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Capital Structure Effects: The Role of Sales Growth in Shaping Firm Performance Across Southeast Asia

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ABSTRACT

Purpose: This study aims to explore the relationship between capital structure and firm performance among listed firms in Southeast Asia and examines whether sales growth changes that relationship, a topic in response to the lack of studies focused on this region.

Method: This study uses an unbalanced panel dataset of 4,229 listed firms in Southeast Asia, including Indonesia, Malaysia, the Philippines, Thailand, Singapore, and Vietnam from 2019 to 2023. The study employed panel data regression analysis with Stata 19.

Findings: The findings show important patterns in capital structure and performance. Leverage to equity consistently shows a negative relationship with ROA, ROE, and Tobin's Q, indicating its detrimental effect on performance. Leverage to assets produces mixed results, while market value leverage is mostly positive. Sales growth plays a moderating role by strengthening the positive and significant impact of market value leverage on performance and reshapes other relationships. These results highlight the complexity of capital structure decisions and the influence of sales growth on capital structure and firm performance relationship in Southeast Asia

Implications: This research extends the trade-off theory by empirically showing that the optimal capital structure is a quantifiable result influenced by various leverage mechanisms. Sales growth becomes as a critical moderator, strengthening a firm's ability to manage financial risk and shift the trade-off point toward more favorable leverage. This implies that capital structure does not remain fixed; it moves with growth expectations. Practically, firms with higher sales growth likely to adjust leverage when conditions change, which in turn reduces the likelihood of financial risks.

Novelty/Value: This research introduces a new perspective by examining sales growth as a moderating factor in the relationship between capital structure and firm performance. Additionally, by using multiple measures of performance (ROA, ROE, Tobin'S Q) and capital structure (LE, LA, MVL) in the context of emerging markets, the research offers insights that are both new and practical.

Keywords: Capital structure, financial risks, firm performance, sales growth, trade-off theory, Southeast Asia.

INTRODUCTION

The performance of a firm serves as a significant metric for assessing its profitability, long-term sustainability, and competitive positioning, demonstrating its capacity to generate revenue, manage resources effectively, and provide returns to shareholders. It is essential for stakeholders, including investors, management, and policymakers, who are interested in understanding the factors behind the firm's return and sustainability of the firm. A firm's effectiveness in using assets and equity to generate returns, measured via key financial ratios such as return on assets (ROA) and return on equity (ROE) (Ferriswara, Sayidah, & Agus Buniarto, 2022; Ronoowah & Seetanah, 2024). Studies in accounting and finance highlight the multifaceted nature of firm performance and emphasize capital structure as an element frequently examined in academic literature. Researchers then define capital structure as the proportional funding model that combines debt and equity (Ankamah-Yeboah, Nielsen, & Llorente, 2021; Ngatno, Apriatni, & Youlianto, 2021; Tian, Wang, & Kohar, 2024). The capital structure which combine debt and equity financing, is a critical accounting and finance issue with the potential to influence firm performance (Abdullah & Tursoy, 2021).

The strategic allocation of a firm's capital using a blend of financing sources is a decision of considerable consequence; it could significantly affect a firm's performance, with notable effects on performance metrics, including ROA and ROE. Management at firm-level aims to implement policies, including the structure of firms' capital policy, intended for increasing performance (Tanko, Siyanbola, Bako, & Dotun, 2021). It comprises the diverse funding sources used by a firm, such as debt, earnings reserves, and owner's equity. These diverse funding sources fall under debt and equity financing. A blended structure of firms' capital allows firms access to the advantages of each financing. A structured capital mix enhances performance, market valuation, and reduces the cost of capital; conversely, an unsuitable structure of a firm's capital can negatively affect profitability and increase financial risk (Ngatno et al., 2021; Ronoowah & Seetanah, 2024). To achieve a financially optimal structure, firms must evaluate the trade-offs inherent in debt and equity financing, considering their unique financial objectives and risk tolerance.

A multitude of hypotheses offer theoretical explanations for the observed relationship between the structure of a firm's capital and its performance. The Modigliani-Miller (MM) theorem, comprising two propositions, accounts for this correlation (Modigliani & Miller, 1958, 1963). The proposition suggests that in perfectly competitive markets, a firm's market valuation does not change based on its capital structure (Abdullah & Tursoy, 2021; Ronoowah & Seetanah, 2023; Wang & Huang, 2021). The second proposition posits a direct correlation between increasing leverage and the cost of equity, a consequence of the amplified risk to equity holders (Wang & Huang, 2021). The MM Theorem subsequently established a crucial theoretical framework, significantly affecting the structure of corporate capital theories, including the trade-off theory. It acknowledged the necessity and potential for optimizing the structure of firms' capital (Spitsin, Vukovic, Spitsina, & Özer, 2022). Considering this, theoretical frameworks have spurred empirical research in accounting and finance on the correlation between the structure of firms' capital and its performance, highlighting a significant impact of financing decisions on firms' financial and operational effectiveness. Published research has yielded three distinct correlations between the structure of a firm's capital and its performance. Empirical findings suggest an association which is positive between the structure of firms' capital and its operational performance (Abdullah & Tursoy, 2021; Ahmed, Nugraha, & Hágen, 2023), while other studies show a negative relationship (Candy & Quinn, 2023; Dodoo, Kumi, & Mangudhla, 2023; M N, Shenoy, Chakraborty, & B M, 2024). Previous studies have revealed a curvilinear correlation, specifically a U-shaped pattern, between leverage and firm performance, showing the conditional nature of leverage's effect based on debt levels (Ankamah-Yeboah et al., 2021; Ayaz, Mohamed Zabri, & Ahmad, 2021; Tian et al., 2024). These contrasting findings suggest that the relationship is not the same and may vary in different contexts and firm-specific factors that have not been fully examined.

A broader gap in the literature concerns the lack of attention to interaction effects that could explain why capital structure influences performance differently across firms. Many studies assume a direct relationship (Abdullah & Tursoy, 2021; Candy & Quinn, 2023; Dodoo et al., 2023), which may overlook how firm-specific characteristics might alter this relationship. Growth is one characteristic that deserves attention and that may influence this relationship. Sales growth reflects expansion and

prospects, and it often leads to financing needs and risk-taking. Therefore, growth can influence financing choices or leverage (Spitsin et al., 2022). This implies that firms experiencing sales growth often use leverage to finance growth, which can improve performance, but it can also increase financial difficulties if improperly managed. Despite its importance, empirical evidence on whether sales growth moderates the relationship between capital structure and firm performance remains rare.

The lack of research becomes more pronounced in Southeast Asia, because most prior studies have focused on developed market and individual country analyses (Abdullah & Tursoy, 2021; Luu, 2021; M. N., Shenoy, Chakraborty, & B. M., 2024; Mathur, Tiwari, Sita Ramaiah, & Mathur, 2021; Ronoowah & Seetanah, 2024; Tanko et al., 2021), making it ungeneralized whether it effects also persist in Southeast Asian firms. Addressing both the moderating role of sales growth and the regional context offers an opportunity to enrich the literature and provide evidence that reflects this relationship within emerging markets.

There are few reasons for choosing Southeast Asia region. First, that Southeast Asia nation has the distinction of being the world's fourth-largest economy in 2024 (Ing, 2024). Second, the distinct structural issues inherent in each Southeast Asia country led to differentiated effects on the revenues, expenditures, and profitability of its businesses (Bawono, Handika, & Surya Rahmajati, 2025). Third, the collectivist norm practiced by Southeast Asia firms in their management, along with these countries' weak external governance, results in a deficient legal system for protecting minority interests and controlling firms (Meishan Chua, Nazrul Hisyam Ab Razak, Annuar Md Nassir, & Mohamed Hisham Yahya, 2021). These conditions make the region suitable for studying how capital structure decisions affect firm performance, per trade-off theory, especially when sales growth moderates this effect in situations where internal factors often outweigh external constraints.

The trade-off theory posits that firms aim for an ideal capital structure, balancing the expenses of financial difficulty and agency problems linked to high leverage with the tax benefits of debt (Abdullah & Tursoy, 2021; Bui, Nguyen, & Pham, 2023). However, this equilibrium remains subject to external influences, among which sales growth is a notable factor affecting the relation. Empirical evidence suggests the relationship is negatively impacted by an increased firm growth rate, as shown by sales change (M. N. et al., 2024). Conversely, some research suggests that sales growth directly correlates with profits, inevitably improving profitability (Nazir, Azam, & Khalid, 2021). It postulates that substantial sales growth is vital to the firm's performance, operational effectiveness, and market competitiveness. Sales growth influences the structure of firms' capital (Al-Haddad, Saidat, Seaman, & Gerged, 2024; Spitsin et al., 2022) by affecting its ability to manage debt and attract equity investment. Therefore, comprehending the interaction of sales growth and a firm's structure of capital and its effect on firm performance is essential to explain this intricate relationship and to offer strategic insights for firms in diverse market conditions, including those operating in Southeast Asia nations. This research seeks to understand how sales growth shapes the relationship between capital structure and firm performance, exploring whether this role changes when the relations are viewed through different measures.

This study aims to fill a gap in the existing literature by assessing the impact of capital structure on firms' performance in Southeast Asia countries, with additional focus on the moderating role of sales growth. Trade-off theory provides essential understanding in evaluating this relationship, suggesting that firms aim to optimize their structure of firms' capital by balancing the advantages derived from debt financing with the costs associated with equity financing (Frank & Goyal, 2009; Kraus & Litzenberger, 1973). This theoretical framework posits that improved firm performance is attainable through the strategic management of leverage (structure of firms' capital), strengthening market competitiveness. By examining the leverage to equity, leverage to assets, and market value leverage, this research offers a thorough examination of the structures of firms' capital metrics interact with sales growth to affect firms' performance.

This research will contribute in several ways. First, this research begins by addressing a region that has received limited attention in prior studies, examining how firms' capital structure relates to performance within Southeast Asia's economic context. Second, this study also introduces sales growth as a moderating variable, responding to gaps in earlier work that influences this relationship. Third, using a rigorous empirical framework and focusing on established multiple capital structure and

performance measures, the research provides deeper insights into the interaction between sales growth, capital structure, and firm performance. The analysis is limited to listed firms in Southeast Asia from 2019 to 2023, ensuring that the findings reflect market conditions and trends. Finally, the result offers practical guidance to managers and policymakers in Southeast Asia, enabling them to make financial choices that boost firm performance and competitiveness in a rapidly changing economic environment. By integrating the often-overlooked variable of sales growth, this study advances the discussion on capital structure and creates a foundation for future research to explore similar interactions in other developing economies.

The remainder of this research article follows a systematic structure. Section 2 reviews the previous literature and develops the hypotheses that frame the analysis. In Section 3, the discussion turns to the research method, describing the data sample, defining operational variables, and explaining the econometric model applied in the study. Section 4 then goes into the results and discussion, presenting the statistical results and a discussion that relates them to the objectives of the research. Finally, Section 5 closes the paper with a conclusion of the research that includes practical implications, acknowledging limitations, and suggesting directions for future research.

LITERATURE REVIEW

Trade-off Theory

Trade-off theory (TOT) constitutes one of the most influential contributions of M&M (Kraus & Litzenberger, 1973). The literature posits a balancing act for firms; higher debt offers tax advantages but also increases the risk of financial trouble (Bui et al., 2023). The theory suggests that while debt financing increases tax savings, it also increases risk exposure. Following this, TOT incorporates the concept of weighing both the costs and benefits for its financing decision on the structure of firms' capital (Myers, 1977).

Building upon the Modigliani-Miller framework, according to TOT, firms seek an equilibrium in the structure of firms' capital by weighing the benefits and costs associated with debt and equity financing. The TOT posits that the tax benefits stemming from the tax-deductible nature of interest payments on debt render debt financing more favorable for companies. This represents a beneficial strategy for profitable firms, leveraging debt financing to pursue growth opportunities. Increased firm leverage, while strategically benefiting, proportionally increases the likelihood of financial distress, resulting in higher bankruptcy-related costs and diminished operational flexibility (Kraus & Litzenberger, 1973). Consequently, firms need to assess the marginal benefits from additional debt with the potential financial risks in determining their ideal capital composition.

Capital Structure and Firm Performance

Substantial studies confirm a substantial association between capital structure and its financial performance, because of balancing tax advantages against the risk of financial hardship (Abdullah & Tursoy, 2021; Bui et al., 2023; Neves, Proença, & Dias, 2020). The theoretical framework of trade-off theory posits the existence of an optimal capital structure for firms. Optimum level for the structure of firms' capital exhibits dynamism and varies across firms, influenced by disparities in profitability, risk tolerance, growth opportunities, and industry dynamics (Attia, Ezz Eldeen, & Daher, 2023; M N et al., 2024; Sikveland, Xie, & Zhang, 2022; Spitsin, Vukovic, Anokhin, & Spitsina, 2020). According to TOT, the optimal structure of a firm's capital represents the equilibrium point where incremental benefits of debt financing are neutralized by the incremental risks. Researchers use trade-off theory to posit a positive correlation on the relationship between the structure of firms' capital and their performance (Mathur et al., 2021; Neves et al., 2020; Spitsin et al., 2020).

The empirical findings suggest that firms may improve earnings through debt financing, leveraging tax benefits and lower debt issuance costs (Ayaz et al., 2021; Modigliani & Miller, 1963). Research supports this contention, which suggests that profitable firms show enhanced abilities in managing higher debt levels, resulting in decreased bankruptcy risk and costs (Neves et al., 2020). Studies in Malaysia show that leverage ratios positively correlate with firm performance, supporting the view that leverage acts as a managerial constraint against empire-building, and suggesting that the

net effect of debt financing is positive for Malaysian firms (Ayaz et al., 2021). German research shows a positive correlation between the structure of a firm's capital and its performance, potentially resulting from tax advantages and reduced cost of debt issuance relative to equity (Abdullah & Tursoy, 2021). High-technology manufacturing and service firms in Russia can experience a 16–22% increase in ROA through the effective structure of firms' capital management (Spitsin et al., 2020). Research on single-family offices in the DACH (Germany, Austria, Switzerland) region reveals a greater emphasis on the long-term structure of firms' capital optimization, leveraging debt financing to enhance returns for equity holders. Several studies have also documented a positive correlation between the structure of firms' capital and performance (Bui et al., 2023; Ngatno et al., 2021; Ronoowah & Seetanah, 2024; Tian et al., 2024). In the TOT context, incremental debt correlates positively with firm performance until a firm attains an optimal level. The hypothesis of this study is that the structure of firms' capital positively influences firms' performance. Accordingly, the hypothesis is formulated as:
H1: There is a positive association between the structure of firms' capital and their performance.

Sales Growth as Moderator Between Capital Structure and Firm Performance

This research identifies sales growth as a key moderating factor that influences the structure of firms' capital and their performance relationship. Trade-off theory's application in evaluating the moderating effect of sales growth highlights how firms' structure of capital reacts to performance metrics. Empirical evidence suggests that corporate entities dynamically adjust their capital composition to achieve a target structure of firms' capital (Su & Zheng, 2025), which may be caused by sales growth. Firms with higher debt ratios exhibit correlated sales growth (Boshnak, 2024), suggesting a capacity for superior debt management among high sales growth firms, mitigating the inherent financial risk of leverage. This is further supported by researchers who found that firms with strong sales growth also show improved profitability (Abdullah & Tursoy, 2021; Ullah, Pinglu, Ullah, Zaman, & Hashmi, 2020), leading to better debt management. Conversely, this beneficial effect becomes detrimental when indebtedness surpasses a certain threshold (Attia et al., 2023; Ayaz et al., 2021; Tian et al., 2024).

The interplay of TOT contributes to this discussion, which posits that the change of the structure of firms' capital to accommodate changing operational circumstances maintains optimal leverage ratios. Sales growth, often seen as a vital operational indicator, directly influences firm performance (Nazir et al., 2021), potentially causing a change in the structure of firms' capital decisions, such as debt (Spitsin et al., 2022). Research strongly supports this notion, revealing improvements in both sales and overall firm performance (Ahmed et al., 2023; Dao & Phan, 2023; Nazir et al., 2021). The suggestion is that with increased sales growth, firms could improve their operations efficiency, leading to higher profitability. To comprehend the moderating impact of sales growth, it is essential to analyze how significant sales increases can counterbalance the detrimental impact of substantial debt, improving firm performance despite increased leverage. Sales growth, therefore, serves as a strategic signal for firms, leading them to reconsider their capital composition to ensure sustained performance across variable market conditions.

Sales growth reflects a firm’s ability to increase revenue, signaling its market position and performance. Studies show the importance of sales growth to firm profitability and its relationship to the capital structure decisions. Firms that having strong sales growth often report better performance, typically shown through higher profitability (Dao & Phan, 2023; Nazir et al., 2021; Spitsin et al., 2022; Ullah et al., 2020). Empirical evidence also indicates a positive relationship between sales growth and leverage ratios, suggesting that firms with increase sales tend to adopt higher debt levels (Spitsin et al., 2022). Conversely, findings from Iran reveal that external financing is able to promote sales growth, reinforcing the interdependence between capital structure and revenue increment (Cheratian, Goltabar, Gholipour, & Farzanegan, 2024). These findings reflect the TOT, which explains that firms seek an optimal debt level by weighing the benefits of financing that can improve performance against the potential costs of financial distress. Further, firms with strong sales growth are better positioned to manage this trade-off because higher revenue able to reduce distress risk and strengthens their ability to meet obligations. Compared to firms with slower growth, those with strong sales can sustain greater debt because higher sales offer a cushion against financial shocks. In this way, sales growth becomes an important factor in using debt effectively, which contributes to stronger firm performance.

Building on the mentioned arguments, the second hypothesis of this study proposes that sales growth moderates the relationship between capital structure and firm performance. In accordance with the TOT, firms experiencing higher sales growth can use debt more efficiently, which enhances performance. Therefore, the hypothesis is stated as follows:
H2: The structure of firms' capital and their performance association is positively moderated by sales growth.

This study investigates how capital structure affects firm performance, with sales growth acting as a moderating factor. The analysis centers on firm performance as the dependent variable, evaluated through three indicators: return on assets, return on equity, and Tobin's Q. Capital structure serves as the independent variable and is measured using leverage to equity, leverage to assets, and market value leverage. To ensure robust findings, the study also considers control variables, including firm size, liquidity, tangibility, GDP, and inflation. Figure 1 illustrates the research framework and highlights the variables examined, along with the relationships analyzed in this study.

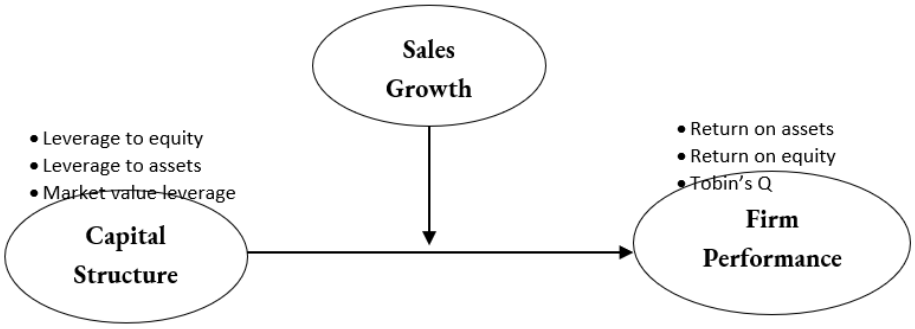

Figure 1. Research framework
Source: Author's own work

RESEARCH METHOD

Data Samples

This study uses a quantitative explanatory design and applies unbalanced panel data regression to explore how sales growth moderates the relationship between capital structure and firm performance. Panel data analyzes suitable for this purpose because it captures differences across firms and over time, controls for unobserved factors, and improves estimation efficiency. Using an unbalanced structure allows the inclusion of firms with incomplete data, which helps preserve valuable observations. The analysis focus on Southeast Asia from 2019 to 2023, a period marked by the COVID-19 pandemic in 2019 and 2020 and the recovery period after that. These events created fluctuations in sales growth and financing decisions, making this approach suitable for examining how sales growth interacts with capital structure during times of disruption and recovery.

The study uses data from publicly listed firms in six Southeast Asia countries: Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. The preparation of data involves sequential steps. First, the data comes from the Refinitiv Eikon database. Then, excluding financial and FinTech firms because of their capital structures, reporting practices, and regulatory requirements differ from other sectors. (Ayaz et al., 2021; M. N. et al., 2024; Prabowo, 2023). Further, removing observations with missing or incomplete data for related variables to maintain reliability. To reduce the effect of extreme values, all variables were winsorized at the 1st and 99th percentiles (Ayaz et al., 2021; Haque & Varghese, 2023; Sikveland et al., 2022). The final data comprises 4,229 firms, producing 18,156 observations across the six countries during the 2019–2023 period.

After preparing the data, descriptive analysis was performed, including a correlation matrix to check for multicollinearity among explanatory variables. Model estimation followed, supported by several diagnostic tests. The Breusch-Pagan LM test was used to determine whether pooled OLS is sufficient or if panel effects are present. Subsequently, the Hausman test then compared fixed and

random effects to confirm the suitability of the fixed-effects specification. The Modified Wald test addressed heteroscedasticity, and the Wooldridge test checked for autocorrelation. Based on these results, the research used a fixed-effects panel model with clustered standard errors to ensure consistent and efficient estimates. While unbalanced panels help keep more observations, it may introduce survivorship bias if missing data is not random (Baltagi, 2021), which is acknowledged as a limitation of this approach. This limitation, along with sector exclusions, means the results represent only non-financial and non-FinTech firms in Southeast Asia during the observed period.

Variable Description

The Dependents

The study operationalized firm performance, the dependent variable, through three proxy variables: Return on Assets (ROA), Return on Equity (ROE), and Tobin's Q (TobQ). The first two measures serve as common indicators of accounting performance; conversely, the latter reflects market-based firm performance. First, ROA, which represents a company's performance, shows net profit relative to total assets. The second measure is ROE, representing net profit as a proportion of total equity. These two measures are widely used to measure firm performance in the accounting and related field(Abdullah & Tursoy, 2021; Ayaz et al., 2021; M. N. et al., 2024; M N et al., 2024; Tian et al., 2024). This literature primarily focuses on two performance metrics: return on assets (ROA), reflecting asset efficiency in income generation; return on equity (ROE) demonstrates the effective use of equity to generate shareholder returns. Last, Tobin's Q (TobQ) represents the quotient obtained by dividing the aggregate of the equity's market capitalization (ordinary and preference shares) and the book value of debt by the book value of total assets. TobQ serves as an indicator of investor sentiment and may predict firm sustainability (Chang, Kyi, Yang, & Wu, 2025). The valuation considers the book and market values of a firm's assets.

The Independents and Moderator

In this research, the structure of firms' capital is the independent variable. The structure of a firm's capital structure reflects the proportional composition of debt and equity used to fund its assets and operations (Liwaul et al., 2023; Brahmayanti, 2024; Anwar et al., 2025). This study uses three proxy variables, which are leverage to equity (LE), leverage to assets (LA) and market value leverage (MVL). Multiple proxies are used to achieve a more thorough and subtle comprehension of the structure of firms' capital, resulting in more robust analytical findings. One calculates LE by dividing the sum of debt and equity (Candy & Quinn, 2023; Ullah et al., 2020). This measure assesses the structure of a firm's capital by determining the relative proportions of debt and equity used in its financing. The sum of debt divided by all assets determines LA (Abdullah & Tursoy, 2021; M. N. et al., 2024; Ullah et al., 2020; Yoewono, 2024). Leverage to assets shows how much a firm leverages its assets, showing the proportion of assets financed by debt. While the first two independent variables use backward-looking accounting measures, the third variable incorporates a forward-looking market perspective using market value leverage. The calculation for market value leverage involves dividing market value of equity by equity(Ayaz et al., 2021).

According to TOT, firms strategically weigh the tax advantages derived from debt financing against the associated risks because of excessive debt burdens. Given the influence of sales growth rate fluctuations on debt servicing ability, firms' structure of firms' capital requires corresponding adjustments to maintain performance. In this analysis, the structure of firms' capital and their performance relationship are subject to moderation by firms' sales growth. Based on the literature, the calculation of sales growth involves dividing the sales difference between the present and preceding year by the sales of the preceding year (Rauf, Wanqiu, Naveed, Qadri, & Ali, 2023; Spitsin et al., 2022)

The Controls

In analysing the sales growth, structure of firms' capital, and firms' performance relationship, this study incorporates three variables of control. Including control variables reduced selection bias and addressed firm-specific and macroeconomic factors. The first control variable, firm size, accounts for differences in firm characteristics. Total assets' natural logarithm served as the basis for calculating the firm's size

(Ayaz et al., 2021; Dodoo et al., 2023; Sdiq & Abdullah, 2022). Liquidity serves as a control variable for evaluating a firm's ability to fulfil short-term financial responsibilities using cash generated from operations. Calculating liquidity in this research involves using the operating cash flow (OCF) ratio, which is obtained by dividing the OCF with the current liability (Ertugrul & Coskun, 2021). This study prefers the OCF ratio because it effectively avoids potential distortions caused by non-liquid assets and accounting adjustments. The third control variable, tangibility, affects a firm's ability to employ its assets as collateral to secure debt. Proportion in the percentage of net tangible assets relative to total assets serves as a measure of tangibility (Ayaz et al., 2021; Sikveland et al., 2022)(Ayaz et al., 2021; Sikveland et al., 2022). For macroeconomic influence, the empirical equation includes GDP and inflation as the remaining control variables across the six Southeast Asia countries.

Econometric Model

The theory guided the construction of the regression equations to examine the proposed hypotheses empirically. The study proposes a baseline model to investigate the direct association between the structure of firms' capital and their performance, consistent with Hypothesis 1. This model incorporates control variables while excluding potential moderating factors. Below, presented the functional form of the first empirical model.

$$Perf = \propto + \beta_1 LE + \beta_2 LA + \beta_3 MVL + \sum_{I=1}^{N} Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

This study suggests a moderation model to evaluate the effect of sales growth interaction on the relationship between capital structure and firm performance. The functional form of Hypothesis 2 is:

$$Perf = \propto + \beta_1 LE + \beta_2 LA + \beta_3 MVL + \beta_4 SGr + \beta_5 LE * SGr + \beta_6 LA * SGr + \beta_7 MVL * SGr + \sum_{I=1}^{N} Controls_{i,t} + \varepsilon_{i,t} \quad (2)$$

The operationalization of firm performance (Perf) employs three proxy measures: ROA, ROE, and TobQ. The explanatory variables are the leverage to equity (LE), leverage to assets (LA), and market value leverage (MVL). Firm-specific controls include size, liquidity, and tangibility, while country-specific controls encompass GDP and inflation.

A range of specification tests, including Hausman and F-tests, informed the selection of the optimal regression method. These tests show the fixed-effects method's suitability to both ordinary least squares and random-effects methods. To address possible heteroscedasticity and autocorrelation, the researcher conducted additional analyses using the Breusch-Pagan LM and Wooldridge tests. The results revealed heteroscedasticity and autocorrelation, causing the use of cluster standard errors in this study.

RESULTS AND DISCUSSION

Results

Descriptive Statistics and Correlations

Table 1 provides a statistical summary of the descriptive data from the study variables on firm performance, capital structure, and sales growth. Firm performance is modest overall. ROA averages 0.0167, yet its standard deviation of 0.1003 shows that some firms earn far more or far less than the mean. ROE also similar but with greater volatility: a mean of 0.0351 against a deviation of 0.2533. Tobin's Q, which reflects market valuation, stands at 1.1612 on average, and the spread of 1.2471 points to large differences in how markets value firms.

Capital structure also varies. LE averages 0.6305, but the deviation of 1.0220 indicates that some firms carry much heavier debt loads. LA is steadier, with a mean of 0.2464 and a smaller deviation of 0.1968, while MVL is the most dispersed with a mean of 1.6609 and a deviation of 2.3927, highlighting sharp contrasts in market-based leverage.

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Table 1. Summary of statistics.

	Obs	Mean	St. Dev	Max	Min	50th Percentile	99th Percentile
ROA	18,156	0.016707	0.100319	0.268776	-0.461308	0.023413	0.268776
ROE	18,156	0.035118	0.253272	0.991289	-1.334203	0.051559	0.991289
Tob Q	18,156	1.161179	1.247105	8.885594	0.180023	0.790260	8.885594
LE	18,156	0.630496	1.022021	6.010630	-2.428538	0.354842	6.010630
LA	18,156	0.246355	0.196764	0.940358	0.000492	0.213312	0.940358
MVL	18,156	1.660947	2.392653	16.961640	-1.580703	0.962624	16.961640
SGr	18,156	0.100778	0.572764	3.540823	-0.872317	0.020056	3.540823
Size	18,156	18.487240	1.801029	23.348950	14.633170	18.296330	23.348950
LIQ	18,156	0.268609	0.654654	2.851372	-2.176255	0.159641	2.851372
TAN	18,156	0.312095	0.241258	0.908494	0.000538	0.269859	0.908494
GDP	18,156	3.167733	3.913295	9.690767	-6.050038	3.555487	9.690767
INF	18,156	2.453014	1.774591	6.121060	-1.138702	2.488866	6.121060

Note(s): ROA is return on assets, whilst ROE is return on equity; Tob Q denotes Tobin's Q. DER is debt-to-equity ratio, TDR is total debt ratio, and MVL is market value leverage. SGr is sales growth. Size is firm size, LIQ is liquidity, TAN is tangible, GDP is gross domestic product, and INF is inflation

Source: Data Processed – 2025

Table 2. Correlation matrix

Variables	LE	LA	MVL	SGr	Size	LIQ	TAN	GDP	INF	_cons	VIF	1/VIF
LE	1.0000										1.45	0.687932
LA	-0.2777	1.0000									1.50	0.668031
MVL	-0.4364	0.1254	1.0000								1.11	0.898919
SGr	0.0442	0.0223	-0.0802	1.0000							1.02	0.976140
Size	-0.1590	-0.0778	0.1491	-0.1068	1.0000						1.09	0.915598
LIQ	0.0125	0.1348	-0.0066	0.0006	0.0226	1.0000					1.12	0.893787
TAN	0.0037	-0.2400	-0.0043	0.0558	0.1026	-0.0351	1.0000				1.11	0.898506
GDP	-0.0142	0.0211	0.0448	-0.0866	-0.0200	-0.0007	0.0268	1.0000			1.54	0.650718
INF	-0.0026	0.0112	0.0192	-0.0212	-0.0165	0.0069	0.0397	-0.5668	1.0000		1.51	0.661046
_cons	0.1629	0.0488	-0.1635	0.1019	-0.9975	-0.0336	-0.1520	0.0167	-0.0002	1.0000		

Note(s): ROA represents return on assets, whilst ROE is return on equity; Tob Q denotes Tobin's Q. DER is debt-to-equity ratio, TDR is total debt ratio, and MVL is market value leverage. SGr is sales growth. Size is firm size, LIQ is liquidity, TAN is tangible, GDP is gross domestic product, and INF is inflation.

Source: Data Processed – 2025

SGr as the moderating variable is highly volatile. Its mean of 0.1008 contrasts with a deviation of 0.5728, suggesting frequent swings in growth rates. Control variables behave as expected: firm size is relatively stable with a mean of 18.49 and a deviation of 1.80, liquidity fluctuates more with a mean of 0.2686 and a deviation of 0.6547, and tangibility remains moderate. GDP and inflation show broader variability, reflecting economic cycles.

Table 2 presents a correlation matrix assessing multicollinearity presence of multicollinearity among variables. All correlation coefficients are below 0.80, showing no strong linear relationships among explanatory variables. VIF values confirm this, with all values below 1.55, far under the threshold of 5. These results show that multicollinearity is not a concern for the model.

Table 3 shows the result when employing fixed effects with clustered standard errors. This estimation strategy is designed to ensure both the accuracy of the coefficients and the reliability of the statistical significance. Fixed Effects (FE) account for 'omitted variable bias' by absorbing all unobserved, time-invariant characteristics of each entity, effectively allowing researchers to control for factors like corporate culture or regional traits that do not change over time. Meanwhile, Clustered Standard Errors address the issue of 'within-unit correlation,' acknowledging that observations from the same entity across different years are likely related rather than independent. By clustering at the entity level, the model produces robust standard errors that are resilient to both heteroscedasticity and serial correlation, preventing the inflation of t-statistics and ensuring that the resulting p-values are valid for hypothesis testing (Hair et al., 2018; Stock & Watson, 2019).

Table 3. The result incorporates fixed effects with clustered standard errors.

	(1) ROA	(1) ROE	(1) Tob Q	(2) ROA	(2) ROE	(2) Tobins Q
LE	-0.004383*	-0.174747*	-0.003639*	-0.003639**	-0.167008*	-0.363677*
LA	-0.183216*	0.295399*	1.697764*	-0.178542*	0.280733*	1.711520*
MVL	0.003891*	0.000478	0.333744*	0.002753*	-0.002772	0.328313*
SGr				0.009885*	0.019597*	-0.033964
LE*SGr				-0.009051*	0.074381*	-0.069411*
LA*SGr				0.046784*	-0.089554*	0.044340
MVL*SGr				0.003490*	0.007918*	0.039455*
Size	0.050466*	0.090180*	-0.382869*	0.045530*	0.075881*	-0.383417*
LIQ	0.020194*	0.037530*	0.019772**	0.020188*	0.038059*	0.020682**
TAN	-0.128071*	-0.218722*	-0.377381*	-0.116821*	-0.195547*	-0.361745*
GDP	0.001133*	0.001644*	-0.002435*	0.000804*	0.000954*	-0.002454*
INF	0.000106	0.001629	-0.001470	-0.0000344	0.000953	-0.000870
Const	- 0.844130	- 1.546479	7.620982	-0.7570317	-1.288198	7.625286
Breusch Pagan LM	0.000	0.000	0.000	0.000	0.000	0.000
Mod Wald Test	0.000	0.000	0.000	0.000	0.000	0.000
Wooldridge	0.000	0.000	0.000	0.000	0.000	0.000
Hausman Test	0.000	0.000	0.000	0.000	0.000	0.000
N (Obs)	18,156	18,156	18,156	18,156	18,156	18,156
No. of IDs (Firms)	4,229	4,229	4,229	4,229	4,229	4,229
R-Square	0.136800	0.273100	0.546900	0.169800	0.312100	0.550300
F-Test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Note(s): ROA represents return on assets, whilst ROE is return on equity; Tob Q is Tobin's Q. LE denotes leverage to equity, LA is leverage to assets, and MVL is market value leverage. SGr is sales growth. Size denotes firm size, LIQ is liquidity, TAN is tangible, GDP is gross domestic product, and INF is inflation. *, **, ***shows significant at 1%, 5% and 10%.

Source: Data Processed – 2025

Discussion

Overview

This study examines how the structure of a firm's capital connects to its performance and whether sales growth changes that connection. In examining this, this research applied a fixed-effect panel regression model with clustered standard errors. The results presented in Table 3 relate to two hypotheses. Our analysis focuses on coefficient estimates and significance to understand the relationship between firm performance and capital structure. First, we look at the direct effect of capital structure and firm performance. After that, incorporating sales growth as a moderator to understand whether it plays a role in altering, strengthening, or weakening these effects. The analysis period includes 2019–2020, when the COVID-19 pandemic disrupted Southeast Asia firms by weakening sales growth and performance, as well as influencing capital structure decisions. These disruptions affected both the direct relationships and the moderating effect considered in this study.

The Direct Relationships

The first hypothesis proposes a positive association between the capital structure and firm performance. The analysis of the first hypothesis divides the discussion into three measures of capital structure. These measures are leverage to equity (LE), leverage to assets (LA), and market value leverage (MVL). Each measure is examined to assess its relationship with firm performance. The evaluation uses three indicators, which include return on assets (ROA), return on equity (ROE), and Tobin's Q. This structure ensures that the study captures how different leverage measures correspond to these performance metrics.

Analysis of Model 1 in Table 3 explains the direct relationship between each capital structure measure and the corresponding performance metric. The first analysis applies leverage to equity (LE) as the initial measure of capital structure and finds a significant negative relationship between LE and all performance indicators, which include ROA, ROE, and TobQ, for non-financial firms. This finding contradicts Hypothesis 1 and aligns with prior research indicating that high leverage can harm performance (Ayaz et al., 2021; Dodoo et al., 2023; Ronoowah & Seetanah, 2024; Ullah et al., 2020). Financially distressed firms appear more vulnerable to this effect (Kalash, 2023). These results suggest that excessive debt raises financial distress costs, supporting an extension of the trade-off theory (TOT) to include firms' tendency to default, where profitable firms maintain lower debt ratios (Lindset, Nygård, & Persson, 2024; Qin, 2024).

Further analysis using second alternative capital structure indicators provides a more nuanced perspective. The leverage to assets (LA) shows a significant positive relationship with ROE and TobQ, although it remains strongly negative with ROA. Based on two performance metrics, this evidence partially supports Hypothesis 1, showing that LA can improve performance when managed effectively. This finding is consistent with prior research emphasizing the benefits of prudent debt use for business operation, which in turn positively affects performance (Bui et al., 2023). While the negative relationship with ROA persists, the results imply that leverage may reduce operational efficiency but still increase shareholder returns and valuation under certain conditions.

The third measure, market value leverage (MVL), demonstrates a significant positive correlation with ROA and TobQ, though its association with ROE is insignificant. These results further support Hypothesis 1 and align with studies showing positive perceptions of market-based leverage when debt is strategically used to improve performance (Kang and Baek, 2024). Market valuation appears to reward firms that manage leverage effectively, signaling confidence in their ability to use debt for performance-generating activities. This reinforces the argument that an optimal capital structure can improve performance when applied correctly (Ma, Yuan, & Xu, 2025).

In summary, the findings suggest partial support for Hypothesis 1. LA shows positive associations with ROE and TobQ, while MVL is linked positively to ROA and TobQ. However, the negative relationship between LA and ROA and the adverse effect of high LE across all performance metrics cannot be ignored. These results underscore the importance of balancing debt benefits against financial distress costs, which is consistent with the TOT. Optimal leverage emerges as a measurable condition rather than a theoretical ideal, requiring firms to weigh tax advantages against risk exposure

to achieve improved performance. This evidence further supports the TOT while extending and refining it in emerging Southeast Asia markets. The findings suggest that optimal leverage is not a fixed benchmark but varies with market conditions and firm-specific characteristics (i.e. financial vs. non-financial). Market valuation signals appear more reliable than accounting measures in reflecting the benefits of leverage. The study posits that TOT as a flexible framework that should account for regional and firm-specific characteristics rather than assuming that higher leverage consistently improves performance.

The Moderating Effect of Sales Growth

This study's second hypothesis is that sales growth will have a positive moderating effect on the relationship between capital structure and firm performance. Like the first hypothesis, this analysis is divided into three parts. Each part examines how sales growth moderates the relationship between a specific capital structure measure and distinct performance metrics. This design helps the study capture the influence of sales growth on different leverage measures and their relationship to performance indicators. Model 2 in Table 3 reports the regression analysis for the moderating effects using interaction terms of LE*SGr, LA*SGr, and MVL*SGr for each relationship between capital structure and firm performance.

The first discussion under the hypothesis 2 focuses on moderation effect on the relationship between LE and performance metrics. The results show that sales growth affects this relationship differently across the measures. The analysis shows a significant negative correlation between LE and both ROA and TobQ, which contradicts Hypothesis 2. However, the positive and significant correlation with ROE provides partial support for the hypothesis 2. The analysis of sales growth moderation shows another insight which present a shift from negative to positive in the relationship between LE and ROE, which still maintains significance. The results suggest that firms increasing leverage during strong sales periods may gain advantages but also face risks associated with debt. High leverage may negatively affect cash flows, particularly if sales growth does not translate into sustained profitability, diminishing operational efficiency and market capitalization. Hence, a rise in leverage may lead to higher costs associated with financial distress (Ayash & Rastad, 2021), ultimately affecting performance negatively (Islam & Iqbal, 2022; Kalash, 2023; Ullah et al., 2020). Alternatively, the positive relationship shows that firms can use debt strategically to increase equity returns when sales growth creates favorable conditions. Prior research supports this, highlighting the ability of firms to optimize their capital structure to leverage growth opportunities while mitigating associated risks (Spitsin et al., 2022; Ullah et al., 2020).

The second interaction of SGr between LA and firm performance measures adds another insight. When SGr moderates the relationship, the results reveal a significant shift from negative to positive correlation between LA and ROA, while the relationship between LA and ROE turns negative. The association between LA and Tobin's Q changes from significant to insignificant after moderation. These alterations show that the direction and strength of the relationships vary when sales growth is introduced as a moderator. The findings partially align with Hypothesis 2, implying that sales growth strengthens the relationship between capital structure and performance represented by ROA but weakens its association with ROE, while market value leverage loses its prior significance. The results suggest firms can leverage their assets effectively to improve operational performance during periods of growth. Expanding with debt under favorable sales conditions can help firms fund operations without severe financial strain, as supported by prior research (Islam & Iqbal, 2022; Ullah et al., 2020). However, the negative shift in ROE highlights a potential drawback. High leverage during a sales growth period can reduce returns to shareholders if risk management practices are inadequate. This underlines the importance of cautious debt strategies, because excessive debt can negatively affect a firm's performance (Nazir et al., 2021).

The last part of the moderation analysis examines MVL as a measure of capital structure, and this measure provides the strongest support for Hypothesis 2. In this discussion, sales growth moderates the relationship between capital structure and firm performance. The analysis shows that SGr alters the relationship between MVL and ROE. It moves from negative and non-significant to positive and significant. This shift suggests that firms may gain from market-based leverage during expansion when strong sales growth persists. These findings indicate that firms can improve overall performance by

combining market capitalization with debt in periods of growth. Higher SGr also allows firms to take advantage of stronger market valuations to secure additional financing. Growth in sales also implies that firms can leverage higher market valuations to secure further financing, leading to greater operational efficiency and increased performance. Prior research supports this view, showing that firms capable of aligning leverage with growth opportunities tend to achieve better financial performance (Kalash, 2023; Spitsin et al., 2020).

In conclusion, the findings suggest partial support for Hypothesis 2. Sales growth moderates the relationship between capital structure and performance, but the effect varies across capital structure measures and performance indicators. Positive moderation is present for MVL across all performance metrics, LE with ROE and for LA with ROA and the negative moderation also present for LE with both ROA and TobQ as well as LA with ROE. These findings emphasize the importance of managing debt carefully during growth periods. Consistent with TOT, the results suggest that debt can enhance performance during strong sales growth periods, but the risk of financial distress remains intact and can offset the potential benefits.

These findings contribute to deepening the understanding of TOT by revealing how sales growth changes the impact of capital structure on firm performance. When sales growth is strong and market valuations increase, firms can use MVL to improve performance. To achieve this effectively, firms' managers should consider a capital structure that reflects market value, such as issuing corporate bonds and other financing options related to market capitalization. These strategies help firms access funds without overloading asset-backed debt, which aligns with the principle of TOT: capture benefits while controlling distress costs. The negative moderation for LE with ROA and Tobin's Q, and for LA with ROE, showed a potential risk. Excessive debt, even during sales growth, can reduce performance and shareholder returns. Managers should therefore avoid uniform leverage policies and instead consider borrowing decisions to sales growth quality and profitability. Regulators can reinforce this by requiring transparent disclosure of leverage metrics and strengthening governance standards. These measures would help prevent firm-level financial risk and maintain stability in Southeast Asia's corporate sector. This study covers the period from 2019 to 2023, focuses on Southeast Asia, and uses a sample of non-financial listed firms. These limits the findings may not apply to other regions or sectors. Future research should examine different industries, longer time frames, and alternative financing structures to understand how leverage strategies perform under varied growth conditions.

CONCLUSION

This research strengthens the understanding of capital structure in Southeast Asia by testing two hypotheses. The first examines how capital structure directly affects firm performance, and the second considers whether sales growth moderates that relationship. Using data from listed firms between 2019 and 2023, the findings provide partial support for both. Capital structure influences performance in different ways, and sales growth changes these links in ways that are not always predictable. At times, growth amplifies the benefits of leverage, while in other cases it increases financial risk. Firms with strong growth appear better able to absorb the risks associated with higher debt, shifting the point where leverage becomes harmful. When growth slows, leverage can quickly lead to distress. The research period includes the COVID-19 pandemic, which disrupted economic activity and created unusual patterns in sales growth, financing decisions, and performance. These conditions limit how far the results can be generalized to normal economic environments.

This research expands the understanding of capital structure in Southeast Asia by exploring two hypotheses. Hypothetically, it examines the direct effect of capital structure on firm performance and the moderating effect of sales growth in that relationship. The study focuses on listed firms in the region during the period from 2019 to 2023. The findings provide partial support for both hypotheses. Capital structure influences performance in mixed ways, and sales growth changes the strength and direction of these effects that are not always predictable. In some cases, growth strengthens the benefits of leverage, while in others it increases financial risks. The research period includes the COVID-19 pandemic in 2019 and 2020. This global crisis disrupted economic activity, shifted consumer demand,

and tightened financing options. Lockdowns and supply chain interruptions reduced revenues across industries, creating unusual patterns in sales growth, leverage decisions, and performance. These exceptional circumstances may have affected the results, making the research less representative of normal economic conditions and limiting its generalizability.

Building upon Modigliani and Miller's (1958, 1963) seminal work, the results provide a refined understanding of the TOT by highlighting the balance between the benefits of capital structure and the risks of financial distress. This study expands upon the trade-off theory by incorporating sales growth as a moderating variable, showing that the optimal capital structure is not fixed. It shifts with a firm's growth projection. LE and LA show inconsistent effects even when moderated by sales growth, but MVL consistently demonstrates a positive association with ROA, ROE, and Tobin's Q when sales growth is strong. This indicates that firms with high sales growth and strong market value can improve performance by adopting capital structures that reflect market capitalization, such as issuing corporate bonds, right issues or other market-based instruments. Sales growth therefore plays an important role in determining the trade-off threshold, allowing firms with expansion prospects to use debt more effectively without exposing themselves to excessive financial distress.

From a practical perspective, managers should adopt flexible capital structure strategies that respond to growth and market valuation. When sales growth is strong and market value is high, manager can increase performance through market-based financing options to finance the operation. Even in times strong sales growth, managers should maintain liquidity and conduct borrowing check to prevent excessive borrowing. From a regulatory perspective, stronger governance frameworks are needed to discourage excessive borrowing during periods of rapid growth. Regulators should focus on three practical steps. First, require firms to clearly report debt levels and growth indicators. Second, encourage disclosure of borrowing-test results to assess resilience under adverse conditions. Third, provide guidance on responsible borrowing practices when debt decisions rely on market value. These measures would improve transparency, reduce financial risk, and promote stability in emerging markets.

In summary, this research offers a more nuanced understanding of the TOT by showing that capital structure decisions require a careful assessment between the benefits of debt and the risks of financial distress, particularly when moderated by sales growth. Firms with strong growth are more resilient to financial risk, which shifts the trade-off threshold and strengthens the positive effects of leverage. However, the study faces several limitations, including a restricted sample of listed firms, a limited research period (2019–2023) that overlaps with the COVID-19 pandemic, and the exclusion of non-financial and fintech sectors. These factors may affect representativeness and measurement accuracy. Future research should address these limitations by using larger and more diverse samples, extending the time horizon beyond crisis periods, incorporating multiple sectors, and applying robust econometric methodologies. In addition, future studies should examine other moderating variables such as firm age, ownership structure, corporate governance quality, and market volatility to provide deeper insights into how contextual factors influence the relationship between capital structure and firm performance.

List of Abbreviations

TOT = Trade-off Theory
ROA = Return on Assets
ROE = Return on Equity
LE = Leverage to Equity
LA = Leverage to Assets
MVL = Market Value Leverage
SGr = Sales Growth
LIQ = Liquidity
TAN = Tangible,
GDP = Gross Domestic Product
INF = Inflation

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