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The Effect of Capital Structure on Profitability and Stock Returns in Banks Listed on The Indonesia Stock Exchange, 2021-2025

Januar Afrino[1]*, Listiana Sri Mulatsih[2], Sefrimel Angriani Zn[3]
[1]*Universitas Pasir Pengaraian, Indonesia*
[2]*Universitas Bung Hatta, Indonesia*
[3]*Universitas Negeri Jakarta, Indonesia*

Abstract

This study examines the effect of capital structure on profitability and stock returns among banking companies listed on the Indonesia Stock Exchange during the 2021-2025 period. Capital structure is proxied by the Debt-to-Equity Ratio (DER), profitability is proxied by Return on Equity (ROE), and stock returns are measured using annual stock returns. The study applies an explanatory quantitative approach using balanced panel data from 12 banks over five years, yielding 60 bank-year observations. The model is estimated without control variables in order to remain consistent with the conceptual framework, which positions DER as the independent variable, ROE as the profitability variable, and stock returns as the market-based dependent variable. The estimation results show that DER has a significant negative effect on ROE, DER has a significant negative effect on stock returns, and ROE has a significant positive effect on stock returns. These findings indicate that a bank's capital structure is not only associated with shareholder profitability but also with the market's response to banking stocks.

Keywords: capital structure; DER; profitability; ROE; stock returns

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**Corresponding author: januarafrino.95@gmail.com*

Introduction

Profitability and stock returns are two important indicators for evaluating the performance of banking companies. Profitability reflects a bank's ability to generate earnings from the resources it manages, whereas stock returns represent the gains received by investors from holding shares. In the banking industry, profitability is not merely an accounting measure of income; it also reflects the effectiveness of capital management, the quality of intermediation, asset quality, and the bank's ability to sustain market confidence. Stock returns, in turn, reflect how investors assess a bank's prospects based on financial performance, risk exposure, funding policy, and expectations of future growth (Le & Phan, 2017; Tran et al., 2022).

In this study, profitability is proxied by Return on Equity (ROE) because ROE captures the rate of return earned by shareholders on the equity invested in the bank. ROE is particularly relevant for listed banks because investors tend to evaluate banking performance by examining how effectively management converts shareholder capital into earnings. The use of ROE also aligns with the unique characteristics of the banking sector, where liabilities, especially third-party funds and other obligations, dominate the funding structure and support the bank's intermediation function. Consequently, changes in capital structure can be reflected directly in shareholder returns and in the market's perception of bank stocks (Goddard et al., 2004; Menicucci & Paolucci, 2016; Ahamed, 2021).

Capital structure in this study is proxied by the Debt-to-Equity Ratio (DER). DER is selected because it measures the proportion of total liabilities relative to total equity, thereby indicating the degree to which a bank relies on obligation-based financing compared with its own capital. In the banking sector, DER is particularly meaningful because banks naturally operate with high leverage.

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However, an excessively high DER may increase perceived risk, reduce the bank's capacity to absorb losses, and weaken investor confidence in the sustainability of profitability. Conversely, a well-managed DER may expand a bank's ability to channel funds productively and generate returns for shareholders (Berger et al., 1995; Gropp & Heider, 2010; DeAngelo & Stulz, 2015).

The Indonesian banking industry during the 2021-2025 period was marked by post-pandemic recovery, interest rate adjustments, industry consolidation, and stronger capital regulation. Bank Indonesia gradually raised its policy rate after the pandemic to maintain exchange rate stability and control inflation, making changes in funding costs a major challenge for the banking industry (Bank Indonesia, 2024). At the same time, the Financial Services Authority strengthened capital supervision and governance through regulations that require banks to maintain capital quality and follow prudential principles (OJK, 2021; OJK, 2024). These conditions highlight the importance of capital structure in maintaining both bank stability and profitability.

The development of banking stocks also shows that market performance does not always move in line with aggregate industry fundamentals. Investors consider not only the level of earnings, but also the risk embedded in the funding structure, the bank's ability to generate returns on equity, and the outlook for future profit growth. Excessive leverage may reduce stock returns because the market often interprets leverage as an additional source of financial risk (Vo & Le, 2017). Similarly, capital structure decisions are closely related to bank stock returns because investors use funding structure as a signal of risk and corporate prospects (Tran et al., 2022). For this reason, the effect of DER on stock returns needs to be examined together with ROE as a measure of shareholder-oriented profitability.

Empirical studies on the relationship among capital structure, profitability, and stock returns have produced mixed findings. Previous studies have reported inconsistent findings regarding the effect of leverage on bank performance. Leverage may enhance profitability through the financial leverage effect when borrowed funds are utilized efficiently (Le & Phan, 2017; Berger & Bouwman, 2013). However, excessive leverage may increase financial risk, funding costs, and investors' risk perceptions, thereby reducing profitability and stock returns (Ahamed, 2021; Tran et al., 2022; Nguyen & Nguyen, 2023). Research on ASEAN banks confirms that capital structure affects bank performance, while Indonesian evidence shows that DER is relevant in explaining ROE and banking stock returns (Nguyen & Nguyen, 2023; Widodo & Mahmud, 2023). These mixed findings create the need to re-examine the relationship among DER, ROE, and stock returns using more recent data, particularly in the post-pandemic period and within the Indonesian capital market context.

Based on this background, the research gap lies in the need for updated empirical evidence on the effect of DER on ROE and stock returns among banks listed on the Indonesia Stock Exchange during 2021-2025. Previous studies often used several proxies for capital structure and profitability simultaneously, making the relationship among the core variables less focused. Therefore, this study simplifies the model by using DER as the sole proxy for capital structure and ROE as the proxy for profitability. This specification is intended to sharpen the theoretical link between capital structure, shareholder profitability, and stock returns in accordance with the proposed conceptual framework.

The novelty of this study lies in its more specific model, which examines the effect of DER on ROE, the effect of DER on stock returns, and the effect of ROE on stock returns. The model positions ROE as a profitability measure that connects the financial logic of capital structure decisions with market response. In the Indonesian banking context during 2021-2025, which reflects post-pandemic recovery, changes in interest rates, and adjustments in capital regulation, this study is expected to enrich the literature on bank capital structure, provide practical insights for bank management in maintaining healthy leverage, assist investors in assessing risk and banking stock prospects, and offer useful information for regulators regarding the relevance of capital structure to market performance.

The relationship between capital structure, profitability, and stock returns has been widely examined, empirical findings remain inconclusive. Trade-off Theory suggests that debt can enhance firm value through tax benefits but may reduce profitability when financial distress costs increase (Modigliani & Miller, 1963; Myers, 1984). In the banking sector, previous studies have reported

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inconsistent results regarding the effect of leverage on profitability and stock returns (Le & Phan, 2017; Nguyen & Nguyen, 2023; Tran et al., 2022). Moreover, most studies employ multiple leverage and profitability proxies, making it difficult to isolate the specific effect of the Debt-to-Equity Ratio (DER) on shareholder profitability and market performance. Empirical evidence focusing on Indonesian listed banks during the post-pandemic period (2021–2025) also remains limited. Therefore, this study addresses these gaps by employing a parsimonious model that examines the direct relationships among DER, Return on Equity (ROE), and stock returns using balanced panel data. This approach provides updated evidence on how capital structure influences both accounting performance and market performance under recent regulatory and economic conditions, thereby extending the literature on banking capital structure and investor decision-making (Berger & Bouwman, 2013; Gambacorta & Shin, 2018).

Accordingly, this study aims to analyze the effect of DER on ROE, the effect of DER on stock returns, and the effect of ROE on stock returns among banking companies listed on the Indonesia Stock Exchange during the 2021–2025 period.Accordingly, this study aims to analyze the effect of DER on ROE, the effect of DER on stock returns, and the effect of ROE on stock returns among banking companies listed on the Indonesia Stock Exchange during the 2021-2025 period. These objectives are derived from the conceptual framework, which places Capital Structure (DER) as the independent variable, Profitability (ROE) as the profitability variable, and Stock Returns as the market-based dependent variable.

Literature Review

Modern capital structure theory began with Modigliani and Miller, who argued that in a perfect market a firm's value is not affected by its capital structure. However, when taxes, bankruptcy costs, and information asymmetry are considered, financing decisions become relevant to firm value and performance (Modigliani & Miller, 1958; Modigliani & Miller, 1963). In the banking sector, this theory must be interpreted carefully because bank liabilities are not merely sources of financing; they are also part of the intermediation process.

Trade-off theory explains that firms choose capital structure by balancing the benefits of debt against the costs of financial distress. In banking, a higher DER may increase financing capacity and the potential return on equity, but it may also intensify liquidity risk, solvency risk, and regulatory compliance costs. Stronger bank capital improves the ability of banks to survive during crises, while stronger capital is also associated with lower funding costs and better long-term performance (Berger & Bouwman, 2013; Gambacorta & Shin, 2018).

Pecking order theory explains that firms generally prefer internal financing, followed by debt, and finally new equity issuance because of information asymmetry. For banks, this theory is relevant because retained earnings and core capital are important sources for strengthening equity and sustaining market confidence. Banks that generate high ROE have greater capacity to reinforce capital through retained earnings; therefore, capital structure may also serve as a signal of financial quality (Myers, 1984; Myers & Majluf, 1984; DeAngelo & Stulz, 2015).

Agency theory explains that capital structure can influence the relationship among shareholders, managers, creditors, depositors, and regulators. A high DER may discipline managers because debt obligations impose financial commitments, but it may also encourage greater risk-taking. In banking, agency issues are more complex because banks manage public funds and operate under regulatory supervision. Thus, DER should not be viewed only as a funding ratio, but also as a risk indicator that may influence ROE and stock returns (Jensen & Meckling, 1976; Flannery, 2016).

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Signaling theory suggests that published financial information provides signals to investors. A high DER may be interpreted as a risk signal when rising liabilities are not followed by stronger profitability. In contrast, a high ROE may send a positive signal because it indicates that a bank is able to generate earnings for shareholders. Since the capital market responds to fundamental signals, DER and ROE may affect stock returns through investor perceptions of risk and expected gains (Fama & French, 1993; Tran et al., 2022).

Bank capital structure in this study is measured using the Debt-to-Equity Ratio (DER), calculated by dividing total liabilities by total equity. This ratio indicates how large a bank's obligations are relative to its own capital. A higher DER reflects greater dependence on liabilities. Although high leverage is common in the banking industry, it must still be managed carefully to avoid excessive risk pressure (Gropp & Heider, 2010; Nguyen & Nguyen, 2023).

Profitability is proxied by Return on Equity (ROE), calculated by dividing net income after tax by total equity. ROE is selected because this study focuses on the shareholder perspective of profitability. In capital markets, investors commonly pay attention to ROE because it shows the firm's ability to generate returns on invested capital. ROE is also closely related to capital structure because changes in liabilities and equity can affect the rate of return earned by shareholders (Menicucci & Paolucci, 2016; Ahamed, 2021; Mehmood et al., 2024).

Stock returns represent the gains received by investors from changes in stock prices and dividends. In this study, stock returns are measured using the holding period return, calculated as the difference between the end-of-period stock price and the beginning-of-period stock price plus dividends, divided by the beginning-of-period stock price. This measurement captures the gain or loss received by investors over a single holding period (Fama & French, 1993; Tran et al., 2022).

The conceptual framework of this study is built on the relationship among capital structure, profitability, and stock returns. Capital Structure, proxied by DER, is assumed to affect Profitability, proxied by ROE. DER is also assumed to have a direct effect on Stock Returns, while ROE is assumed to affect Stock Returns because the market tends to respond to a bank's ability to generate earnings for shareholders (Vo & Le, 2017; Tran et al., 2022; Widodo & Mahmud, 2023).

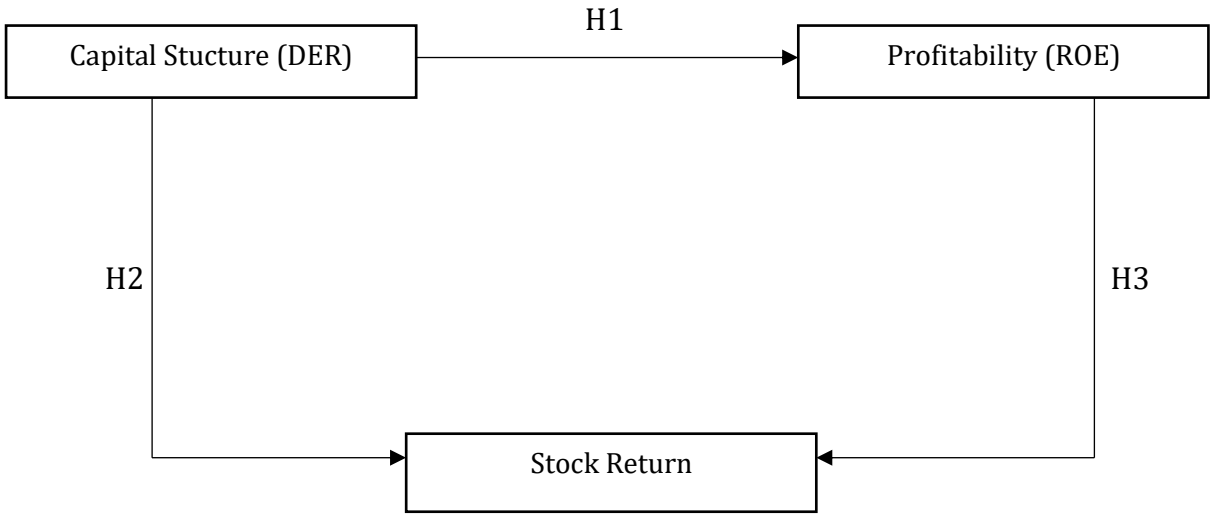

Figure 1. Conceptual Framework

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Hypothesis Development

The effect of DER on ROE can be explained through capital structure theory and the financial leverage effect. A higher DER indicates greater use of liabilities relative to equity. On the one hand, leverage may increase shareholder returns when the financed assets generate earnings that exceed funding costs. On the other hand, excessive leverage may reduce ROE when financial risk and funding costs increase. Based on trade-off theory and prior empirical evidence, the first hypothesis is formulated as follows:

H1: Capital Structure (DER) affects Profitability (ROE) in banks listed on the Indonesia Stock Exchange during the 2021-2025 period.

DER may also affect stock returns because investors interpret capital structure as a signal of risk. Banks with high DER may be perceived as having greater financial risk, prompting the market to assign a lower valuation. However, if leverage is managed effectively and generates strong ROE, investors may respond favorably. Based on this argument, the second hypothesis is formulated as follows:

H2: Capital Structure (DER) affects Stock Returns in banks listed on the Indonesia Stock Exchange during the 2021-2025.

ROE reflects a bank's ability to generate returns for shareholders. The higher the ROE, the stronger the profitability signal received by investors. In the capital market, strong profitability can increase investor interest and contribute to stock returns. Therefore, the third hypothesis is formulated as follows:

H3: Profitability (ROE) affects Stock Returns in banks listed on the Indonesia Stock Exchange during the 2021-2025 period.

Methods

This study uses an explanatory quantitative approach with secondary data in the form of panel data. The quantitative approach is appropriate because the study aims to test relationships among variables that can be measured numerically. Panel data are used because the study observes several banks across multiple years, allowing it to capture both cross-sectional and time-series variations (Creswell & Creswell, 2018; Sekaran & Bougie, 2019; Baltagi, 2021; Wooldridge, 2019).

The population consists of banking companies listed on the Indonesia Stock Exchange during the 2021-2025 period. The sample is determined using purposive sampling based on the following criteria: the bank is listed on the Indonesia Stock Exchange, publishes financial statements consecutively, does not report losses during the observation period, and has complete data on DER, ROE, and stock returns. Based on the research workbook, the final sample consists of 12 banks observed over five years, resulting in 60 bank-year observations.

Data are collected through documentation of annual financial statements, company annual reports, Indonesia Stock Exchange statistics, publications from the Financial Services Authority, publications from Bank Indonesia, and stock price data sources. The research instrument is a secondary-data documentation sheet. Data validity is maintained by using official sources and consistent formulas, while reliability is maintained through the use of a balanced panel and uniform ratio measurement for each bank-year observation (Cooper & Schindler, 2018).

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Table 1. Operationalization of Research Variables

Variable	Type	Proxy	Scale
Capital Structure	Independent	DER	Ratio
Profitability	Dependent/Intervening	ROE	Ratio
Stock Returns	Dependent	Annual Stock Return	Ratio

Data analysis includes descriptive statistics, correlation analysis, and panel data regression without control variables. The use of a model without control variables is intentional and is based on the primary objective of this study, which is to examine the direct relationships among capital structure (DER), profitability (ROE), and stock returns as specified in the conceptual framework. Including additional firm-specific or macroeconomic control variables could obscure the direct effects of the main variables and introduce competing explanations beyond the scope of the study. This parsimonious model is therefore appropriate because the research is designed as a theory-driven hypothesis test focusing on the direct associations among the core constructs rather than on developing a comprehensive prediction model. Similar approaches have been adopted in explanatory studies that prioritize testing theoretically specified relationships among a limited number of variables (Creswell & Creswell, 2018; Sekaran & Bougie, 2019). Nevertheless, future studies may incorporate firm-specific characteristics and macroeconomic variables to assess the robustness of the relationships identified in this study. The research models are specified as follows.

$$ROE_{it}=\alpha+\beta 1 DER_{it}+\varepsilon_{it}$$

$$StockReturn_{it} = \alpha + \beta_1 DER_{it} + \beta_2 ROE_{it} + \varepsilon_{it}$$

Results and Discussion

The research sample consists of 12 banks observed during the 2021-2025 period, resulting in 60 bank-year observations. The panel model selection procedure was conducted to determine the most appropriate estimation model. The Chow test rejected the Common Effect Model in favor of the Fixed Effect Model ($p < 0.05$). Subsequently, the Hausman test indicated that the Fixed Effect Model was more appropriate than the Random Effect Model ($p < 0.05$). Therefore, the Fixed Effect Model was selected for estimating the relationship between capital structure, profitability, and stock returns.

The data form a balanced panel because each bank has complete observations for all five years. The results are presented using the revised variables: DER as the proxy for capital structure, ROE as the proxy for profitability, and stock return as the measure of market return.

Table 2. Descriptive Statistics of Main Variables

Variable	N	Mean	Median	Std. Dev.	Minimum	Maximum
DER	60	6.1828	5.9115	1.6832	4.2520	11.4900
ROE (%)	60	14.1238	15.2550	4.6838	1.8000	20.6600
Stock Return	60	0.0987	0.1220	0.1753	-0.4001	0.4007

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The mean DER of 6.1828 indicates that the liabilities of the sampled banks are greater than their equity. The mean ROE of 14.1238% indicates that the sampled banks generally generated positive returns on equity. The mean stock return of 0.0987 indicates that the average annual stock return was approximately 9.87%.

Table 3. Correlation Matrix

Variable	DER	ROE	Stock Return
DER	1.0000	-0.8416	-0.8294
ROE	-0.8416	1.0000	0.8613
Stock Return	-0.8294	0.8613	1.0000

The correlation matrix shows that DER is negatively correlated with ROE and stock returns, whereas ROE is positively correlated with stock returns. These correlations indicate the initial direction of association and are not used as the sole basis for causal inference.

Table 4. Regression Results for Model 1: DER and ROE

Variable	Coefficient	Std. Error	t-statistic	p-value	Decision
Constant	28.6044	1.2640	22.635	<0.001	Significant
DER	-2.3421	0.1973	-11.869	<0.001	Negative and significant

Model 1 produces an R-square of 0.7084 and an adjusted R-square of 0.7034. The F-statistic is 140.9 with a p-value below 0.001, indicating that the model is statistically significant. The DER coefficient of -2.3421 with a p-value below 0.001 indicates that DER has a significant negative effect on ROE.

Table 5. Regression Results for Model 2: DER, ROE, and Stock Returns

Variable	Coefficient	Std. Error	t-statistic	p-value	Decision
Constant	0.0335	0.1300	0.257	0.798	Not significant
DER	-0.0373	0.0120	-3.109	0.003	Negative and significant
ROE	0.0210	0.0043	4.859	<0.001	Positive and significant

Model 2 produces an R-square of 0.7790 and an adjusted R-square of 0.7720. The F-statistic is 100.7 with a p-value below 0.001, indicating that the model is statistically significant. The DER coefficient of -0.0373 with a p-value of 0.003 indicates that DER has a significant negative effect on stock returns. The ROE coefficient of 0.0210 with a p-value below 0.001 indicates that ROE has a significant positive effect on stock returns.

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Table 6. Summary of Hypothesis Testing

Hypothesis	Relationship	Coefficient	p-value	Decision	Finding
H1	DER -> ROE	-2.3421	<0.001	Supported	DER has a significant negative effect on ROE.
H2	DER -> Stock Return	-0.0373	0.003	Supported	DER has a significant negative effect on stock returns.
H3	ROE -> Stock Return	0.0210	<0.001	Supported	ROE has a significant positive effect on stock returns.

DISCUSSION

The results show that DER has a significant negative effect on ROE. This finding indicates that a greater reliance on liabilities within the research sample is associated with lower returns on equity. Theoretically, this result can be explained through trade-off theory, which suggests that higher leverage may increase risk pressure and funding costs, so the benefits of financial leverage do not always improve shareholder profitability. This finding is consistent with the argument that bank capital structure must be maintained at a healthy level in order not to weaken profitability (Berger & Bouwman, 2013; Gambacorta & Shin, 2018; Nguyen & Nguyen, 2023).

DER also has a significant negative effect on stock returns. This suggests that the market tends to interpret high bank leverage as a risk signal. Investors may perceive a high DER as an indication of greater financial risk because Indonesian banks operate under strict prudential regulations requiring adequate capital and effective risk management. During the 2021–2025 period, which was characterized by post-pandemic recovery, higher interest rates, and tighter regulatory supervision by the Financial Services Authority (OJK) and Bank Indonesia, banks with higher leverage were more vulnerable to increasing funding costs and lower flexibility in absorbing potential credit losses. Consequently, the market tended to discount the value of highly leveraged banks, resulting in lower stock returns. This finding supports Signaling Theory, which argues that capital structure conveys information about a firm's financial condition and future prospects to investors (Ross, 1977), and is consistent with previous evidence that excessive leverage negatively affects banking stock performance in emerging markets (Tran et al., 2022; Nguyen & Nguyen, 2023).

In contrast, ROE has a significant positive effect on stock returns. This finding indicates that the market responds positively to shareholder profitability. Banks that generate higher ROE are perceived as having a stronger ability to create value for shareholders. Therefore, ROE can function as an important fundamental signal in the formation of stock returns. This result supports the view that profitability is one of the key factors investors consider when evaluating banking stocks (Ahamed, 2021; Mehmood et al., 2024).

The theoretical contribution of this study is that it strengthens the relevance of trade-off theory and signaling theory in explaining the relationship among DER, ROE, and stock returns in the Indonesian banking sector. The practical contribution is that it provides guidance for bank management to maintain DER at a level that does not undermine profitability or market perception. For investors, the findings highlight the importance of considering DER and ROE in fundamental analysis of banking

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stocks. For regulators, the results suggest that a sound capital structure is not only important for banking stability but is also related to market confidence.

The main limitation of this study is that it uses a limited sample and data that remain in the form of processed/proxy research data. Therefore, further validation against annual financial statements, Indonesia Stock Exchange data, Financial Services Authority data, and official stock price sources is necessary before the manuscript is used for final publication. Future research may expand the sample, use audited final data, formally test fixed-effect or random-effect panel models, and include macroeconomic variables if the research objective is broadened.

Conclusions

This study examines the effect of capital structure, proxied by DER, on profitability, proxied by ROE, and stock returns among banks listed on the Indonesia Stock Exchange during the 2021-2025 period. Based on the empirical results, DER has a significant negative effect on ROE, DER has a significant negative effect on stock returns, and ROE has a significant positive effect on stock returns.

These findings indicate that capital structure plays an important role in explaining both profitability and market response in the banking sector. A high DER may be perceived as an increase in risk and is associated with lower ROE and lower stock returns. Conversely, higher ROE sends a positive signal to investors because it reflects a bank's ability to generate returns for shareholders. Accordingly, banks need to maintain a sound capital structure so that profitability and market confidence can be sustained.

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