. These are the rate of return required on risk-free debt securities, the conditions underlying the issue (maturity, coupon rate, repayment conditions) and the probability of default. The model derived from the Black-Scholes model (1973) cannot be easily extended to unlisted companies given the unavailability of market variables for the latter. Most of the studies in the literature hypothesize a link between corporate bonds and the cost of debt and aim to identify a rating on the basis of which to estimate the cost of debt (Intrigano et al., 2016; Kliger & Sarig, 2000). Assessing the cost of debt in unlisted companies can be particularly complicated, given the absence of debt instruments traded on the market and the lack of financial data available to the public.

To overcome this limitation, it is common to use comparable entities (benchmarking against comparable firms). This is based on the belief that unlisted companies, despite not having their own debt instruments traded on the markets, have a financial profile that can be compared with that of their listed peers operating in the same sector. On these assumptions, it is possible to derive a measure of the cost of debt for unlisted companies starting from

the yields of debt securities of listed companies, making the necessary corrections to take into account differences in credit risk, capital structure and company size. Another equally widespread approach involves the use of the risk-free rate to which a quantity (called the default spread) is added. The risk-free rate, represented by the yield of government bonds, is the basic component in determining the cost of debt, while the default spread reflects the greater risk associated with loans to the unlisted company. The spread is often derived from historical default rates or sector-specific risk premiums. In the absence of market-based estimates, it is fairly typical to observe the use of financial parameters such as interest coverage ratios (ICR) or the ratios between total interest expense and average interest-bearing liabilities, considered valid proxies of the risk profile of unlisted companies (Francis et al., 2005; Stanišić et al., 2016).

In this work, following the existing literature, we identify the relationship between the cost of debt for unlisted companies, and accounting quantities. The result obtained can be used to estimate the cost of debt: by multiplying the coefficients by the accounting figures of a given company, even if unlisted, the mathematical relationship returns the measure of the relative cost of debt capital. The structure of the paper is as follows: the second section focuses on the analysis of the literature concerning the cost of debt estimation; the third section describes the methodology used to derive the relationship between the cost of debt and accounting measures; the fourth paragraph describes the results obtained; the fifth illustrates conclusions and implications and the last paragraph reports the limitations and suggestions for future research.

2. Literature Review

2.1 First Studies

According to different authors the cost of corporate bond is a proxy of cost of debt (Fisher, 1959; Merton, 1974; Bierman & Hass, 1975; Chen, 1978; Boardman & McEnally, 1981; Briys & de Varenne, 1997). A common feature is the presence of the probability of default measured through the rating and considered of absolute relevance in the definition of the cost of debt. In addition, there is a frequent attempt to link the cost of debt to accounting and market measures. Fisher (1959) highlights three key factors that influence the likelihood of a company defaulting on its obligations: the variation of net income over the last nine years as a proxy of the volatility of earnings, the degree of financial leverage, reflected in the ratio of the company's market value of equity to its book value of debt, and the duration for which the company has been active without causing losses to its creditors.

Chen (1978) suggests that a company's debt cost depends on several factors: the baseline interest rate with no risk, how exposed the company is to market-wide risks, the likelihood it may go bankrupt, the applicable corporate tax rate and the potential costs involved if bankruptcy occurs. He aims to link the expected yield of a risky bond to both the regular market-related risk of its cash flows and the possibility of default.

2.2 Accounting Indicators and Ratings: Theoretical Approaches and Empirical Models

Horrigan (1966) try to investigate the predictive power of financial ratios for corporate bond rating. The selected financial ratios belong to the area of liquidity and profitability and are represented by total assets, working capital to sales ratio, shareholders' funds to total debt, sales to shareholders' funds.

These were followed by further studies over time which helped to maintain high attention on the topic. The model developed by Pogue and Soldofsky (1969) identifies the long-term debt to total assets ratio, the coefficient of earnings variation and total assets as variables that impact the rating. Conversely, ROA appears to be statistically insignificant. Cannata (2001) identifies the existence of a relationship between bond ratings and accounting variables representative of solvency, financial structure, and profitability. For the first group, the author selects the cash flow to total debt ratio, the quick ratio and the current ratio. For the second group, the model includes the debt ratio and financial leverage. For the third area, ROE, ROI, and ROA are considered. The sample consists of companies from the United States, the United Kingdom, France, Germany and Italy. The author concludes that all indicators are statistically significant with the sole exceptions being the interest coverage ratio, the liquidity ratio and ROA.

Unlike the models presented so far, Damodaran (2011) suggests a more simplified approach to rating determination, based on a single accounting-derived variable: the interest coverage ratio. The author associates the interest coverage ratio with a rating and a default spread. The spread is added to the risk-free rate (e.g., government bond yield) to obtain the pre-tax cost of debt. This topic has always attracted the attention of researchers who have questioned the ability of performance measures to influence the cost of debt.

2.3 Economic and Financial Measures and Yield to Maturity

Some studies highlight how the yield to maturity (YTM), which reflects the implicit rate that the company pays

on its bond debt and for this reason is used as an estimate of the pre-tax cost of debt, is influenced by specific economic and financial variables. The most investigated measures are those that have a direct or indirect relation to credit risk. Among these, variables such as size, financial leverage, ownership structure, and the quality of financial reporting systems are particularly recurrent (Anderson et al., 2003; Anderson et al., 2004; Francis et al., 2005; Sánchez-Ballesta & García-Meca, 2011; Frank et al., 2020; Jiang, 2008).

The current ratio reflects a company's ability to meet its short-term commitments. Listiawati and Paramita's 2018 study shows that the indicator can influence bond yields. Debt-to-equity ratios, like profitability ratios, primarily ROA, are recognized in the literature for their ability to influence bond prices. These should fluctuate based on the level of profitability achieved. Company size, represented by total assets or revenue volume, is also known to influence risk and, consequently, the cost of debt. Due to their substantial resources, large companies tend to face a lower likelihood of bankruptcy or financial failure compared to smaller firms.

Santosuosso (2014) uses a sample of 3,556 unlisted Italian public companies between 2007 and 2011, belonging to sectors other than the financial sector, and examines the relationship between the cost of debt and the following profitability measures: return on sales, return on investment, return on assets, EBITDA/interest coverage ratio, debt-to-total debt ratio, and debt-to-total assets ratio. The results reveal a negative relationship between the dependent variable and return on investment, return on assets, and EBITDA/interest coverage ratio.

Stanišić et al.'s (2016) explore the drivers of debt costs for firms operating in Serbia. Considering a representative sample of over 90% of the largest firms over the period 2008-2013, the results reveal that the factors influencing debt costs include industry, size, leverage, Euribor rates, interest coverage ratio, equity capital, and ownership structure.

Latif et al.'s study (2019) examines and analyzes the ability of internal firm factors, namely firm size, bond rating, profitability, and leverage, to influence the yield to maturity of corporate bonds. The study involves companies that issued bonds traded on the Indonesian Stock Exchange (IDX) during 2017-2018. The sample includes 104 corporate bonds from 40 companies that constitute the target population. The results show that firm size has a positive effect and profitability a negative effect; rating and leverage had no effect.

Weniasti (2019) analyzes the effect of bond rating, return on asset (ROA), debt-to-equity ratio, and firm size on the yield to maturity of corporate bonds. The sample includes 67 bonds issued by 29 companies from all sectors except banking and finance. The results show that rating and size have a significant negative effect on YTM, while ROA and debt-to-equity ratio had no impact on YTM.

Zulfa and Nahar (2020) examine how various factors – interest rates, bond ratings, company size, exchange rates, coupon rates, maturity, bond liquidity, solvency, and profitability – influence corporate bond returns. The research is based on bond-issuing companies listed on the Indonesian Stock Exchange between 2015 and 2017. The results of the analysis, which involved a sample of 90 bonds issued by 12 companies, reveal that coupon rates and maturity are the determinants with the greatest impact on bond returns. Coupon rates have a positive and statistically significant impact, while maturity showed a negative relationship. The other variables were found to be insignificant: interest rates, bond ratings, company size, exchange rates, bond liquidity, solvency, and profitability have no effect on bond yields. Similar results are highlighted in the work of Hamid (2023).

Fitriadi and Marsoem (2022) investigate the effect of current liquidity ratio, debt-to-equity ratio, return on assets, total assets, and maturity on the yield to maturity of bonds traded on the Indonesian Stock Exchange (IDX) in 2020. The sample includes 302 bonds issued by 69 companies. The results show a significant effect of return on equity, total assets, and maturity on bond returns, while current liquidity ratio and debt-to-equity ratio have no effect.³

Sanjaya and Mary (2023), analyzing bonds listed on the Indonesian Stock Exchange (IDX) for the period 2017-2021, show a significant effect of bond rating and company size on yield to maturity. Maturity, however, has no significant impact.

2.4 Non-Financial Factors Influencing the Cost of Debt

Among the non-financial factors, the analysis of the social performance and the impact of board members' gender on the cost of debt is noteworthy. The study by La Rosa et al. (2018) is among the works investigating corporate social performance and its impact on the cost of debt capital measured with accounting and market-based data. The results, derived for a sample of European non-financial companies listed on the stock exchange from 2005 to 2012, identify a negative relationship between corporate social performance and interest rates and a positive link between social performance and debt rating, recognizing corporate social performance as a factor capable of reducing the cost of debt.

Magnanelli and Izzo (2017) investigate the relationship between corporate social performance and the cost of debt. Using a heterogeneous sample of 332 companies from different countries and sectors, the results show a positive association between social performance and the cost of debt. The study by Aksoy and Yilmaz (2023) tests the effects of gender and board characteristics on the cost of debt. The analysis focuses on 211 non-financial companies listed on the Istanbul Stock Exchange using data from 2016 to 2020. Gender diversity in both top management positions (chairman) and board members translates into a lower cost of debt and a lower perception of default risk among lenders. Other characteristics such as board independence and size do not have significant effects on the cost of debt.

The findings of Tanin et al. (2024), based on a sample of publicly traded US companies from 2007 to 2010, highlight the negative impact of firm size and leverage on the cost of debt. Liquidity has a positive impact when the cost of debt is high.

2.5 Research Question

Based on the analysis of the studies summarized in this section, this paper aims to contribute to the existing literature by answering the following research question:

RQ: What is the relationship between the cost of debt and corporate performance measures for European companies?

The upcoming section outlines the dataset and the econometric framework employed in this research.

3. Method

3.1 Data and Sample

Following the literature, this paper intends to detect the existence of a relationship between the cost of debt and economic and financial variables. The study draws on a sample of companies issuing corporate bonds traded on the Euronext markets. The analysis begins with the mapping of bonds: in 2024, traded bonds are 5,975 with the following distribution across the various markets:

Table 1. Distribution of bonds trades on Euronext markets

Market	N ° of bonds (total)	%	N ° of bonds (corporate)	%
Nordic Alternative Bond Market	1,439	24.08%	299	12.64%
EuroTLX	1,089	18.23%	423	17.89%
MOT	901	15.08%	147	6.22%
Oslo Børs	740	12.38%	396	16.74%
Euronext Paris	706	11.82%	391	16.53%
Euronext Access Milan	349	5.84%	283	11.97%
Euronext Expert Market	236	3.95%	76	3.21%
Euronext Brussels	139	2.33%	62	2.62%
Euronext Access Paris	81	1.36%	78	3.30%
Euronext Amsterdam	81	1.36%	41	1.73%
Euronext Growth Paris	73	1.22%	72	3.04%
Euronext Lisbon	67	1.12%	25	1.06%
Euronext Growth Brussels	53	0.89%	51	2.16%
Euronext Access Lisbon	19	0.32%	19	0.80%
Euronext Paris, Amsterdam	2	0.03%	2	0.08%
Total	5,975	100.00%	2,365	100.00%

Source: Own elaboration.

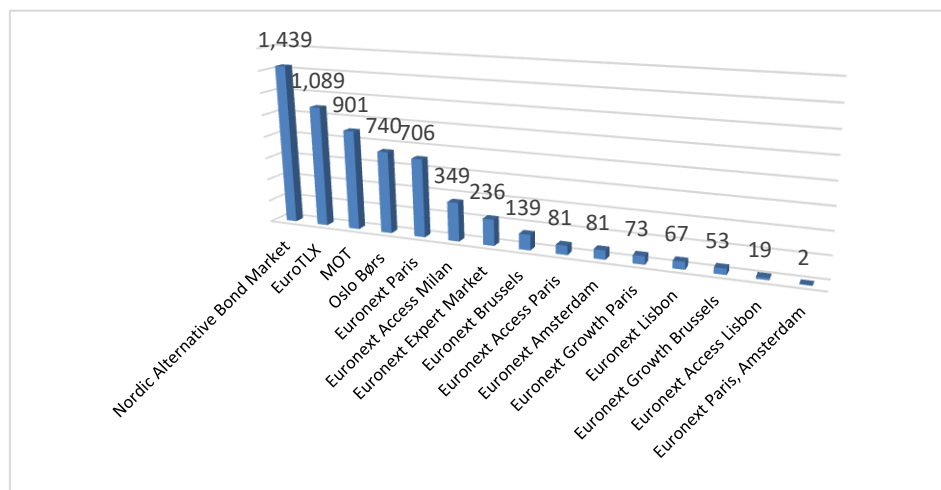


Figure 1. Number of bonds traded on Euronext markets

Source: Own elaboration.

24.08% of the bonds are traded on the Nordic Alternative Bond Market, followed by EuroTLX with 18.23%, MOT with 15.08%, Oslo Børs with 12.38% and Euronext Paris with 11.82%.

Corporate bonds represent 39.58% of total traded bonds. The EuroTLX is the main market where 17.89% of corporate bonds are traded, followed by Oslo Børs (16.74%), Euronext Paris (16.53%), Nordic Alternative Bond Market (12.64%) and Euronext Access Milan (11.97%). Among these, long term bonds (with maturities between 9 and 11 years) were selected, resulting in 101. They are issued by 32 companies. By imposing the availability of data for all variables and for the entire period as a composition criterion, the final sample consists of 25 bond-issuing non financial companies. The companies operate in various sectors as shown in Table 2. This is a varied composition that includes both manufacturing and other sectors such as construction, utilities and trade.

Table 2. Sectors of the sample companies

NACE code	NACE description
7010	Business management
4211	Construction of roads, highways
6311	Data processing, web hosting services
3511	Electricity generation
3522	Gas distribution
1105	Manufacture of beer
2444	Manufacture of copper
2611	Manufacture of electronic components
2910	Manufacture of motor vehicles
1723	Manufacture of office stationery
2932	Manufacture of parts and accessories of motor vehicles
2120	Manufacture of pharmaceutical preparations
2211	Manufacture of tires and rubber hoses
4299	Other construction nec
5829	Other software publishing
6190	Other telecommunications
0610	Petroleum extraction
6831	Real estate activities
4778	Retail sale of other new goods nec
3700	Sewage collection and treatment
4950	Transport via pipelines
4675	Wholesale of chemical products

Source: Own elaboration.

3.2 Variables and Regression Model

The analysis uses multiple linear regression. In general, this method has the following explanation:

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n + \varepsilon_i \quad (1)$$

with Y as the dependent variable, α indicating the intercept, $\beta_1 \dots \beta_n$ the coefficients of the regression line, $x_1 \dots x_n$ the independent variables and ε the random error.

The cost of debt is considered as dependent variable and it is assumed as the yield to maturity on a long-term bond. Yield to maturity represents the expected return for an investor who purchases a bond at its current market value and holds it until the maturity date (Weniasti & Marsoem, 2019). The determination of yield to maturity is based on the assumption that coupon payments are reinvested at the same rate as the bond's current yield, taking into account variables such as the bond's market price, the nominal value to be received at maturity, the coupon rate, and the remaining maturity period (Ulfah et al., 2019). Accounting quantities belonging to the area of liquidity and profitability were used as independent variables, in line with the literature on the subject. The model includes the ratio between net working capital and total assets, ROA, leverage (considered in logarithmic form), interest coverage ratio, current ratio, EBIT variation coefficient and profit variation coefficient. The latter reflects the variability of company results over time. These are identified by the scientific literature as determinants of credit risk and corporate ratings: the measures are classified into specific categories, among which those related to financial data and corporate structure, have always been particularly important. Among the former are ratios derived from financial statements, indicators capable of summarizing some of the unique characteristics of companies and useful for measuring their solvency and the creditworthiness to be assigned (Altman, 1968; Ederington, 1985; Cannata, 2001; Kamstra et al., 2001; Blume et al., 1998; Gray, 2006; Hwang, 2010). Over time, financial ratios have consolidated their importance in defining a company's creditworthiness, so much so that a rating assessment that ignores these factors is often considered incomplete (Matthies, 2013; Ashbaugh-Skaife et al., 2006).

The data refer to the period 2019-2023 and are collected from Orbis Europe. Values greater than the mean ± 3 standard deviations are considered outliers and are winsorized to the 5th and 95th percentiles. Further details on the calculation of the variables are included in Table 3.

Table 3. Variables definitions

	Description	Computation
<i>Dependent variable</i>		
YTM	Yield to maturity	Coupon+((100-price)/time to maturity)/price*100
<i>Independent variables</i>		
NWC/TA	Net Working Capital to Total Assets	Net Working Capital/Total Assets
ROA	Return On Assets	Net Income/Total Assets
Ln REV	Revenue	Log (Operating revenue)
Lev	Leverage	Total debt/Total Liabilities
IC	Interest Coverage ratio	EBIT/Interest Expense
CR	Current Ratio	Current Assets/ Current Liabilities
VC EBIT	EBIT variation coefficient	Standard Deviation of EBIT/ Mean EBIT
VC NI	Net income variation coefficient	Standard Deviation of Net Income/ Mean Net Income

Source: Own elaboration.

The quantitative analysis model represented by multiple linear regression is specified as follows:

$$YTM = \alpha + \beta_1 \left(\frac{NWC}{TA} \right) + \beta_2 ROA + \beta_3 Ln REV + \beta_4 Lev + \beta_5 IC + \beta_6 CR + \beta_7 VC EBIT + \beta_8 VC NI + \varepsilon_i \quad (2)$$

The theoretical framework can then be represented graphically:

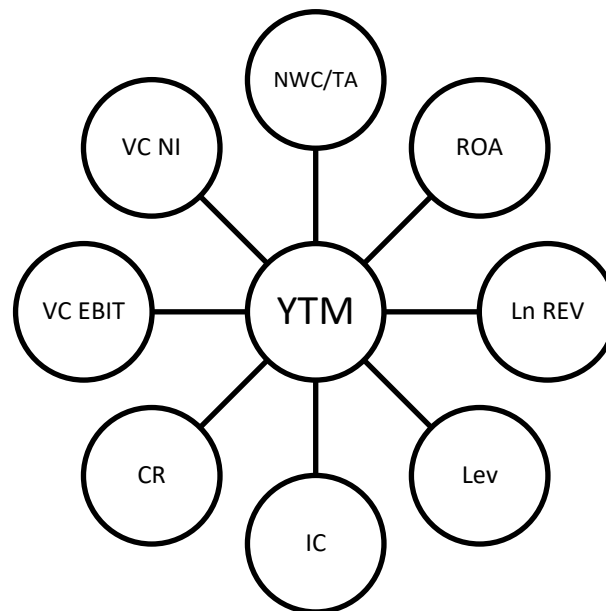


Figure 2. Theoretical framework

Source: Own elaboration.

4. Results and Discussion

4.1 Descriptives Statistics

Table 4 summarizes the descriptive statistics for the variables of the model. For the YTM the average value is 0.032. The net working capital/total assets ratio averages 0.051; this value is consistent with a capital structure geared toward stability and prudent management of short-term sources. The sample companies exhibit an average level of profitability, expressed by ROA, of 0.030. The average leverage is 0.653, and the interest coverage ratio highlights the companies' high ability to sustain financial expenses. A combined reading of these two indicators suggests a solid financial profile: the companies use debt strategically and sustainably, generating returns more than sufficient to cover its cost. The current ratio averages 1.173, demonstrating a good match between short-term investments and sources and a sign of financial stability that allows the company to confidently meet its immediate obligations. The coefficient of variation for EBIT and operating profit averaged 0.622 and 0.782, respectively. These values indicate variability that fluctuates but remains within manageable margins. All variables, except the interest coverage ratio, have a low standard deviation value.

Table 4. Descriptive statistics, variance inflation factor

	Mean	Median	SD	N
YTM	0.032	0.028	0.011	25
NWC/TA	0.051	0.045	0.077	25
ROA	0.030	0.024	0.026	25
Ln REV	15.909	17.029	2.364	25
Lev	0.653	0.673	0.169	25
IC	80.182	5.038	204.236	25
CR	1.173	1.079	0.401	25
VC EBIT	0.622	0.380	0.673	25
VC NI	0.782	0.476	1.943	25

Source: Own elaboration.

4.2 Multicollinearity Check

Before the regression analysis, the data were checked for multicollinearity problems. In line with this objective, correlations were analyzed and Variance Inflation Factor (VIF) values were determined. Numerous studies have indicated that multicollinearity may become problematic when correlation coefficients rise above 0.8 or when VIF values reach levels superior to 10. Table 5 summarizes the results of the correlation analysis. As can be seen,

the correlation values are far from the 0.8 threshold: it reached a maximum value of 0.658 suggesting an acceptable level of independence between the variables.

Table 5. Correlation matrix

	NWC/TA	ROA	Ln REV	Lev	IC	CR	VC EBIT	VC NI
NWC/TA	1							
ROA	0.658***	1						
Ln REV	-0.370	-0.312	1					
Lev	-0.145	-0.576**	0.289	1				
IC	0.316	0.590**	-0.499*	-0.482*	1			
CR	0.514**	0.620***	-0.141	-0.256	0.165	1		
VC EBIT	-0.157	-0.195	0.028	-0.011	0.288	-0.168	1	
VC NI	0.117	0.118	-0.089	-0.077	0.041	-0.048	0.274	1

Source: Own elaboration.

The observed VIF values, remaining below 10, suggest a general absence of strong multicollinearity within the model. At the same time, tolerance values greater than 0.10 indicate the absence of serious multicollinearity (Table 6). Overall, these values indicate that the independent variables are not highly correlated with each other, so the estimated coefficients in the model are stable and reliable.

Table 6. Tolerance and Variance Inflation Factor (VIF)

	Tolerance	VIF
NWC/TA	0.412	2.428
ROA	0.155	6.467
Ln REV	0.584	1.712
Lev	0.521	1.920
IC	0.286	3.502
CR	0.493	2.028
VC EBIT	0.524	1.908
VC NI	0.761	1.314

Source: Own elaboration.

4.3 Results of Regression

The results of the regression analysis are detailed in Table 7. The logarithm of revenues shows a negative regression coefficient of -0.315 with a significance level of 0.010. Since the p-value is less than 0.05, it is possible to conclude that the variable has an effect on the cost of debt. As expected, this is an inverse impact. Ln REV is a proxy of size: the sign of the coefficient suggests that as company size increases, the company is perceived as less risky and therefore has a lower cost of debt. In this case, if revenues increase by 1%, the cost of debt decreases by 0.315%. For ROA, a positive coefficient of 2.930 emerges. For the NWC/TA variable, the results show a positive coefficient with a significance level of 0.570, which, being above the 5% threshold, leads to the conclusion that it is unable to impact YTM.

Continuing with the interpretation of the results, leverage has a positive coefficient of 0.950: the sign is consistent, considering that a greater incidence of debt in the composition of the financial structure makes the company riskier and this consequently produces a higher cost of debt. Interest coverage in the resulting model assumes a negative sign of -0.001: each additional unit of interest coverage translates into a minimal reduction in the cost of debt. In this case too, the consistency of the sign is emphasized, considering that higher values of the ratio are associated with a strong signal of financial solidity. The coefficient of the current ratio is positive and estimated at 0.515. The coefficient of variation of EBIT has a coefficient of 0.002 and the coefficient of variation of profit is 0.076: once again, the coefficients are consistent. If EBIT variability increases by one unit, the cost of debt would increase by only 0.002 percentage points. Similarly, a one-unit increase in profit variability translates into a 0.076 point increase in the cost of debt. The two quantities measure the variability of economic margins: the higher the variability, the more the company is perceived as risky, and this determines a higher cost of debt. For the variables found to be non-significantly associated with the cost of debt in the regression, an analysis was conducted based on specific theoretical frameworks and the operating context of the firms in our sample.

According to Signaling Theory, financial performance measures provide investors with a signal about a firm's financial health and riskiness. Adequate levels of these measures therefore externalize a low-risk signal and lead to a favorable assessment by investors. The implications of Pecking Order Theory and Trade-Off Theory were considered, concluding that the non-significance of a theoretically relevant variable that emerged in the model can be attributed to prevailing internal finance choices or corporate tolerance for debt. As noted by other studies in the literature, the insignificance of leverage can be explained within the context of Agency Theory: the level of leverage does not impact YTM variations. This may be due to the fact that as the portion of debt capital in the financial structure increases, agency costs increase (given the need to satisfy investors' information needs and reduce asymmetries); however, the greater availability of information leads investors to consider bond investments as low-risk and therefore to devalue leverage as a relevant variable.

Table 7. Results of regression

	Unstandardized	Standard Error	Standardized	t	p	
Intercept	6.775	1.980		3.421	0.004	***
NWC/TA	2.283	3.935	0.154	0.580	0.570	
ROA	2.930	18.629	0.068	0.157	0.877	
Ln REV	-0.315	0.107	-0.655	-2.943	0.010	***
Lev	0.950	1.583	0.141	0.600	0.557	
IC	-0.001	0.002	-0.215	-0.674	0.510	
CR	0.515	0.686	0.182	0.750	0.464	
VC EBIT	0.002	0.397	0.001	0.004	0.997	
VC NI	0.076	0.114	0.130	0.669	0.513	

Note. (*), (**), and (***) indicate significance levels of 10%, 5%, and 1%, respectively.

Source: Own elaboration.

I risultati per il coefficiente R^2 sono riportati di seguito:

Table 8. Coefficient of determination R^2

Model	R	R^2	Adjusted R^2	RMSE
M ₁	0.732	0.536	0.305	0.948

Source: Own elaboration.

The analysis revealed an Adjusted R-Square value of 0.305, indicating that approximately 30.5% of the variation in the bond's yield to maturity is explained by the independent variables included in the model, while the remaining 69.5% is attributable to factors not considered in this research.

5. Conclusions and Implications

This paper aimed to identify the relationship between the cost of debt and performance measures for a sample of European companies issuing bonds traded on the Euronext markets. Unlike most existing studies that use the interest rate on outstanding debt or rating as a measure of the cost of debt, this work considers the YTM. The performance measures were selected based on a literature review and are among the common variables considered in assessing credit risk and constructing ratings. In accordance with the literature, they are considered to have an impact on the cost of debt.

The analysis has practical implications for corporate management. It is widely believed that the cost of capital, including its component represented by the cost of debt, impacts the achievement and maintenance of competitive advantage. Companies must act and adopt strategies aimed at containing the cost of debt. Understanding the factors that influence it can help management achieve this goal. This is even more true for highly risky companies: knowing the drivers of debt costs allows for greater awareness, optimizing management by improving the company's image making it more reliable, lowering perceived risk and, consequently, the cost of debt.

6. Limitations and Future Research

This work has some limitations that also provide the basis for further research. These include the small sample size, justified by the analysis process and the imposed criteria, which are appropriately described in the methodology section. In subsequent studies, the sample size can be increased by relaxing sample screening

conditions or expanding data sources. Another limitation is the failure to include among the model's variables explanatory measures of performance other than the economic and financial ones considered here. For example, sustainability performance and innovation which can impact the cost of debt. A further shortcoming is the restricted geographical scope of the study to Europe: it would be interesting to study the relationship by extending the analysis to other contexts characterized by different cultures and characteristics.

References

- Aksoy, M., & Yilmaz, M. K. (2023). Does board diversity affect the cost of debt financing? Empirical evidence from Turkey. *Gender in Management: An International Journal*, 38(4), 504-524. <https://doi.org/10.1108/GM-01-2022-0021>
- Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The Journal of Finance*, 23(4), 589-609. <https://doi.org/10.1111/j.1540-6261.1968.tb00843.x>
- Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2003). Founding family ownership and the agency cost of debt. *Journal of Financial Economics*, 68(2), 263-285. [https://doi.org/10.1016/S0304-405X\(03\)00067-9](https://doi.org/10.1016/S0304-405X(03)00067-9)
- Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2004). Board characteristics, accounting report integrity, and the cost of debt. *Journal of Accounting and Economics*, 37(3), 315-342. <https://doi.org/10.1016/j.jacceco.2004.01.004>
- Arnaboldi, M., Azzone, G., & Giorgino, M. (2014). *Performance measurement and management for engineers*. Academic Press.
- Ashbaugh-Skaife, H., Collins, D. W., & LaFond, R. (2006). The effects of corporate governance on firms' credit ratings. *Journal of Accounting and Economics*, 42(1-2), 203-243. <https://doi.org/10.1016/j.jacceco.2006.02.003>
- Bierman Jr, H., & Hass, J. E. (1975). An analytical model of bond risk differentials. *Journal of Financial and Quantitative Analysis*, 10(5), 757-773. <https://doi.org/10.2307/2330269>
- Black, F., & Scholes, M. (1973). The pricing of options and corporate liabilities. *Journal of Political Economy*, 81(3), 637-654. <https://doi.org/10.1086/260062>
- Blume, M. E., Lim, F., & MacKinlay, A. C. (1998). The declining credit quality of US corporate debt: Myth or reality? *The Journal of Finance*, 53(4), 1389-1413. <https://doi.org/10.1111/0022-1082.00057>
- Boardman, C. M., & McEnally, R. W. (1981). Factors affecting seasoned corporate bond prices. *Journal of Financial and Quantitative Analysis*, 16(2), 207-226. <https://doi.org/10.2307/2330647>
- Briys, E., & De Varenne, F. (1997). Valuing risky fixed rate debt: An extension. *Journal of Financial and Quantitative Analysis*, 32(2), 239-248. <https://doi.org/10.2307/2331175>
- Cannata, F. (2001). Rating esterni e dati di bilancio: Un'analisi statistica. *Studi e Note di Economia*, 3.
- Chen, A. H. (1978). Recent developments in the cost of debt capital. *The Journal of Finance*, 33(3), 863-877. <https://doi.org/10.1111/j.1540-6261.1978.tb02027.x>
- Damodaran, A. (2011). *Damodaran on valuation: Security analysis for investment and corporate finance*. John Wiley & Sons. <https://doi.org/10.1002/9781119201786>
- DePamphilis, D. (2019). *Mergers, acquisitions, and other restructuring activities: An integrated approach to process, tools, cases, and solutions*. Academic Press. <https://doi.org/10.1016/B978-0-12-815075-7.00001-2>
- Derrien, F., Kecskés, A., & Mansi, S. A. (2016). Information asymmetry, the cost of debt, and credit events: Evidence from quasi-random analyst disappearances. *Journal of Corporate Finance*, 39, 295-311. <https://doi.org/10.1016/j.jcorpfin.2016.05.002>
- Ederington, L. H. (1985). Classification models and bond ratings. *Financial Review*, 20(4), 237-262. <https://doi.org/10.1111/j.1540-6288.1985.tb00306.x>
- Fisher, L. (1959). Determinants of risk premiums on corporate bonds. *Journal of Political Economy*, 67(3), 217-237. <https://doi.org/10.1086/258172>
- Fitriadi, S., & Marsoem, B. S. (2022). Analysis of the effect of fundamental and maturity factors on yield to maturity of corporate bonds traded on the Indonesia stock exchange in 2020. *European Journal of Business and Management Research*, 7(5), 39-44. <https://doi.org/10.24018/ejbmr.2022.7.5.1627>
- Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2005). The market pricing of accruals quality. *Journal of*

- Accounting and Economics*, 39(2), 295-327. <https://doi.org/10.1016/j.jacceco.2004.06.003>
- Frank, M. Z., Goyal, V., & Shen, T. (2020). The pecking order theory of capital structure. In *Oxford Research Encyclopedia of Economics and Finance*. <https://doi.org/10.1093/acrefore/9780190625979.013.606>
- Gray, S., Mirkovic, A., & Rangunathan, V. (2006). The determinants of credit ratings: Australian evidence. *Australian Journal of Management*, 31(2), 333-354. <https://doi.org/10.1177/031289620603100208>
- Hamid, A. A., & Razak, A. (2023). Determinants of bond rating and its implications to corporate bond yield. <https://doi.org/10.32479/ije>
- Horrigan, J. O. (1966). The determination of long-term credit standing with financial ratios. *Journal of Accounting Research*, 44-62. <https://doi.org/10.2307/2490168>
- Hwang, R. C., Chung, H., & Chu, C. K. (2010). Predicting issuer credit ratings using a semiparametric method. *Journal of Empirical Finance*, 17(1), 120-137. <https://doi.org/10.1016/j.jempfin.2009.07.007>
- Intrigano, C., Micheli, A. P., & Di Nallo, L. (2016). The cost of debt in unlisted companies. *European Journal of Economics, Finance and Administrative Sciences*, 37(92), 89-95.
- Jiang, J. (2008). Beating earnings benchmarks and the cost of debt. *The Accounting Review*, 83(2), 377-416. <https://doi.org/10.2308/accr.2008.83.2.377>
- Kamstra, M., Kennedy, P., & Suan, T. K. (2001). Combining bond rating forecasts using logit. *Financial Review*, 36(2), 75-96. <https://doi.org/10.1111/j.1540-6288.2001.tb00011.x>
- Kliger, D., & Sarig, O. (2000). The information value of bond ratings. *The Journal of Finance*, 55(6), 2879-2902. <https://doi.org/10.1111/0022-1082.00311>
- Kumar, R. (2015). *Valuation: Theories and concepts*. Academic Press.
- La Rosa, F., Liberatore, G., Mazzi, F., & Terzani, S. (2018). The impact of corporate social performance on the cost of debt and access to debt financing for listed European non-financial firms. *European Management Journal*, 36(4), 519-529. <https://doi.org/10.1002/csr.1379>
- Latif, A., & Marsoem, B. S. (2019). Analysis of company internal factors on yield to maturity of corporate bonds traded on the Indonesia Stock Exchange. *International Journal of Innovative Science and Research Technology*, 4(10), 33-42.
- Listiawati, L. N., & Paramita, V. S. (2018). Pengaruh tingkat suku bunga, inflasi, Debt to equity ratio, dan ukuran perusahaan terhadap yield obligasi pada perusahaan yang terdaftar di bursa efek Indonesia tahun 2010-2016. *Jurnal Manajemen*, 15(1), 33-51. <https://doi.org/10.25170/jm.v15i1.97>
- Magnanelli, B. S., & Izzo, M. F. (2017). Corporate social performance and cost of debt: The relationship. *Social Responsibility Journal*, 13(2), 250-265. <https://doi.org/10.1108/SRJ-06-2016-0103>
- Matthies, A. B. (2013). Empirical research on corporate credit-ratings: A literature review.
- Merton, R. C. (1974). On the pricing of corporate debt: The risk structure of interest rates. *The Journal of Finance*, 29(2), 449-470. <https://doi.org/10.1111/j.1540-6261.1974.tb03058.x>
- Pogue, T. F., & Soldofsky, R. M. (1969). What's in a Bond Rating. *Journal of Financial and Quantitative Analysis*, 4(2), 201-228. <https://doi.org/10.2307/2329840>
- Sánchez-Ballesta, J. P., & García-Meca, E. (2011). Ownership structure and the cost of debt. *European Accounting Review*, 20(2), 389-416. <https://doi.org/10.1080/09638180903487834>
- Sanjaya, S., & Mary, H. (n. d.). Analysis of Bond Rating, Firm Size, Capital Structure and Maturity on Yield to Maturity. *Jurnal Riset Akuntansi dan Keuangan*, 11(1), 1-14. <https://doi.org/10.17509/jrak.v11i1.46846>
- Santosuosso, P. (2014). Cost of debt and corporate profitability. *International Business Research*, 7(2), 13. <https://doi.org/10.5539/ibr.v7n2p13>
- Stanišić, N., Stefanović, N., & Radojević, T. (2016). Determinants of the Cost of Debt in the Republic of Serbia. *TEME: Casopis za Društvene Nauke*, 40(2).
- Tanin, T. I., Sarker, A., Hammoudeh, S., & Batten, J. A. (2024). The determinants of corporate cost of debt during a financial crisis. *The British Accounting Review*, 56(6), 101390. <https://doi.org/10.1016/j.bar.2024.101390>
- Ulfah, H. K., Aprilliani, S., & Adirestuty, F. (2019). Influence of Micro Economic and Macro Economic on Yield to Maturity of Ijarah Sukuk Corporation Year 2014-2017. *KnE Social Sciences*, 126-136.

<https://doi.org/10.18502/kss.v3i13.4200>

Wang, X., Han, L., & Huang, X. (2020). Bank competition, concentration and EU SME cost of debt. *International Review of Financial Analysis*, 71, 101534. <https://doi.org/10.1016/j.irfa.2020.101534>

Weniasti, A., & Marsoem, B. S. (2019). The effect of bonds rating, profitability, leverage, and firm size on yield to maturity corporate bonds. *International Journal of Innovative Science and Research Technology*, 4(8), 286-295.

Zulfa, M., & Nahar, A. (2020). Faktor Determinan Yield Obligasi Perusahaan Korporasi. *KRISNA: Kumpulan Riset Akuntansi*, 11(2), 117-128. <https://doi.org/10.22225/kr.11.2.1418.117-128>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).