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# The influence of cost of debt, cost of equity and weighted average cost of capital on dividend policy decision: evidence from non-financial companies listed on the Frankfurt Stock Exchange

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## Abstract

Non-financial companies listed on the Frankfurt Stock Exchange face considerable difficulties due to expensive funding and the need to make complex decisions about their capital structure. These problems impact their judgments about dividend policy, resulting in ambiguity and possible inefficiency. This study draws on the bird-in-hand theory to investigate the influence of the cost of capital on dividend policy decisions among non-financial firms listed on the Frankfurt Stock Exchange, focusing on 227 companies from 2005 to 2022. The data for this study were sourced from Thomson Reuters Datastream. Employing the common shock autoregressive distributed lag (CS-ARDL) and two-step generalized method of moments (GMM) estimations, findings reveal that the cost of debt consistently negatively impacts dividend payouts and coverage ratios. In contrast, the cost of equity has an insignificant effect. Conversely, the weighted average cost of capital positively influences dividend payouts and coverage ratios but negatively influences dividend yield. All the findings supported the bird-in-hand theory except for the negative impact of WACC on dividend yield. These insights highlight the importance of considering the cost of capital and market share dynamics in dividend policy formulation. Firms should prioritize efficient debt management to sustain dividend distributions, and aligning dividend policies with overall capital structure management is crucial in this regard, providing a sense of reassurance and confidence to the firms and their stakeholders. This study provides valuable guidance for financial decision-makers navigating dividend-related strategies within corporate environments.

**Keywords** Capital, Cost, Dividend, Market share, Non-financial

## Introduction

The notion of cost of capital is fundamental in financial decision-making for organizations, playing a crucial role in strategic planning and resource allocation [35]. The term minimum rate of return is the lowest level of profit that investors anticipate receiving from their investments in a company's projects and initiatives. It measures the costs of acquiring funding for many parts of a company's operations, such as expenditures in new projects, expansion efforts and daily activities [34]. The intricacies of the cost of capital allow companies to assess the viability and

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profitability of prospective investment ventures. Companies can determine the potential value for shareholders by analyzing the expected returns of a project or investment about the cost of capital [138]. The evaluation is essential for making informed decisions on the allocation of capital, as it assists in prioritizing projects with the greatest probability of generating returns that surpass the cost of capital.

Dividend policy is an essential aspect of finance that regulates the allocation of profits to a firm's shareholders [66]. It refers to a company's plan for dispersing profits while considering the need for reinvestment and long-term growth. This policy is essential for balancing the interests of shareholders who want to profit from their investments and the company's goals of keeping earnings for future growth and development projects [70]. Companies employ a dividend policy to balance distributing dividends to shareholders and keeping funds for operational requirements and strategic growth prospects [52].

The relationship between the cost of capital and dividend policy is essential for organizations seeking to optimize their capital structure and enhance shareholder value [43]. The expense of acquiring funds is a vital element in making financial decisions. It is used to assess investment opportunities and determine the most efficient allocation of financial resources within a company [116]. By examining how changes in the cost of capital impact decisions on dividend policy, companies can learn about the complex choices between paying profits to shareholders and holding earnings for reinvestment [133].

When evaluating dividend policy, corporations must balance the desires of shareholders who want immediate profits from their investments with the need to maintain financial flexibility and support future growth plans [37]. The cost of capital is a crucial perspective to assess these trade-offs. When the cost of capital is high, which suggests that investors anticipate a significant return on their investment, companies may retain more revenues to fund internal growth prospects instead of paying out dividends [109]. In contrast, when the cost of capital is low, indicating reduced investor expectations, corporations may be more motivated to allocate earnings to shareholders through dividend payments.

Knowing how the cost of capital affects dividend policy decisions allows companies to make well-informed decisions about their dividend payout ratios [10]. Companies can balance rewarding shareholders with dividends and conserving revenues for future investment by aligning dividend payouts with the cost of capital [100]. Striking a balance between retaining shareholder trust, supporting long-term growth objectives and ensuring financial agility and resilience in the face of market volatility is crucial. The influence of the cost of capital on dividend policy is

complex and emphasizes the significance of strategic financial decision-making for companies. Companies can strategically utilize information from the cost of capital to improve their dividend policy, resulting in increased shareholder value, strengthened investor confidence and sustained long-term growth [136]. Furthermore, by synchronizing dividend payouts with the cost of capital, companies can effectively allocate financial resources and take advantage of strategic growth opportunities, thus maintaining a competitive advantage in dynamic market settings [3].

There is a noticeable gap in the literature regarding empirical studies that delve into the influence of the cost of capital on dividend policy in short and long periods. While numerous studies have explored factors affecting dividend policy, such as tax consideration, cash flow, profitability and earnings stability [13, 57, 131], there is a clear need to broaden our understanding. This necessitates further empirical studies to explore how the cost of capital also affects dividend policy in both short- and long-run periods. Some studies have examined the impact of the cost of debt and the cost of equity on dividend policy decisions, with a focus on dividend payout, neglecting dividend yield and dividend coverage ratio [49, 68, 80, 122, 59]. A dividend payout does not give a complete view of a company's financial stability and longevity. Hence, it should not be relied upon as the sole metric to evaluate dividend policy. Furthermore, the influence of the WACC on dividend policy decisions, particularly concerning dividend payout, cover ratio and dividend yield, remains unexplored.

Furthermore, the overlooked role of market share in influencing the relationship between various costs of capital and their impact on dividend policy decisions presents a unique research opportunity. This gap not only necessitates a direct examination of how market share might moderate this relationship but also holds the potential to provide practical advice for enterprises. The insights gained from these studies could guide organizations in improving their capital structure and increasing the value for their shareholders [139].

Our study is guided by two key research questions: Firstly, we aim to understand how the cost of capital influences dividend policy. Secondly, we explore whether market share can moderate this relationship. By addressing these questions, we aim to provide valuable insights that can inform dividend policy decisions and help practitioners navigate the influence of market dynamics on the cost of capital–dividend policy relationship.

The research adds to the existing body of knowledge in several ways. First, we investigate how the cost of equity affects dividend payout, yield and coverage ratio. Financial analysts can use these findings to predict how

changes in the cost of equity might affect a company's dividend policies. For instance, if a company's cost of equity increases, it may lead to a reduction in dividend payout and yield, which could signal investors to reassess their investment decisions. This adds to the existing body of knowledge by investigating the impact of equity investors' expected returns on company dividend decisions. Companies may reduce dividend payouts and yields if they are compelled to keep more earnings to fund expansion due to a rising cost of equity. On the flip side, shareholders may be able to pay out larger dividends if the cost of equity drops. Understanding this relationship is one way to gain insight into the impact of equity financing costs on dividend initiatives.

Our research contributes to the theoretical understanding of the relationship between the cost of debt and dividend payout, yield and coverage ratio and provides practical implications for financial decisions. Understanding how these factors influence a company's ability to distribute dividends can guide financial analysts in their investment strategies. For instance, a rise in the cost of debt may necessitate a reduction in dividend cash on hand, lower payout ratios and lower dividend yields. These findings offer valuable insights into factors influencing dividend policies about debt servicing priorities, making them directly applicable in real-world financial scenarios.

Thirdly, our research assesses the significant influence of the WACC on dividend payout, dividend yield and dividend coverage ratio. The WACC, as a measure of the total cost of capital, directly impacts dividend policy and other financial strategies. A higher WACC could lead to a lower coverage ratio, lower yields and more conservative dividend policies. This understanding of the effect of WACC on dividends is crucial for a comprehensive evaluation of the influence of total capital costs on dividend decisions and sustainability.

Finally, our research makes a significant contribution to the field of corporate finance by investigating the moderating role of market share on the relationship between cost of capital and dividend policy. This study offers valuable insights into how external market factors shape firms' dividend policy decisions, enriching the existing literature on dividend policy and advancing our understanding of the complex dynamics of corporate finance. The study's findings are not only informative but also have the potential to shape future research and financial strategies.

Understanding the impact of the cost of capital on dividend policy choices is essential for firms, policymakers, managers, investors and stakeholders. This relationship provides valuable information on the financial factors that

influence dividend distribution plans, company decision-making and regulatory frameworks. By providing detailed insights, this research seeks to improve financial transparency, boost the efficiency of capital allocation and promote sustainable business growth. Ultimately, it equips stakeholders with the necessary knowledge to navigate the ever-changing corporate finance landscape efficiently.

## Literature review

### Bird-in-hand theory

The bird-in-hand theory, formulated by Myron Gordon and John Lintner, provides valuable insights into the interplay between the cost of capital and a company's dividend policy decisions [52]. It implies that investors prioritize receiving immediate dividends rather than taking the risk of uncertain future financial gains. The preference for dividends stems from the belief that they provide concrete and immediate profits, whereas capital gains are unpredictable and may not materialize [26]. Companies consider this when making dividend distributions, considering how the cost of capital affects their decisions about dividend policies. The cost of capital signifies the minimum rate of return that investors want to invest in the company's shares, considering the associated risk level. When the cost of capital is elevated, indicating investors need higher returns to compensate for perceived risk, management may implement a more liberal dividend policy [60]. This is because delivering dividends offers investors instant profits and is less risky than potential future capital gains. Issuing dividends allows the company to attract investors and increase its stock price, thereby reducing the cost of capital [135].

Conversely, when the cost of capital is low, indicating that investors are willing to accept reduced profits, management may choose to retain earnings rather than distribute dividends (Smith and Pennathur, [124]). By reinvesting profits into growth opportunities, the company can achieve higher returns, thereby increasing the overall value of the company for its shareholders in the long run (Fajaria and Isnalita, [47]). Under these circumstances, retaining profits may be more beneficial than distributing them as dividends. This strategy can result in higher future profits from capital appreciation and a lower cost of obtaining funds.

The bird-in-the-hand hypothesis suggests that the cost of capital influences dividend policy choices by changing management's assessment of investor preferences for immediate income versus potential future capital gains [83]. Companies may choose to distribute more dividends when the cost of capital is high and retain earnings for reinvestment when the cost is low.

Aside from the bird-in-hand theory, dividend policy studies have also incorporated additional theories, such as the dividend irrelevance theory, the agency theory and the signaling theory. A significant contribution, the Modigliani–Miller dividend irrelevance theory, posits that in a perfect market, a firm's dividend policy has no impact on its value [107]. However, this theory's practical applicability is limited due to its assumptions of the absence of taxes, transaction costs and market inefficiencies, which do not accurately represent real-world circumstances. This stark contrast between theory and reality underscores the need for more comprehensive theories that can better reflect the complexities of the market.

The agency theory emphasizes the conflicts of interest between managers and shareholders. It proposes that increasing dividends can help alleviate these conflicts by decreasing the free cash flow accessible to managers, thereby restricting their capacity to pursue self-interested actions [75]. While this theory is pertinent, it mainly deals with internal governance concerns rather than the external costs of financing, which is the primary concern of this study. On the other hand, the signaling theory suggests that alterations in dividend payments provide investors with valuable insights into a company's prospects [11]. While this theory emphasizes the importance of dividends in providing information, it also underscores the need for a more comprehensive understanding of dividend decisions, particularly the impact of financing costs, for a complete comprehension of the consequences of capital structure.

The bird-in-hand theory, which considers investor preferences for dividends over future capital gains, is particularly advantageous for this study. It sheds light on why non-financial corporations may prioritize dividend payments and provides a deeper understanding of investor behavior and its link to the firm's cost of capital, making it a crucial component of this research.

In order to properly tackle the shortcomings of the bird-in-the-hand hypothesis, the study used several dividend policy variables, including the dividend payout ratio, dividend coverage ratio and dividend yield. These metrics offer tangible, data-driven assessments of a company's dividend policy, unveiling a more detailed comprehension of investor preferences and behaviors. The study revealed that corporations employ various tactics regarding dividend payments and retained earnings, as evidenced by the dividend payout ratio analysis. The variation in payout rules indicates that investor preferences are not uniform, contradicting the assumption of the bird-in-the-hand hypothesis that all investors universally favor high dividends [127].

The dividend coverage ratio overcomes the constraints of the theory by evaluating the long-term viability of

dividend payments. The indicator offers insights into the ability of firms to sustain dividend payments while maintaining financial stability [23]. The statement emphasized that confident investors may favor a well-rounded strategy that guarantees long-term financial stability rather than quick, large returns, thereby questioning the oversimplified perspective of the theory. The analysis of dividend yield enabled the researchers to assess the appeal of dividends to stock prices across different market situations [119]. This statistic indicated that investor preferences may vary depending on stock prices and market dynamics, questioning the notion that all investors have an equal preference for dividends.

### Hypothesis development

#### *The influence of cost of debt on dividend policy decision*

The dividend payout ratio, dividend yield and dividend coverage ratio are essential indicators utilized to assess a company's dividend policy. The cost of capital can impact all of these.

The dividend payout ratio quantifies the proportion of profits allocated to stockholders as dividends. When the cost of capital is high, and investors require greater returns to offset perceived risk, management tends to retain more earnings instead of dispersing them as dividends [60]. Adopting a conservative approach ensures that the company has sufficient funds to support future growth and maintain competitiveness, resulting in a lower dividend payout ratio. Alternatively, when capital expenses are minimal, management may allocate a greater part of profits as dividends, leading to an increased dividend payout ratio [31].

The dividend coverage ratio assesses the company's ability to pay dividends by utilizing its earnings. When the cost of capital is elevated, management prioritizes retaining earnings to maintain financial stability and enhance future growth opportunities [112]. Consequently, funds are scarce for distributing dividends, leading to a decreased dividend coverage ratio. Conversely, when capital is inexpensive, management has more flexibility to distribute dividends, resulting in higher dividend coverage ratios because earnings comfortably cover the payments made to shareholders [79].

The dividend yield is a metric that compares a company's annual dividend income to its stock price. Investors expect higher returns during periods of expensive capital to justify the perceived risk. Management's reluctance to disburse dividends may decrease the dividend yield [95]. Conversely, when capital is inexpensive, it incentivizes management to allocate more dividends to attract income-seeking investors, leading to increased dividend yields.



Jiang and Jiranyakul [68] investigated the correlation between the cost of debt and dividend payout among firms listed on the New York and Shanghai Stock Exchanges. The study gathered panel data from 537 listed companies on the New York Stock Exchange and 378 firms on the Shanghai Stock Exchange from 1992 to 2008. Utilizing both random and fixed effect models, the study aimed to determine the impact of the cost of debt on dividend payouts. Results indicated a positive and significant influence of the cost of debt on dividend payouts among firms listed on the New York Stock Exchange. In contrast, a significant negative influence was observed among firms listed on the Shanghai Stock Exchange.

Farooq and Jabbouri [49] examine the relationship between dividend payout ratios and cost of debt in emerging markets, mainly focusing on the MENA region during the period from 2005 to 2011, finding a significantly negative association between dividend payout ratios and cost of debt, suggesting that high dividend payouts reduce information asymmetries, thereby leading to lower returns demanded by creditors, with a more pronounced effect observed in firms with higher information asymmetries, indicating the greater value relevance of high dividend payout ratios in firms with limited information availability.

Lucky and Akani [81] investigated the impact of the cost of capital on the dividend policy of deposit money banks in Nigeria, utilizing cross-sectional data from 15 banks' financial statements for 2010–2017. They employed retention and dividend payout ratios as proxies for dividend policy, while the cost of short-term borrowings was used as a proxy for the cost of debt. Adopting the fixed effect regression model following Hausman's test, they found a positive relationship between the cost of short-term borrowings and the dividend payout ratio, indicating that an increase in the cost of short-term borrowings positively affects the dividend payout ratio of deposit money banks.

Likitwongkajon and Sangchan [80] investigate the impact of dividends on debt pricing decisions using data from Thai-listed companies from 2000 to 2016. Through panel regression analysis, the study finds no significant association between the cost of debt capital and dividend payouts. This result remains consistent even when alternative dividend measurements are used during periods excluding the global financial crisis. The study contributes to understanding dividend payout consequences by highlighting that dividend may not offer additional insight when there are minimal agency conflicts of interest, particularly in a dominant family-run business environment.

A study by [6] found that higher levels of debt are associated with lower dividend payouts, suggesting that

firms with higher debt levels face greater financial constraints and prioritize debt repayments over dividend distributions.

Yusof and Ismail [135] conducted a study that found that companies with higher debt levels are more likely to pay lower dividends. This suggests that these companies prioritize using their funds for debt repayment rather than distributing dividends to shareholders. Jiang and Jiranyakul [68] found that the expense of borrowing money has an adverse impact on the distribution of profits to shareholders. Companies with higher costs associated with their debt are less inclined to disburse their earnings as dividends, indicating that their debt obligations constrain their ability to pay dividends. Kathuo et al. [72] discovered a noteworthy inverse correlation between financial leverage and dividend payout ratio. Elevated levels of debt result in diminished dividend disbursements due to the augmented financial obligation of servicing the loan.

A study by Nguyen Trong and Nguyen [97] found that companies with elevated debt levels tend to decrease their dividend disbursements. This evidence supports the assertion that companies with substantial debt prioritize meeting their obligations rather than delivering dividends to reduce financial risk. A study by Ahmed et al. [4] revealed that companies with greater debt tend to adopt more cautious approaches regarding their dividend policy. Firms hold earnings to maintain adequate liquidity for debt repayments due to the elevated cost of debt. A study by Malik et al. [84] discovered a negative correlation between the degree of debt in companies and their dividend distributions. In other words, organizations with higher debt levels are more likely to have lower dividend payouts. Firms are compelled to keep earnings for debt payments due to the higher cost of debt, which reduces the funds available for dividends. Based on these discussions, we hypothesized that:

*H1* The cost of debt statistically and significantly influences dividend policy decisions.

#### **The influence of cost of equity on dividend policy decision**

The cost of equity substantially impacts decisions related to dividend policy, affecting the dividend payout ratio, dividend yield and dividend coverage ratio. These measures are crucial for investors when evaluating a company's financial well-being and appeal.

The dividend payout ratio reflects the portion of earnings distributed to shareholders as dividends, reflecting management's strategy for profit allocation. When the cost of equity is elevated, which signifies that investors require greater returns to offset perceived risk,

management frequently maintains a reduced dividend payout ratio [15]. This cautious approach helps safeguard profits for future investments, promoting financial stability and investor confidence. Conversely, management may opt to increase the dividend payout ratio during low equity costs to attract income-seeking investors, potentially enhancing shareholder value [99].

The dividend coverage ratio evaluates a company's capacity to fulfill dividend commitments by utilizing earnings. In response to higher equity costs, management may prioritize retaining earnings to fund growth initiatives and mitigate future uncertainties, potentially resulting in a lower dividend coverage ratio [21]. Conversely, a decrease in the cost of equity could lead to an improved dividend coverage ratio, indicating sufficient earnings to support dividend payments and reflecting a strong financial position [128].

Equity expenses also influence the dividend yield, a metric that quantifies the annual dividend income of the stock price. A higher cost of equity often corresponds with a lower dividend yield, as investors demand higher returns to offset investment risks [38]. In response, management may reduce the dividend payout ratio to allocate more funds for reinvestment, lowering the dividend yield. Conversely, a decrease in the cost of equity could result in an increased dividend yield, appealing to investors seeking consistent income [67, 101].

The cost of equity is crucial in determining dividend policy decisions and shaping investors' perception of a company's financial success and appeal. Shchurina and Mustafina [122] studied dividend strategies in rapidly growing information technology firms, analyzing the impact of cash dividends and stock buybacks on optimizing the cost of capital and enhancing overall company value. Their research in the technology sectors of the USA and Russia highlighted differences in dividend policies, focusing on share repurchases demonstrating positive effects on company value and financial stability, potentially reducing the cost of capital.

A study by Gugler [55] revealed a negative correlation between increased equity costs and reduced dividend payouts. Companies that experience increased equity costs often choose to implement more cautious dividend strategies to handle investor expectations and maximize capital allocation effectively. A study by Esqueda and O'Connor [46] emphasizes the important impact of equity costs on dividend policy decisions. Companies with higher shareholder-required rates of return tend to retain earnings instead of distributing them as dividends to promote future growth and preserve financial flexibility.

A study by Goergen et al. [54] found that companies make modest adjustments to their dividend payments in response to changes in predicted earnings, which are influenced by the cost of equity. Firms emphasize keeping earnings for investment possibilities and reducing the dividend payout ratio in response to higher costs of equity. A study by Dempsey and Sheng [41] highlighted that companies modify their dividend policies in response to changes in stock costs. Increased stock costs require meticulous resource allocation, typically leading to reduced dividend disbursements, to secure long-term expansion and uphold financial stability. Based on these discussions, we assumed that:

*H2* The cost of equity statistically and significantly influences dividend policy decisions.

#### **The influence of weighted average cost of capital (WACC) on dividend policy decision**

The weighted average cost of capital (WACC) significantly impacts company dividend policy decisions. It reflects a company's overall financing cost and influences investor expectations regarding dividend distributions. A higher WACC, indicating increased financing costs, often results in a decreased dividend payout ratio. This implies that management can keep a larger portion of the profits and allocate them toward projects that provide greater returns than the WACC, increasing the company's value for its shareholders. In contrast, reducing the WACC decreases the financing expenses, enabling management to allocate a greater proportion of profits as dividends and thereby raising the dividend payout ratio.

Furthermore, an increase in WACC tends to reduce the dividend coverage ratio. Increased financing expenses may restrict the company's capacity to use its earnings to make dividend payments. Conversely, a decrease in WACC improves the dividend coverage ratio because lower financing costs provide greater flexibility in using earnings to meet dividend commitments.

Lastly, a higher WACC is typically associated with a lower dividend yield. Investors demand higher returns to compensate for increased capital costs, leading to lower stock prices relative to dividends. Conversely, a decrease in WACC can result in an increased dividend yield, as lower expected profits may lead to higher stock prices relative to dividends.

A study by [59] on the firms in the consumer goods and agricultural sectors listed on the Indonesia Stock Exchange found that investment and funding decisions did not substantially impact firm value. However, dividend policy had a notable adverse effect, while the cost

of capital significantly benefited firm value. These findings highlight the importance of considering WACC in dividend policy decisions. Companies can optimize dividend distributions by effectively managing WACC while enhancing shareholder value and financial stability. Based on the information presented, we hypothesized that:

*H3* WACC statistically and significantly influences dividend policy decisions.

**Methodology**

**Sample and data**

Germany was selected as the study’s focal point due to its robust economy, well-established financial market and substantial non-financial companies listed on the Frankfurt Stock Exchange [121, 129]. Its diverse industrial sectors and varied corporate governance practices make Germany an ideal setting to explore the impact of the cost of capital on dividend policy decisions.

The research utilized data from 227 non-financial companies listed on the Frankfurt Stock Exchange, covering an extensive 18-year period from 2005 to 2022. Employing a purposive sampling technique ensured the selection of companies with complete financial data during this time frame, enhancing the study’s representativeness and mitigating biases related to missing data.

Thomson Reuters Eikon Datastream was the primary data source, providing reliable and comprehensive financial information widely trusted by researchers

and practitioners [12, 19]. Leveraging this data source ensured consistency and standardization across the selected time frame, facilitating robust analysis and interpretation of the findings.

Non-financial companies were specifically targeted for analysis to focus on firms operating in various industries. Financial institutions with potentially divergent dividend policies and cost of capital dynamics due to regulatory constraints and distinct business models were excluded [87]. This approach aimed to yield insights applicable to a broader spectrum of industries and effectively capture the relationship between the cost of capital and dividend policy decisions.

**Dependent and independent variables**

The study utilized three dependent variables and four independent variables, as given in Table 1

**Dependent variables**

**Dividend payout ratio**

The dividend payout ratio is a significant indicator that quantifies the percentage of a company’s profits that it distributes to its shareholders in the form of dividends. Evaluating a firm’s actions regarding its dividend policy is of utmost importance [126]. Gaining insight into the variables that influence this proportion is crucial for investors and policymakers to evaluate a company’s financial health and the efficacy of its capital allocation strategies.

**Table 1** Summary of variable

Index	Variable	Symbol	Formulae
Dependent variables:			
1	Dividend yield	DVY	$\frac{\text{Dividend per Share}}{\text{Price per Share}}$
2	Dividend payout ratio	DYO	$\frac{\text{Dividends per Share}}{\text{Earnings per Share}}$
3	Dividend coverage ratio	DCR	$\frac{\text{Earnings per Share}}{\text{Dividend per Share}}$
Independent variable:			
1	Cost of debt	CDT	$\frac{\text{Annual Interest Expense}}{\text{Total Debt}} * (1 - \text{tax rate})$
2	Cost of equity	CET	$\frac{\text{Dividend per share}}{\text{stock price}} + \text{Growth Rate of Dividends}$
3	WACC	WACC	$\left( \frac{E}{V} \times \text{Cost of Equity} \right) + \left( \frac{D}{V} \times \text{Cost of Debt} \times (-\text{Tax Rate}) \right)$ <p>“E” represents the market value of the company’s equity                      “D” represents the market value of the company’s debt                      “V” represents the total market value of the company (sum of equity and debt)                      Cost of Equity is the required rate of return on equity                      Cost of Debt is the interest rate on debt                      Tax Rate is the corporate tax rate</p>
4	Market share	MKS	$\left( \frac{\text{Company's Sales}}{\text{Total market sales}} \right) \times 100\%$

This study aims to examine the dividend payout ratio and understand how different factors influence management's choices regarding dividend distributions. This analysis provides valuable insights into capital allocation methods and the generation of shareholder value [22].

#### **Dividend coverage ratio**

The dividend coverage ratio assesses a company's capacity to distribute dividends by utilizing its earnings, offering insights into the sustainability of dividend payments and the financial robustness of the organization [118]. The factors influencing this ratio assist stakeholders in assessing the company's capacity to sustain consistent dividend payments, enabling well-informed investment choices. It is crucial for assessing a firm's financial health and stability, namely its capacity to maintain dividend payments in light of economic fluctuations or financial uncertainties [103].

#### **Dividend yield**

The dividend yield is a crucial indicator for investors seeking income from their investments. It indicates the yearly dividend earnings in relation to the company's stock price [126]. This metric is designed to evaluate the appeal of a company's dividend payments and aid investors in calculating the prospective returns from equities that offer dividends, consequently impacting their investing strategy. This metric is crucial for investors who emphasize generating income, as it offers essential insights into the appeal of a company's dividend payments to its stock price [32].

#### **Independent variables**

##### **Cost of debt**

The cost of debt pertains to the interest rate a corporation incurs on its loan obligations. A firm's borrowing expenses are reflected in its financial statements and impact its decisions about its capital structure [93]. Examining the impact of debt costs on decisions about dividend policies provides a valuable understanding of the relationship between financing choices and dividend payments, thereby influencing shareholder value [53]. This statistic is fundamental in evaluating a company's decisions about its capital structure and financing methods. This study investigates the relationship between borrowing expenses, dividend policy decisions and their impact on shareholder value and financial strength by analyzing this variable.

##### **Cost of equity**

The cost of equity is the return rate that investors demand to invest in a company's equity shares. It considers their expected returns and their assessment of the risk

associated with the stock investment [61]. Examining the influence of the cost of equity on dividend policy choices offers valuable information on the company's attractiveness to equity investors and its ability to maintain dividend payments [98]. This indicator reflects the rate of return that investors expect and their assessments of the company's risk and potential for growth. The study aims to analyze this variable to understand the relationship between investor expectations, decisions regarding dividend policy and their impact on shareholder value and competitive position in the market.

##### **Weighted average cost of capital (WACC)**

WACC, calculated by combining the costs of debt and equity, measures a company's total cost of financing and is an important factor in capital planning [134]. The study intends to reveal the influence of a company's overall cost of capital on its dividend distribution methods by examining the relationship between WACC and dividend policy choices [14]. Gaining a comprehension of these dynamics provides valuable insights into the impact on shareholder value and the firm's financial performance.

##### **Market share**

Market share is a measure of the proportion of total sales that a company has within its industry. This metric underscores the relationship between a company's competitive standing, market control and ability to generate profits and pay dividends [69]. Studying the correlation between market share and dividend policy decisions provides insights into how market competitiveness influences dividend payments and shareholder value. Market share is crucial in determining a company's competitive position and profitability [24, 102]. The study analyzes the impact of market dynamics on dividend policy decisions and their consequences for shareholder value and market positioning by analyzing this variable.

##### **Model specification**

Our study employed four models to examine the impact of the cost of capital on dividend policy decisions. In Model 1, denoted as Models A, B and C, we investigated the direct influence of the cost of capital on dividend policy decisions. Models 2, 3 and 4 delved into the interaction effect between the cost of capital components (precisely, the cost of debt, the cost of equity and the weighted average cost of capital) and market share.

##### **Model 1**

$$DPC(A, B, C) = \beta_0_{nft} + \beta_1CDT_{nft} + \beta_2CET_{nft} + \beta_3WACC_{nft} + \beta_4MKS_{nft} + \varepsilon$$



**Model 2**

$$DPC(A, B, C) = \beta_0_{nft} + \beta_1CDT_{nft} + \beta_2CET_{nft} + \beta_3WACC_{nft} + \beta_4MKS_{nft} + \beta_5CDT * MKS_{nft} + \varepsilon$$

**Model 3**

$$DPC(A, B, C) = \beta_0_{nft} + \beta_1CDT_{nft} + \beta_2CET_{nft} + \beta_3WACC_{nft} + \beta_4MKS_{nft} + \beta_5CET * MKS_{nft} + \varepsilon$$

**Model 4**

$$DPC(A, B, C) = \beta_0_{nft} + \beta_1CDT_{nft} + \beta_2CET_{nft} + \beta_3WACC_{nft} + \beta_4MKS_{nft} + \beta_5WACC * MKS_{nft} + \varepsilon$$

where DPC is the dividend policy decision, “DVY” denotes the dividend payout ratio (A), “DYO” denotes dividend coverage ratio (B) and “DCR” denotes dividend yield (C), “CDT” denotes cost of debt, CET denotes cost of equity, WACC denotes “WACC,” “nf” denotes non-financial companies and “t” denotes years.

**Estimation methods**

The study utilized two estimation methods: common shock autoregressive distributed lag (CS-ARDL) and two-step generalized method of moments (GMM), comparing them to the a vector autoregression (VAR) model, the fixed effect and the random effect model. The results in Table 2 indicate the presence of cross-sectional dependence, a crucial factor in the selection of estimation methods. It has been outlined that the VAR, fixed

and random effect models could not address the endogeneity issues and cross-sectional dependence associated with panel data, leading to the selection of CS-ARDL and GMM [115].

The CS-ARDL approach accounts for cross-sectional dependence, a common issue in panel data analysis [115]. This method allows for modeling both short-term and long-term dynamics while accommodating cross-sectional dependence among observations. Given that our dataset exhibited cross-sectional dependence in the cross-sectional tests, the CS-ARDL approach was chosen to address this issue effectively.

CS-ARDL requires variables to have a first-order integration (I (1)) or be cointegrated. This allows for considering common shocks and analyzing long-term associations while accounting for short-term dynamics [117]. This guarantees that the observed connections are not false or misleading because of non-stationarity. It is presented as:

$$y_{it} = \alpha_i + \beta_1 y_{i,t-1} + \gamma_1 x_{it} + \delta_1 z_t + \sum_{l=1}^{p-1} \phi_{ij} (y_{i,t-j} - \alpha_i) + \epsilon_{it}$$

where

- $y_{it}$  is the dependent variable for unit  $i$  at time  $t$ .
- $\alpha_i$  is the individual-specific intercept.
- $\beta_1$  is the coefficient of the lagged dependent variable  $y_{i,t-1}$
- $\gamma_1$  is the coefficient of the contemporaneous explanatory variable  $x_{it}$ .
- $\delta_1$  is the coefficient of the common shock  $z_t$ .
- $\Phi_{ij}$  are coefficients capturing the lagged effects of  $y_{it}$
- $\epsilon_{it}$  is the error term.

**Table 2** Cross-sectional independence tests and heterogeneity test

	Model 1: Dividend payout ratio (A)	Model 1: Dividend coverage ratio (B)	Model 1: Dividend yield (C)
<i>Types of tests</i>			
Pesaran’s test	92.956 (0.000)***	63.381(0.000)***	70.612 (0.000)***
Friedman’s test	2148.227(0.000)***	1589.212 (0.000)***	2012.629 (0.000)***
Frees’ test	4.703 (0.000)***	2.545(0.000)***	4.255 (0.000)***
<i>Heterogeneity test (Peseran–Yamagata test)</i>			
Δ-tilde stat	8.496 (0.000)***	21.738 (0.000)***	6.983 (0.000)***
Δadj-tilde stat	10.346 (0.000)***	27.472 (0.000)***	13.972 (0.000)***

\*\*\* $p < .01$ , \*\* $p < .05$

On the other hand, the two-step GMM technique was employed to tackle endogeneity problems that may arise in panel data analysis [16, 17]. This method uses instrumental variables to help control for potential biases caused by endogeneity and simultaneously provides robustness checks for our findings. By employing the GMM approach, we aimed to ensure the reliability and validity of our results in the presence of potential endogeneity concerns [18].

The effectiveness of two-step GMM depends on the soundness of the instruments employed during the estimate procedure. To ensure that these instruments successfully capture the fluctuation in the explanatory variables that are independent of the error structure, they must be correlated with the endogenous variables of interest while remaining uncorrelated with the error terms [88]. The model assumes overidentification, which occurs when the number of instruments exceeds the number of endogenous variables. This leads to improved efficiency and consistency in estimating the parameters. It is presented as:

$$\theta^{GMM} = \underset{\theta}{\operatorname{argmin}} \left\{ \left( \frac{1}{N} \sum_{i=1}^N g(y_i, x_i, Z_i) \right) W \left( \frac{1}{N} \sum_{i=1}^N g(y_i, x_i, Z_i) \right) \right\}$$

where

- $\hat{\theta}$  GMM is the two-step GMM estimator of the parameter vector  $\theta$ .
- $W$  is a weighting matrix that optimizes the efficiency of the estimator.

Table 2 provides the results of cross-sectional dependence tests and heterogeneity tests conducted to assess the interdependence among cross-sectional units and the homogeneity of coefficients across these units, respectively. These tests aim to uphold the regression model's validity and ensure the estimated coefficients' reliability. Cross-sectional dependence tests, including Pesaran's, Friedman's and Frees', were employed to evaluate

interdependence among cross-sectional units. Additionally, the Peseran–Yamagata test was utilized to assess coefficient homogeneity.

The null hypothesis for both sets of tests posits the absence of cross-sectional dependence or heterogeneity, while the alternative hypothesis suggests their presence. Across all models (A, B and C), the  $p$ -values associated with the tests are extremely low (0.000), indicating statistical significance at the 1% level. Consequently, the null hypothesis is rejected in favor of the alternative hypothesis, indicating the presence of cross-sectional dependence and coefficient heterogeneity across the panel data.

The presence of cross-sectional dependence suggests that observations within the panel may not be independent, potentially resulting in biased coefficient estimates. This phenomenon indicates that activities within one company may affect others, complicating traditional regression analyses. Consequently, addressing this issue requires the adoption of more sophisticated methodologies to ensure the validity of regression results. We employed the CS-ADRL and GMM techniques to tackle

this challenge. These methodologies are designed to account for the interdependence among observations within panel datasets, allowing for more accurate estimation of regression coefficients.

### Results and discussions

Table 3 presents the descriptive statistics of all the variables utilized in this study. A dividend payout ratio of 44.142% indicates that, on average, companies allocate a significant portion of their earnings as dividends to shareholders. This suggests a commitment to distributing profits to investors, potentially enhancing investor confidence and attracting dividend-seeking investors [110]. With a mean dividend coverage ratio of 2.695, companies, on average, have earnings 2.695 times higher than

**Table 3** Descriptive statistics

Variables	Obs	Mean	Std. Dev	Min	Max	Skew	Kurt	VIF	1/VIF
Dividend payout ratio	4086	44.142	22.07	23	100	.445	2.693	–	–
Dividend coverage ratio	4086	2.695	1.728	.672	6.248	.803	2.58	–	–
Dividend yield	4086	3.142	3.603	1.241	90.91	1.254	1.132	–	–
Cost of debt	4086	4.127	2.948	1.016	10.751	1.125	3.227	4.286	.233
Cost of equity	4086	30.503	26.764	1.23	88.613	.926	2.767	1.065	.939
WACC	4086	4.097	3.05	.803	10.888	1.099	3.18	4.886	.205
Market share	4086	0.001	.001	0.0001	.010	1.586	3.403	1.021	.98

the amount required to cover dividend payments. This signifies a healthy financial position, indicating that companies possess adequate earnings to sustain dividend payouts over time, which could foster investor trust and support long-term shareholder value [138].

The mean dividend yield of 3.142% reflects the average return on investment from dividends, indicating the income generated from their investments in dividend-paying stocks. The mean cost of debt of 4.127% denotes the average interest rate companies pay on their debt obligations. A higher mean cost of debt may imply higher borrowing costs for companies, potentially impacting profitability and financial flexibility [130].

Similarly, the average return investors want for holding ownership in the company is represented by the mean cost of equity, which is 30.503%. A higher average cost of equity indicates that investors want greater returns to offset the perceived risk associated with investing in the company's equity. The WACC, calculated as 4.097%, represents the company's average cost of financing, considering both debt and equity. A lower WACC indicates lower financing costs, which could enhance profitability and investment attractiveness.

Finally, the mean market share, albeit small at 0.001, provides insight into the average proportion of the market captured by the company. Although they may appear unimportant, fluctuations in market share over time can affect the company's competitive standing and long-term growth prospects [96].

Variables with kurtosis values less than 3, such as dividend payout ratio, cost of equity, dividend yield and dividend coverage ratio, exhibit platykurtic distributions [120]. This indicates that their tails are lighter than those of a normal distribution. On the other hand, variables with kurtosis values greater than 3, including the cost of debt, WACC and market share, demonstrate leptokurtic distributions [85]. This suggests that their tails are heavier than those of a normal distribution.

The variance inflation factor (VIF) measures multicollinearity among independent variables in regression. VIF values below 5 indicate acceptable levels of

multicollinearity. All variables have VIF values below 5 [12], suggesting no significant multicollinearity. For instance, dividend yield and market share have VIFs of 1, indicating a low correlation with other variables. Cost of debt and WACC have VIFs around 4.286 and 4.886, respectively, indicating low multicollinearity. Overall, the absence of significant multicollinearity suggests reliable regression coefficient estimates.

Table 4 presents the correlation matrix results, complementing the variance inflation factor (VIF) analysis and confirming the absence of multicollinearity among the independent variables. The correlation coefficients between the independent variables (columns 4 to 7 and rows 4 to 7) are below the widely accepted threshold of 0.70 [16, 17]. This finding further strengthens the conclusion that multicollinearity is not a significant concern in the regression model. The correlation matrix underscores that the independent variables are not highly correlated with each other, as evidenced by the correlation coefficients below the threshold value. This outcome bolsters the reliability of the regression results and instills greater confidence in the validity of the derived findings.

Table 5 presents the results of panel unit root tests conducted to assess the variables' stationarity. These tests determine whether the variables exhibit unit root behavior, indicating non-stationarity, or are stationary over time. Two methods, Levin, Lin and Chu, and cross-sectional augmented IPS (CIPS), were utilized to evaluate the variables' stationarity. The null hypothesis for both tests is that the variables contain unit roots, suggesting non-stationarity. Conversely, the alternative hypothesis is that the variables are stationary.

The tests were conducted at both the variables' levels and first differences. Results indicate that the null hypothesis of unit roots is rejected at the 1% significance level for all variables, as indicated by the extremely low *p*-values (0.000). These findings suggest that all variables are stationary in their levels or first differences. The results of the panel unit root tests affirm the data's suitability for further analysis and modeling.

**Table 4** Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Dividend payout ratio	1.000						
(2) Dividend coverage ratio	-0.416	1.000					
(3) Dividend yield	0.191	-0.289	1.000				
(4) Cost of debt	-0.030	-0.005	0.069	1.000			
(5) Cost of equity	0.042	-0.009	0.096	0.049	1.000		
(6) WACC	0.001	-0.016	0.058	0.507	-0.048	1.000	
(7) Market share	-0.004	-0.048	0.019	-0.131	-0.042	-0.128	1.000

**Table 5** Panel unit root tests

Variable	Levin, Lin and Chu		Cross-sectional augmented IPS (CIPS)	
	Levels	1st difference	Levels	1st difference
Dividend payout ratio	-16.621 (0.000)***	-16.621 (0.000)***	-26.190 (0.000)***	-26.190 (0.000)***
Dividend coverage ratio	-11.126 (0.000)***	-47.067 (0.000)***	-26.050 (0.000)***	-49.122 (0.000)***
Dividend yield	-17.730 (0.000)***	-2.497 (0.000)***	-24.577 (0.000)***	-47.826 (0.000)***
Cost of debt	-12.336 (0.000)***	-17.562 (0.000)***	-22.273 (0.000)***	-46.261 (0.000)***
Cost of equity	-17.318 (0.000)***	-4.343 (0.000)***	-26.630 (0.000)***	-49.922 (0.000)***
WACC	-9.967 (0.000)***	-12.596 (0.000)***	-21.894 (0.000)***	-45.662 (0.000)***
Market share	-26.795 (0.000)***	-21.859 (0.000)***	-26.347 (0.000)***	-45.767 (0.000)***

\*\*\* $p < .01$ , \*\* $p < .05$

Table 6 presents the outcomes derived from the CS-ARDL models, applied to analyze the relationships among the variable’s dividend payouts ratio, dividend coverage ratio and dividend yield. These models offer valuable insights into both short-run and long-run dynamics among the variables, facilitating a comprehensive understanding of their interplay and potential influences on the dependent variable.

**The effect of cost of capital on dividend payout ratio**

First and foremost, the analysis of the dynamic panel variable, represented by the lag of dividend payout included in the regression model as an independent variable, yielded a positive but insignificant impact on the dividend payout ratio. Malik et al. [84] suggests that while historical dividend trends play a role in decision-making, factors such as current financial performance, investment opportunities and management strategy have a more significant impact on determining current dividend policy.

Secondly, the study revealed that the cost of debt exerts a negative and statistically significant influence on the dividend payout ratio in the short and long run. This is consistent with the findings by Farooq and Jabbouri [49] and supports the study’s hypothesis. This observation, contrasting with the results of Jiang and Jiranyakul [68] and Lucky and Akani [81], has significant implications for corporate financial decision-making. It suggests that companies may prioritize paying down their debts rather than providing dividends when faced with high borrowing costs, a strategic preference that may be based on the need to maintain creditworthiness and financial stability, especially during times of economic uncertainty [33].

Based on the bird-in-hand theory, companies prioritize providing consistent dividend payments to meet the expectations of investors who desire immediate income [73]. Increased debt expenses decrease the

amount of money that can be used for dividend payments, which may cause companies to lower dividend payouts to manage their financial obligations successfully. The findings strongly support the bird-in-hand argument, suggesting that a rise in the cost of borrowing is associated with reduced dividend distributions [8]. The congruence observed indicates that companies prioritize financial stability and sustain continuous dividend payments, even in the face of increased debt costs, to meet investor preferences [74]. The findings emphasize the importance of companies being responsive to investor demands for consistent income streams, reinforcing the need to manage dividend policies carefully.

Thirdly, the study also revealed that the cost of equity had a negative but insignificant effect on the dividend payout ratio in both the short and long run. The findings do not support the study’s hypothesis. Kania [71] emphasizes that while shareholders’ desired returns influence dividend choices, factors such as investment prospects and financial constraints may exert a stronger influence than the cost of equity. Companies might opt to retain earnings instead of distributing dividends to finance promising projects, especially when the cost of equity is high relative to potential returns on investment [36].

As per the bird-in-hand theory, investors prefer receiving present dividends rather than relying on uncertain future capital gains [91]. Consequently, companies often distribute dividends according to their capacity to produce consistent profits and uphold investor trust. This empirical observation suggests that companies tend to distribute smaller dividends when the cost of equity increases. This significant financial decision carries weight and supports the bird-in-hand argument [91]. This is because increased equity costs might decrease the amount of assets available for dividends, forcing companies to prioritize stockholders’ returns over dividend distributions.





**Table 6** (continued)

Variables	Dividend payout ratio				Dividend coverage ratio				Dividend yield			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
	Short-run est				Short-run est				Short-run est			
R-squared	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
R-squared (MG)	0.56	0.56	0.56	0.56	0.42	0.42	0.42	0.42	0.46	0.46	0.46	0.46
Root MSE	14.54	14.55	14.54	14.54	1.31	1.32	1.31	1.31	2.63	2.63	2.63	2.63
ECT	-0.996*** (0.012)	-0.997*** (0.012)	-0.997 (0.012)	-0.997*** (0.012)	-1.014*** (0.012)	-1.014*** (0.012)	-1.015*** (0.012)	-1.014 (0.012)	-1.017*** (0.012)	-1.017*** (0.012)	-1.017 (0.012)	-1.017*** (0.012)

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Conversely, the analysis uncovered that the WACC has a positive and significant influence on the dividend payout ratio in both the short and long run, supporting the study's hypothesis. Companies may modify their dividend policies in reaction to fluctuations in the WACC to indicate their financial well-being and uphold investor trust. Nevertheless, an overreliance on distributing dividends to control the WACC could restrict the allocation of funds toward growth prospects, which could impact the company's long-term profitability [76]. Companies may strategically manage dividend distributions with reinvestment efforts to maximize shareholder value while assuring long-term growth.

The bird-in-hand theory suggests that companies tend to prioritize the payment of stable dividends in order to fulfill investor expectations for a reliable source of income [132]. The results indicate that a rise in WACC is linked to greater dividend distributions. This might be understood as companies continuing or raising their dividend payments despite facing higher financing expenses. These findings support the bird-in-hand theory, which suggests that companies prioritize providing current revenue to shareholders, even if it means incurring higher capital expenses [114].

Moreover, the results indicated that market share has a positive and significant impact on the dividend payout ratio in both the short and long run, supporting the study's hypothesis. This finding, while highlighting the potential for companies with a greater portion of the market to reward shareholders and indicate their dominance, also raises a cautionary note. Excessive dividend payments might hinder innovation and investing in market expansion, which can have a negative impact on future growth prospects [92, 94]. It is crucial for companies to strike a balance between rewarding shareholders and investing in future growth.

Furthermore, the interaction between the cost of debt and market share was found to have a negative and insignificant impact on the dividend payout ratio in both the short and long run. Similarly, the interaction between the cost of equity and market share had a positive but insignificant effect on the dividend payout ratio in both time horizons. The findings indicate that financing costs and market position influence dividend decisions, but firm-specific strategies and industry dynamics may have a stronger influence that overrides these considerations.

#### **The effect of cost of capital on dividend coverage ratio**

First and foremost, the analysis of the dynamic panel variable, represented by the lag of the dividend coverage ratio included in the regression model as an independent variable, revealed a significant negative impact on

the dividend coverage ratio. These findings are of utmost importance as they indicate that previous dividend coverage performance could negatively impact present coverage levels, potentially signaling financial difficulties or alterations in business operations (Mehdi et al., [86]).

Moreover, the cost of debt demonstrated a negative and significant influence on the dividend coverage ratio in both the short and long periods, supporting the study's hypothesis. These findings confirm the alignment of a rise in debt costs with a decrease in the dividend coverage ratio, supporting the bird-in-hand argument. As Michaely and Roberts [89] assert, higher debt costs result in reduced funds for dividend distribution. Consequently, companies may need to cut their dividend payments to efficiently manage their financial obligations.

This discovery has significant implications, suggesting that increased debt expenses can pressure cash flows, reducing dividend coverage. Companies may prioritize fulfilling their debt obligations instead of making dividend payments to retain financial stability and maintain the confidence of creditors [77]. The persistent adverse and substantial impact of debt costs on the dividend coverage ratio, observed over short and long time frames, implies that elevated loan costs might pressure cash flows, resulting in less dividend coverage [51]. Possible factors contributing to this situation may include escalated interest expenses, elevated debt service requirements or concerns regarding preserving creditworthiness [137].

Furthermore, the effect of the cost of equity on the dividend coverage ratio was positive but insignificant in both the short and long periods. The findings do not support the hypothesis of the study. The findings suggest that corporations play a crucial role in satisfying investor expectations by prioritizing dividend payments when stock costs rise, as evidenced by a larger dividend coverage ratio. This statement is consistent with the bird-in-hand theory, which proposes that companies should sustain or enhance dividend payments to satisfy investor expectations for consistent income, even in the face of increased stock costs [5].

Although the needed returns of shareholders might affect dividend decisions, other factors, such as investment possibilities or preferences for capital structure, may have a greater impact than the costs associated with equity [39]. The marginal impact of the cost of equity on the dividend coverage ratio, which is not statistically significant, may be attributed to other prevailing circumstances. Although shareholders' needed returns can have an impact, other factors, such as investment opportunities or strategic decisions on capital structure, might reduce the influence of equity costs on dividend coverage [109].

Moving forward, the WACC exhibited a positive and significant impact on the dividend coverage ratio in both the short and long periods. The findings do support the hypothesis of the study. The results indicate that a rise in WACC is linked to a greater dividend coverage ratio, which supports the bird-in-hand theory. This suggests that even though there are increased capital expenses (debt and equity), companies play a crucial role in prioritizing and distributing dividends to fulfill investors' expectations for consistent income. The theory also justifies the enterprises' decisions to retain or increase dividend payments, especially in the face of growing capital expenses [7]. This demonstrates a dedication to fulfilling investor desires for consistent revenue streams, bolstering shareholder trust and contentment.

These findings indicate that WACC can impact the choices made regarding dividend payouts, indicating financial well-being or adjusting capital allocation strategies to fulfill investor demands [30]. WACC having a positive and significant influence on the dividend coverage ratio in both short and long durations suggests that alterations in WACC can affect decisions regarding dividend payouts. Possible factors may include modifications in capital allocation strategies, endeavors to communicate financial stability to investors or fluctuations in borrowing costs impacting judgments on the total capital structure [40, 42].

Additionally, market share indicated a negative and significant influence on the dividend coverage ratio in short and long periods. Companies with a greater portion of the market may choose to invest more in expansion opportunities rather than distributing dividends to stay competitive and maintain their position as leaders in the market [133]. This might result in a decrease in dividend coverage. The study conducted by Olaniyi and Shah [103] reveals that firms with larger market shares tend to prioritize reinvestment in growth opportunities rather than dividend payouts. This is evidenced by the negative and significant impact of market share on the dividend coverage ratio, in both the short and long term. This may be motivated by strategic choices to sustain competitiveness and market dominance, hence diminishing dividend coverage.

Moreover, the moderating effects of market share on the relationship between the cost of debt and the dividend coverage ratio revealed contrasting impacts. While negatively significant in the short run, the effect became positively significant in the long run. This implies that the relationship between debt expenses and market share can change due to adaptations in funding approaches or market circumstances. The divergent effects of market share on the correlation between the cost of debt and dividend coverage ratio may be attributed to changing financing

tactics or market circumstances. In the shorter term, companies may pay off their debts more to have enough cash available or to deal with urgent financial difficulties [29]. However, a larger market share may indicate better financial well-being in the long term, leading to a more vital ability to pay dividends [123].

Lastly, the moderating effects of market share on the relationships between the cost of equity and WACC with the dividend coverage ratio were positive but insignificant in both periods. This implies that market share may not significantly influence the relationship between equity and capital costs and dividend coverage.

#### **The effect of cost of capital on dividend yield**

Firstly, the analysis of the dynamic panel variable, represented by the lag of dividend yield included in the regression model as an independent variable, revealed an insignificant negative impact on the dividend yield. This suggests that past dividend yield may not significantly influence current dividend yield levels, indicating that other factors may substantially affect dividend payout decisions [100].

Secondly, the cost of debt was found to have a positive and insignificant impact on dividend yield in both the short- and long-run periods. The findings do not support the hypothesis of the study. The results indicate that a rise in the cost of borrowing is linked to a greater dividend yield, which is consistent with the bird-in-hand argument. Brockman and Unlu [28] indicate that even though corporations have to pay more in debt expenses, they continue or raise their dividend payments to satisfy investor expectations for immediate cash, thus improving the dividend yield. The observed positive impact suggests that companies proactively handle their debt financing to guarantee adequate cash flows for distributing dividends. Additionally, this may suggest that companies have enough profitability or cash reserves to handle increased debt expenses while still being able to distribute dividends [25].

Several factors can explain these findings, including advantageous debt terms, strategic financial management and effective cash flow management tactics [125]. These aspects help reduce the influence of debt costs on dividend yield [56]. Alternatively, companies may prioritize dividend payments to uphold investor trust, even in the face of increased costs associated with debt.

Moreover, the cost of equity exhibited a positive and significant impact on dividend yield in both the short- and long-run periods, supporting the study's hypothesis. The research findings strongly support the bird-in-hand argument, suggesting that a rise in the cost of equity is indeed associated with an increase in the dividend yield. According to Dong et al. [44], corporations choose to sustain or enhance dividend payments even when faced



with rising equity costs to satisfy investor expectations for consistent revenue. The positive impact suggests that companies proactively oversee equity financing to secure sufficient funds for dividend payouts. Additionally, these findings suggest that companies have robust profitability or financial reserves to withstand increased equity costs while still being able to distribute dividends [1].

Greater equity costs might result in higher dividend yields as companies aim to meet their shareholders' return expectations [50]. Possible contributing factors to this phenomenon include companies modifying their dividend policy to appeal to potential investors or demonstrating their financial robustness by consistently distributing dividends [65].

Furthermore, the weighted average cost of capital (WACC) had a negative and insignificant impact on dividend yield in both the short- and long-run periods. The findings do not support the hypothesis of the study. When the WACC increases, it can have an adverse effect on the dividend yield. Companies may encounter difficulties continuing dividend payments at the same levels as before [59]. These findings contradict the bird-in-hand theory, which asserts that companies prioritize the provision of stable dividend payments in order to fulfill investor expectations for a reliable source of income. The discovery suggests that companies give more importance to utilizing cash for purposes like paying off debts, making capital investments or funding internal projects than distributing dividends when confronted with increased capital expenses [64]. It may also indicate that companies modify their dividend policy based on financial goals to optimize their capital structure or maintain financial sustainability.

This finding indicates that variations in WACC may not substantially impact judgments regarding dividend payouts. Possible variables contributing to this phenomenon may involve the intricate interaction of numerous elements influencing the WACC, such as fluctuations in borrowing expenses, capital composition or risk characteristics [2, 62]. These factors may not directly correlate with dividend yield variations.

Additionally, market share had a positive and insignificant influence on dividend yield in both the short- and long-run periods. This suggests that having a dominant position in the market or a larger market share does not always lead to higher dividend yields. Possible factors for this phenomenon may include companies giving higher importance to reinvesting in growth prospects rather than distributing dividends to sustain or increase their market presence or dividend policies being influenced by market conditions regardless of market share [105].

Regarding the moderating effect between the cost of debt and market share, it displayed a positive and insignificant impact on dividend yield in the short run but a negative and insignificant impact in the long run. Rafique [108] indicates that the correlation between debt costs and dividend yield is subject to fluctuations over time, which can be attributed to shifts in market dynamics, financial strategy or economic situations.

Lastly, the interaction between the cost of equity and market share had a negative and significant impact on dividend yield in both the short and long run. This finding suggests that firms with higher market share prioritize reinvestment in growth opportunities over dividend distributions, leading to lower dividend yields despite higher equity costs.

The interaction between WACC and market share was observed to have a negative and significant impact on dividend yield in the short run and a positive and significant impact in the long run. This suggests that the relationship between WACC and dividend yield may vary depending on the time horizon, influenced by changes in borrowing costs, investment opportunities or market conditions.

### Assessing the GMM model fitness

The AR (1) test yields a statistically significant result, while the AR (2) test does not achieve statistical significance. This outcome validates the model, and the insignificant result of the AR (2) test highlights the absence of autocorrelation correction [16, 17, 78]). Similarly, the Sargan–Hansen test evaluates the model's overidentifying restrictions. Insignificant Sargan test results suggest the absence of such restrictions, while Hansen test values falling between 10 and 30 also indicate no overidentifying restrictions [113].

However, assessing the Hansen test carefully for results below 10 or above 30 is vital. Values below 10 may indicate potential issues with underidentification, requiring additional instruments, while values exceeding 30 may suggest overfitting, necessitating a review of instrument validity and model complexity [113]. Fortunately, all our model results adhere to these criteria, indicating no overidentifying restrictions and no concerns related to underidentification or overfitting. This outcome instills confidence in the models' robustness and reliability, ensuring they accurately capture the underlying data relationships without introducing biases or limitations associated with overidentifying restrictions, underidentification or overfitting.

Table 7 displays the outcomes of the two-step robustness GMM analysis. This approach addressed endogeneity concerns by introducing lagged independent variables and incorporating the dependent variable as a dynamic

**Table 7** Two-step robustness generalized method of moments (GMM)

Variables	Dividend payout ratio				Dividend coverage ratio				Dividend yield			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
DPO, DCR, DVY (-1)	0.134*** (0.009)	0.134*** (0.009)	0.225*** (0.019)	0.222*** (0.020)	0.220*** (0.013)	0.212*** (0.013)	0.213*** (0.013)	0.216*** (0.013)	0.348*** (0.001)	0.345*** (0.001)	0.348*** (0.001)	0.349*** (0.001)
Cost of debt	0.140 (0.209)	0.087 (0.209)	0.429*** (0.178)	0.400*** (0.181)	-0.213*** (0.030)	-0.198*** (0.030)	-0.215*** (0.031)	-0.208*** (0.030)	-0.060*** (0.022)	-0.070*** (0.023)	-0.011*** (0.001)	-0.023*** (0.001)
Cost of equity	0.012 (0.009)	0.014 (0.009)	0.019* (0.010)	0.014 (0.010)	-0.007*** (0.001)	-0.007*** (0.001)	-0.008*** (0.001)	-0.007*** (0.001)	0.022*** (0.001)	0.022*** (0.001)	0.020*** (0.001)	0.022*** (0.001)
WACC	-0.139 (0.151)	-0.121 (0.153)	-0.364** (0.170)	-0.389*** (0.174)	0.212*** (0.028)	0.219*** (0.029)	0.218*** (0.029)	0.221*** (0.029)	0.015 (0.017)	0.010 (0.018)	0.001 (0.017)	0.001 (0.018)
Market share	0.123*** (0.011)	0.120*** (0.022)	0.127*** (0.026)	0.136*** (0.032)	0.184 (0.391)	0.576 (0.442)	0.273 (0.359)	0.630 (0.451)	0.467*** (0.039)	0.305*** (0.034)	0.383*** (0.032)	0.281*** (0.032)
Cost of debt * Market share		-0.220 (0.430)			-0.150* (0.078)					0.499*** (0.095)		
Cost of equity* Market share			-0.204 (0.147)				0.334* (0.165)				0.119*** (0.013)	
WACC * Market share				-0.202 (0.342)				-0.449 (0.299)				-0.655*** (0.286)
Interest rate	0.480*** (0.215)	0.535*** (0.214)	-0.428*** (0.148)	-0.347*** (0.149)	0.083*** (0.023)	0.097*** (0.023)	0.084*** (0.023)	0.084*** (0.023)	-0.044*** (0.015)	-0.090*** (0.016)	-0.054*** (0.014)	-0.015 (0.001)
Inflation	-0.638*** (0.092)	-0.638*** (0.093)	-0.120* (0.065)	-0.145*** (0.067)	0.013 (0.012)	0.009 (0.012)	0.011 (0.012)	0.011 (0.01)	-0.158*** (0.009)	-0.142*** (0.008)	-0.153*** (0.008)	-0.149*** (0.008)
Exchange rate	-0.067 (0.059)	-0.072 (0.059)	-0.030 (0.049)	0.019 (0.047)	0.002 (0.006)	0.005 (0.006)	0.003 (0.006)	0.004 (0.006)	0.148*** (0.005)	0.158*** (0.005)	0.147*** (0.005)	0.135*** (0.004)
Number of observations	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630
AR (1)	0.001	0.000	0.002	0.000	0.003	0.000	0.005	0.000	0.002	0.004	0.000	0.000
AR (2)	0.423	0.452	0.478	0.507	0.341	0.378	0.389	0.409	0.670	0.689	0.699	0.794
Sargan Test	0.555	0.568	0.598	0.599	0.723	0.735	0.789	0.771	0.801	0.822	0.845	0.791
Hansen Test	0.123	0.128	0.135	0.142	0.221	0.234	0.287	0.290	0.289	0.127	0.256	0/267
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

\*\*\* p<.01, \*\* p<.05, \* p<.1

panel variable. Additionally, it served as a robustness test by integrating three additional variables (interest rate, inflation and exchange rate) to evaluate the robustness of the findings. Unlike the CS-ARDL, which examined findings in both the short and long run, GMM provided an overarching assessment of the results.

#### **The effect of cost of capital on dividend payout ratio**

First and foremost, the study discovered positive and significant impact of including the dividend payout ratio as a dynamic panel variable implies that past dividend payout ratios positively influence current payout decisions. Maintaining consistent dividend policies can bolster investor confidence and their view of the company's financial well-being, which may increase shareholder value [104].

Secondly, the positive but statistically insignificant impact of the cost of debt on the dividend payout ratio suggests that while higher debt costs theoretically could exert pressure on firms to distribute dividends, other overriding factors may influence this relationship [7]. These findings align with previous studies by Jiang and Jiranyakul [68] and Lucky and Akani [81], indicating that firms may prioritize debt servicing or other financial commitments over dividend payments, possibly to maintain financial flexibility or creditworthiness [90]. However, this also implies that excessive reliance on debt financing may not necessarily hinder dividend distributions.

Furthermore, the positive and insignificant effect of the cost of equity on the dividend payout ratio indicates that shareholder expectations for returns may not directly dictate dividend policies. While maintaining shareholder satisfaction is essential, firms may prioritize other strategic considerations, such as investment opportunities or capital allocation priorities. This suggests that firms can maintain flexibility in their dividend policies while pursuing growth and profitability objectives [27].

Moreover, WACC had a negative and insignificant impact on the dividend payout ratio suggests that changes in overall capital costs may not significantly affect dividend distribution decisions. Firms may adjust dividend policies based on factors other than the overall cost of capital, such as profitability, growth prospects or liquidity needs. This implies that companies can maintain dividend stability even in fluctuating market conditions without being overly influenced by changes in capital costs [9].

Lastly, market share's positive and significant influence on the dividend payout ratio suggests that firms with larger market shares strategically use dividends to reward shareholders and maintain market confidence. This may signal financial strength and stability, enhancing investor perception and market positioning. It implies that firms can leverage their market dominance to create shareholder value through dividend distributions [63].

Additionally, the moderation analysis between financing costs and market share, revealing negative and insignificant impacts on the dividend payout ratio, suggests that while the interaction between these factors may influence dividend decisions, their combined effect may not significantly alter dividend policies. Other factors, such as regulatory environments, competitive pressures or internal financial objectives, may have a more pronounced influence. This implies that firms should consider a holistic approach to dividend policy formulation, considering various internal and external factors to maximize shareholder value and maintain financial stability.

#### **The effect of cost of capital on dividend coverage ratio**

First and foremost, the incorporation of the lag of the dividend coverage ratio as a dynamic panel variable in the regression model revealed a significant positive impact on the dividend coverage ratio. This suggests that previous dividend coverage performance significantly influences current coverage levels, indicating continuity or stability in dividend programs. Continuity in this context refers to a financial system's consistent and uninterrupted operation. This stability is important as it instills trust and assurance in investors, which, in turn, can increase the number of investors. Consequently, this can have a positive impact on the performance of stocks [111].

Secondly, the analysis unveiled a substantial negative and significant impact of the cost of debt on the dividend coverage ratio. Increased debt expenses limit companies' capacity to sustain dividend distributions, requiring them to prioritize debt repayment over dividends to preserve financial stability and fulfill obligations to creditors [48]. This constraint could indicate financial hardship to investors, resulting in reduced trust, higher borrowing expenses and even challenges in obtaining funding.

Furthermore, the significant negative impact of the cost of equity on the dividend coverage ratio suggests that firms may face pressure to reduce dividend payouts in response to increased equity costs, potentially to preserve capital or address market uncertainties [45]. This pressure may result in reduced shareholder returns and decreased investor interest in the company's stock.

Moreover, WACC exhibited a noteworthy positive and significant effect on the dividend coverage ratio. Therefore, changes in total capital costs affect decisions regarding dividend payouts, indicating changes in preferences for capital structure or investment strategies to meet investor expectations [58]. Efficiently managing capital costs is essential for maintaining dividend sustainability and instilling confidence in investors, which could enhance the firm's cost of capital and valuation.

Market share emerged as a significant driver of the dividend coverage ratio, with a positive and substantial impact. Firms with larger market shares strategically leverage dividends to reward shareholders and maintain market dominance, enhancing investor confidence and market positioning [20].

Lastly, the moderating effect between the cost of debt and market share revealed a negative and significant impact on the dividend coverage ratio, highlighting the complex interplay between financial metrics and market dynamics. Similarly, the positive and significant moderating effect between the cost of equity and market share suggests that market share may mitigate the adverse impact of increased equity costs on dividend coverage. However, the interaction between WACC and market share yielded a negative and insignificant effect on the dividend coverage ratio, indicating that market share may not significantly influence the relationship between WACC and dividend coverage.

#### **The effect of cost of capital on dividend yield**

First and foremost, incorporating dividend yield as a dynamic panel variable in the regression model revealed a significant positive impact on dividend yield, indicating that past dividend yield performance influences current dividend yields positively. According to Pelcher [106], corporations that consistently increase dividend distributions over time boost investor trust and indicate financial stability. This can attract more investors and improve stock performance.

Secondly, the analysis unveiled a significant negative impact of the cost of debt on dividend yield. Increased debt costs limit firms' capacity to sustain dividend payouts as they prioritize debt servicing to ensure financial stability and fulfill creditor obligations [29]. This restriction could indicate financial difficulties to investors, resulting in less trust, higher borrowing expenses and difficulties financing future expansion efforts.

Furthermore, the cost of equity exhibited a significant positive impact on dividend yield. Although expenses may be higher, companies may still view dividends as a valuable method of involving shareholders. Nevertheless, increased equity expenses could lead to declining shareholder profits, resulting in unhappiness among shareholders or a loss in investor enthusiasm for the company's stock. This could weaken the company's ability to seek funding and support its expansion endeavors [82].

Moreover, the WACC showed a positive but insignificant influence on dividend yield, suggesting that changes in WACC may not significantly affect dividend payouts. Efficiently controlling capital expenses is essential for preserving the ability to pay dividends and ensuring investors' trust. This can have an impact on the overall

value of the company and its long-term stock performance [109].

Lastly, market share emerged as a significant driver of dividend yield. Larger market shares strategically utilize dividends to reward shareholders and maintain market dominance, enhancing investor confidence and market positioning.

Additionally, the moderation analysis revealed that market share may influence the relationship between financing costs and dividend payouts, allowing firms with larger market shares to mitigate adverse effects on dividend yields. However, larger market shares may exacerbate the adverse effects of changes in WACC on dividend payouts, underscoring the importance of managing capital costs and market positioning.

#### **Conclusion**

This study sheds crucial light on the role of the cost of capital in shaping dividend policy decisions among non-financial companies listed on the Frankfurt Stock Exchange. Germany was strategically selected as the focal point of investigation due to its robust economy, well-established financial markets and comprehensive regulatory framework. Collectively, these factors provide an ideal environment for examining how the cost of capital influences dividend policy within a competitive business landscape.

Leveraging Germany's dynamic economy, diverse industries and stringent corporate governance standards, the study aimed to gain valuable insights into the intricate dynamics of financial decision-making within corporations. To achieve this, a purposive sampling strategy was employed, resulting in the selection of 227 non-financial companies listed on the Frankfurt Stock Exchange. The study utilized data from 2005 to 2022 from Thomson Reuters Datastream. Employing two estimation methods, the CS-ARD and GMM, the findings unveiled significant insights into the relationship between the cost of capital and dividend policy.

The results revealed that the cost of debt consistently exerts a negative and significant influence on both the dividend payout ratio and dividend coverage ratio across various time frames. Conversely, although the impact of the cost of equity on these ratios was negative, it remained statistically insignificant. In contrast, the WACC emerged as a significant factor, positively and significantly influencing both the dividend coverage ratio and dividend payout ratio over both short and long periods. Additionally, market share was identified as another critical determinant, consistently demonstrating a positive and significant impact on both the dividend payout ratio and dividend coverage ratio. These findings underscore the importance of considering the cost of capital



and market share dynamics in formulating dividend policies, offering valuable insights for financial decision-makers and stakeholders in navigating dividend-related strategies within corporate settings.

### Managerial implication

Effective debt management is crucial for maintaining dividend payments, as demonstrated by the significant adverse influence of debt expenses on dividend indicators over time and its harmful impact on dividend yield in the short term. It is crucial to swiftly address concerns about the cost of equity to strengthen shareholder trust and promote value development. This is particularly important considering the large negative effect of equity costs on long-term dividend metrics and their favorable impact on short-term dividend yield. Companies' management should prioritize managing their debt structures and closely monitoring the costs of equity in order to guarantee the implementation of sustainable dividend programs.

It is crucial to align dividend policies with managing the overall capital structure. This is evident from the significant impact of the weighted WACC on dividend metrics throughout different periods. Financing decisions must also be aligned with dividend plans to maximize shareholder returns and preserve financial stability. To ensure the long-term sustainability of dividend payments, efficient management should regularly examine the components of WACC and make informed decisions regarding capital allocation.

Effective deployment of dividends to compensate shareholders and strengthen market position is crucial for sustained corporate success. The favorable influence of market share on dividend metrics highlights the significance of utilizing dividends as a means of investor involvement and distinguishing oneself in the market. This strategy approach can develop investor confidence, enhance market competitiveness and promote consistent growth in the changing company environment. Companies should deliberately employ dividends as a component of their investor relations and market positioning strategies to increase shareholder value and improve their position in the market.

### Limitation of the study

Some companies did not have data for the entire year used in this study. This could be attributed to the fact that some companies were incorporated after 2005, resulting in a lack of data for that specific year. As a result, these companies were excluded from the analysis, which limited the sample size to 227. However,

despite the limitation in sample size, it did not significantly impact the study's outcomes or findings.

### Abbreviations

CS-ARDL	Common shock autoregressive distributed lag
GMM	Two-step generalized method of moments
WACC	Weighted average cost of capital

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### Author contributions

RA conceived the study, and downloaded and analyzed the data. LA wrote the introduction and literature. HIMA did the methodology and discussion of the results. HAO did the conclusion, managerial implication and proofreading.

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### Availability of data and materials

The data associated with the study will be made available upon reasonable request from the corresponding author.

### Declarations

#### Ethics approval and consent to participate

Not applicable for secondary data.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare that they have no competing interests.

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