https://doi.org/10.59865/abacj.2025.45

A COMPARATIVE STUDY OF CAPITAL STRUCTURE AND FIRM VALUE: PRE- AND POST-COVID-19 PANDEMIC AMONG LISTED COMPANIES ON THE STOCK EXCHANGE OF THAILAND

Suchart Prakthayanon[1] and Pornpawee Worasatepongsa[2,*]

Abstract

This study considers the relationship between capital structure and firm value among Thai listed firms, comparing this relationship across three time phases—pre-COVID-19 (2018–2019), during COVID-19 (2020–2021), and post-COVID-19 (2022–2023). Using firm-level accounting and market data from the Stock Exchange of Thailand (SET) (n=423), the study estimates period-specific regressions that link leverage to standard determinants and assess the leverage value association (Tobin's Q). The results reveal a crisis-phase decoupling: the positive association between leverage and firm value observed before the pandemic disappears during the pandemic and re-emerges afterward. Determinants of leverage also shift across phases: higher operating cash flow is consistently associated with lower leverage, tax-related incentives are effective mainly in normal times, and the roles of asset tangibility and liquidity invert in the Thai context when market conditions tighten. These findings highlight the context-specific nature of financing decisions in emerging markets and clarify why leverage can alternately amplify or dampen firm value across macroeconomic regimes. The study contributes comparative evidence for a three-phase COVID framework and underscores practical levers, particularly liquidity backstops and calibrated tax instruments that can help firms sustain investment and employment during downturns while discouraging excessive debt during recovery. SET firms have overcome COVID-19, serving as a positive signal for both domestic investors and foreign investors.

Keywords: Post COVID-19, Capital Structure, Firm Value, SDG8, Tobin's Q, SET

INTRODUCTION

The global COVID-19 pandemic broadly affected the economy and financial markets worldwide, including the Stock Exchange of Thailand (SET). The SET plays a crucial role in Southeast Asia's financial landscape. The unprecedented challenges of the pandemic caused market volatility and supply chain disruptions as well as leading to changes in consumer behavior. Evaluating the capital structure and value of companies listed on the SET provides important insights into the impact of this crisis (Bai et al., 2023).

From past to present, business operations have required financial managers to be responsible for three decisions, namely investment budgeting, capital structure, and working

[1] Asst. Prof. Dr. Suchart Prakthayanon is currently a lecturer and the Program Director of the Doctor of Business Administration (DBA) program in the Department of Business Administration at Bangkok Thonburi University, Thailand. He obtained his Doctor of Business Administration (DBA) from Bangkok Thonburi University, Thailand. Email: suchart.prak@bkkthon.ac.th

2,* Asst. Prof. Dr. Pornpawee Worasatepongsa (Corresponding Author) is currently the Head of the Business Administration Division at the School of Interdisciplinary Studies, Mahidol University, Kanchanaburi Campus, Thailand. She obtained her Doctor of Business Administration (DBA) from Pathum Thani University, Thailand. Email: pornpawee.wor@mahidol.ac.th

capital management. Companies must secure funding from an appropriate capital structure with the lowest financial cost to expand their business, develop potential and increase future growth opportunities. Capital structure consists of liabilities and equity. Funding can be obtained through one of three approaches (Kimmel & Warfield, 1995): 1) Debt financing: This method allows companies to deduct interest expenses as costs, reducing taxes and lowering the cost of capital. This approach maintains the existing shareholders' ownership proportions. However, it has drawbacks. If the company faces financial difficulties and cannot repay principals and interest on time, it increases operational risk and reduces management flexibility, risking bankruptcy. 2) Additional investment: This involves raising funds from owners. It represents long-term investment with no obligation to pay returns to owners and no burden to repay invested capital. However, if managers are not the investment owners and bear no responsibility for business risks, they may lack motivation to operate for maximum benefit and might inappropriately transfer company assets for personal gain or avoid investing in various projects to prevent potential mistakes. 3) Issuing preferred stock: This is when holders have no voting rights in business decisions but receive agreed-upon investment returns. This leads to determining the optimal capital structure to maximize firm value and achieve the lowest total cost of capital.

This has led to capital structure research since 1958 by Professor Modigliani and Miller in M&M Theory on the 'Irrelevance Theory of Capital Structure' (Modigliani and Miller, 1958). Modigliani and Miller (1958) proposed that financing does not affect firm value in a perfect capital market, based on 6 assumptions, namely no brokerage fees in securities trading, no taxes, no bankruptcy costs, investors' ability to borrow at the same interest rate as companies, investors' possession of information about future investments, and debt use not affecting earnings before interest and taxes (EBIT). The theory divides companies into two groups. First, companies with no external borrowing (Unlevered Firms). Second, companies with some level of external borrowing (Levered Firms). They found that, disregarding taxes, the value of both types of companies would be equal in all cases. Later in 1963, the assumption was relaxed to consider corporate income tax. External borrowing provides tax benefits to companies. Thus, as external borrowing increases, the Weighted Average Cost of Capital (WACC) decreases. They found that companies with 100% external borrowing have the best capital structure. This finding contradicted reality, leading to the Trade-off Theory proposed by Kraus and Litzenberger (1973) and Myers (1977). Company fundraising comes from both internal and external sources. The advantage of external funding or borrowing is that interest from borrowing helps save taxes. Conversely, it can cause financial distress for the company, increasing another cost, specifically bankruptcy cost, resulting in decreased company value. However, in managing and creating maximum wealth for shareholders, agents must be appointed according to Jensen and Meckling's (1976) study, which presented the Agency Cost Theory. Sometimes, executives or agents may be motivated to conduct business in ways that benefit themselves and their associates more than maximizing shareholder wealth as it should be. This results in agency costs, leading to Myers and Majluf's (1984) study of the Pecking Order Theory, which found asymmetric information problems between shareholders and company executives. Companies will raise funds to solve this problem, starting with internal funding first and when insufficient, they seek external funding by issuing debt securities. Companies must consider the lowest-risk securities first. External borrowing signals that the investment will create wealth for shareholders and that the current stock price is undervalued. Meanwhile, an increase in share capital signals that the current stock price is overvalued. Therefore, it can be said that the directional influence of company characteristics on financial structure determination has both similarities and differences. For example, Agency Theory suggests that performance and liquidity positively affect debt, while Pecking Order Theory states that performance and liquidity negatively affect debt. Beyond the theoretical propositions

with both consistent and conflicting aspects, empirical research findings in foreign countries, including Europe, Asia and the United States, vary considerably. However, they share a common objective of finding the best capital structure to increase company value (Dao & Ta, 2020; Singhal et al., 2022).

The concept of measuring company value has gained significant popularity, presenting accounting figures from financial statements combined with qualitative market data, known as the Tobin's Q concept. Professor James T. Tobin of Yale University invented this concept, earning him the Nobel Prize in Economics in 1981. This concept remains widely used today to measure company value. In 1994, researchers simplified the Tobin's Q calculation formula, making it easier and more economical, following the approach of Lindenberg and Ross (1981). The results closely resemble the original method, with no less than 96% similarity. Previous studies on the relationship between capital structure and company value have primarily occurred in foreign countries. For instance, Cuevas-Vargas et al. (2022) examined the direct and indirect effects of capital structure and innovation on the performance of SMEs in Mexico. They discovered that capital structure directly affects innovation and indirectly affects company performance. If SMEs want to improve their performance, they must increase their level of innovation. To increase innovation levels, a company requires an appropriate capital structure for operations. Similarly, research by Do et al. (2022) found that investors have started using the relationship between financial leverage and firm value. They observed that when investors buy stocks with financial leverage, they receive increased returns. Conversely, returns decrease when investing in stocks without financial leverage. Additionally, Dempsey's (2019) study on financial leverage, company value and economic cycles explained that increased debt leads to higher stock prices. This is because increased debt reduces the company's P/E ratio. However, if a company increases debt excessively, it creates a risk of inability to repay debts. This also results in higher borrowing costs for the company, potentially leading to bankruptcy. In contrast, a recent study by Keefe and Nguyen (2023) discovered that increased volatility in operating cash flow positively correlates with debt repayment at maturity, with statistical significance. They studied a sample of 206,445 companies in 42 countries from 1990 to 2015, finding that as operating cash flow volatility increases, long-term debt decreases. The conflicting results from these studies likely stem from differences in economic environments, company sizes, business growth rates and investor proportions and types. To assess a company's capital structure level, we must rely on financial ratio analysis. This analysis can measure a company's debt management and drive value creation. If a company uses funds from debt, capital increase, or asset sales to continue operations, the company's value will decrease in the long term.

The COVID-19 situation greatly impacted the global economy. In 2020-2021, the SET companies experienced both direct and indirect negative effects on their operations. Although the situation became controllable in 2022, with significantly increased investment from foreign investors and institutional groups, many investors still lack confidence in SET companies' ability to operate normally, considering both capital structure and company value. This leads to the study of capital structure and company value under the Trade-off Theory, Agency Theory and Pecking Order Theory. This research aims to understand the factors affecting capital structure determination and the relationship between capital structure and firm value during the COVID-19 outbreak compared to pre- and post-pandemic situations. Knowing which variables determine the appropriate capital structure and added value of companies listed on the Stock Exchange of Thailand in different situations will benefit managers and stakeholders in reducing future investment decision errors.

RESEARCH OBJECTIVES

This study, 'A Comparative Study of Capital Structure and Firm Value: Pre- and Post-COVID-19 pandemic among Listed Companies on the Stock Exchange of Thailand' aims to compare the impact of appropriate capital structure on firm value before, during and after the COVID-19 outbreak. The study population consists of companies listed on the Stock Exchange of Thailand from 2017 to 2023. Trade-off Theory, Agency Cost Theory and Pecking Order Theory are used to analyze the pre-, during and post-COVID-19 periods.

LITERATURE REVIEW

Related literature, covering three main issues, namely 1) Capital structure and related variables, 2) The relationship between capital structure and company value and 3) Research conceptual framework, was reviewed as summarized below.

Capital Structure

Capital structure indicates how a company finances its operations, either through debt or equity. When discussing its relationship with firm value, it is important to clearly explain how debt specifically impacts firm value.

Theories Related to Capital Structure

1. Modigliani and Miller (M&M) Theory

The MM1 concept, an old and widely discussed theory by Modigliani & Miller (1958), proposed that capital structure does not relate to firm value under perfect capital market conditions and assumptions. The M&M Theory (Modigliani & Miller, 1958) argues that in a perfect capital market, capital structure does not affect a company's value, without considering tax implications. Consequently, Modigliani and Miller (1963) relaxed the assumptions that conflicted with reality, resulting in the MM2 concept. They stated that interest paid to creditors counts as an expense and can be tax-deductible (Tax Shield Effect), while dividends paid to shareholders cannot be tax-deductible. This led companies to increase their debt proportion due to tax benefits. Tax benefits help reduce a company's Weighted Average Cost of Capital (WACC) and increase firm value. However, excessive debt increases the risk of failing to repay the principal and interest. Meanwhile, creditors demand higher returns, increasing financial risk costs and bankruptcy costs, ultimately reducing firm value.

2. Trade-off Theory

Developed from Modigliani and Miller's concepts (Modigliani and Miller, 1958-1963), this theory states that each company has an optimal debt ratio in its capital structure. This optimal point balances the benefits of debt and the costs of bankruptcy risk. The best capital structure can increase firm value through tax savings. Kraus and Litzenberger (1973) and Myers (1977) proposed the optimal capital structure to compare the value between tax benefits (Tax Shield Effect) and bankruptcy costs. They found the appropriate point of capital structure from market imperfections between debt benefits, and bankruptcy risk costs from debt and agency costs (Vuong et al., 2023).

Fischer and Jensen (2019) argued that at general equilibrium, not only does the debt tax shield affect capital structure and firm value, it also allows companies to deduct interest expenses, reducing net profits and thus lowering taxes. Jaisinghani and Kanjilal (2017) discovered a non-linear dynamic relationship between capital structure and profitability in Indian companies, varying by company size. Large companies benefit more from debt than

equity in their capital structure. Meanwhile, small companies have a better chance of survival with debt levels lower than equity in their capital structure.

3. Agency Theory

In agency theory, problems stem from asymmetric information and risk aversion. We can explain this through the principal-agent relationship. Agents operate according to their own goals, which differ from company objectives. The company's principals, the shareholders, aim for maximizing their wealth. Meanwhile, agents or managers might aim for high sales to demonstrate their management ability. This causes principal-agent problems. High sales do not necessarily mean high profits due to potentially high expenses. The information asymmetry between principals and agents arises because managers, as company agents, have more operational information than shareholders, the principals. Shareholders cannot efficiently monitor managers' operations (Jensen & Meckling, 1976). Therefore, agency costs occur as creditors increase interest rates to compensate for potential risks.

Jensen (1986) suggested reducing such conflicts by increasing the debt proportion in the capital structure. Companies must secure funds to pay interest and principals on schedule. Additionally, paying bonuses increases motivation to achieve shareholder-set goals, thus reducing the amount of money that tempts managers to seek personal benefits.

4. Pecking Order Theory

Pecking Order Theory is a widely recognized concept in corporate finance, developed by Stewart C. Myers and Majluf (1984). This theory explains how companies prioritize their sources of financing, starting with internal funds, then moving to debt and finally, raising capital through the issuance of equity. The main objective is to minimize the impact of asymmetric information between management and external investors.

In detail, companies typically prefer to use internal financing (such as retained earnings) first, as it avoids the costs associated with disclosing information when using external sources. If internal funds are insufficient, companies then opt for debt, as issuing debt involves lower information costs compared to equity issuance. This is because debt has more clearly defined financial obligations than equity. Finally, if no other options are available, companies will issue equity, which carries the highest cost. This is because investors often interpret new equity issuance as a sign that the company may have valuation or risk issues.

This concept also reflects the relationship between management, who possess in-depth information about the business, and investors, who have less information. Reducing the asymmetry of information is a key factor driving companies to follow this hierarchy when raising capital.

The literature review on capital structure reveals the following related variables:

1. Firm Size

Several studies have found a positive relationship between firm size and capital structure. Li and Qiu (2021) stated that large companies with substantial investments and low bankruptcy risk can create greater debt at lower costs than small companies. However, large companies often face information asymmetry between shareholders and external funding sources. This causes large companies issuing equity to experience effects similar to small companies, meaning firm size can negatively relate to capital structure. In a Money and Finance Planning article by the Stock Exchange of Thailand's Investor Knowledge Development Department, Phokachai (2023) discussed the simplest method to measure stock size using market capitalization. Stocks with market capitalization over 30,000 million baht are considered large (L), between 5,000-30,000 million baht are medium (M) and below 5,000 million baht are small (S). Therefore, the following hypotheses were established accordingly:

H_{01}: There is no effect of size (SZ) on capital structure.

H_{A1}: There is a negative effect of size (SZ) on capital structure.

2. Tangible Assets and Asset Structure

Tangible assets serve as collateral for debt. Boasiako et al. (2022) suggested that companies with substantial tangible assets significantly impact cash levels and corporate financing. This reduces funding costs. Thus, asset structure positively relates to a company's capital structure. The following hypotheses are proposed accordingly:

H_{02}: There is no effect of Asset Structure (AS) on capital structure.

H_{A2}: There is a positive effect of Asset Structure (AS) on capital structure.

3. Liquidity

Liquidity represents the ratio of current assets to current liabilities. If a company has high liquidity and requires additional funds, it will first use internal sources such as retained earnings. If insufficient, it will then choose debt financing and finally equity issuance. Therefore, high liquidity companies tend to have lower debt ratios. Dinc and Bilgin (2020) found that as debt burden increases, liquidity decreases, positively affecting the company's capital structure. The following hypotheses are proposed accordingly:

H_{03}: There is no effect of Liquidity (LQ) on capital structure.

H_{A3}: There is a negative effect of Liquidity (LQ) on capital structure.

4. Growth

When a company experiences high growth, it likely has high profitability. The company will first use internal funding sources. If internal sources are insufficient, it will issue new shares rather than incur debt. Zhao et al. (2022) stated that during periods of high company value, firms prefer equity financing over debt. Thus, as company value increases, it negatively affects capital structure proportions. Consequently, the following hypotheses are proposed:

H_{04}: There is no effect of Growth (GW) on capital structure.

H_{A4}: There is a negative effect of Growth (GW) on capital structure.

5. Earnings and Profitability

When a business has high profitability, it likely has substantial retained earnings and doesn't necessitate much debt. Conversely, low profitability means lower retained earnings, leading to greater debt. Siqueira, Guenster et al. (2018) stated that profit-seeking companies with good profits tend to have lower debt. Earnings reflect the net profit that a company receives from its operations. The following hypotheses are proposed accordingly:

H_{05}: There is no effect of Earnings (EN) on capital structure.

H_{A5}: There is a negative effect of Earnings (EN) on capital structure.

6. Tax Shield Effects

Ross et al. (1995) explained that a good capital structure must consider maximum benefits of debt and bankruptcy risk. When companies are financed through debt, they can use financial costs as tax-deductible expenses. This tends to increase the company's debt ratio. Companies can save taxes from debt through interest expenses, depreciation and amortization. This leads to companies choosing debt financing over equity issuance. It can be concluded that as debt costs increase, the capital structure proportion increases. This leads to the next hypotheses:

H_{06}: There is no effect of Tax shields (TX) on capital structure.

H_{A6}: There is a positive effect of Tax shields (TX) on capital structure.

7. Operating Cash Flow

Caban-Garcia et al. (2020) emphasized the importance of cash flow, where operating cashflow (OCF) is the variance between operating cash inflow and operating cash outflow. Improving cash flow positively affects financial performance as measured by ROA. Han et al. (2024) stated that if operating cash flow levels decrease due to excessive investment by top management, it negatively impacts liquidity and capital levels more than investment benefits. It can be said that operating cash flow negatively affects the company's capital structure. Based on this, the following hypotheses were formulated:

H_{07}: There is no effect of Operating CF (OCF) on capital structure.

H_{A7}: There is a negative effect of Operating CF (OCF) on capital structure.

8. Tobin's Q

Le et al. (2024) explained that this ratio measures performance. It reflects information from financial statements, namely historical data and the market value of common stock, and is used to measure company value and future growth opportunities.

Relationship between Capital Structure and Firm Value

This research uses Tobin's Q to measure firm value, based on the concept by Professor James T. Tobin of Yale University (1981). The Q ratio is calculated as the market value of a company divided by the book value of the firm's assets. Since total asset replacement cost is difficult to estimate, analysts often use another formula to estimate Tobin's Q ratio (Perfect and Wiles, 1994) as follows:

$$\text{Tobin's Q} = \frac{\text{Market Value of Equity + Book Value of Debt}}{\text{Book Value of Total Assets}}$$

Where:

The market value of a Firm = Market Value of Equity + Book Value of Debt

Replacement Cost of Assets = Book Value of Total Assets

Previous research on the relationship between capital structure and firm value has found that changes in capital structure affect firm value both positively and negatively, sometimes having no impact on firm value. For example, Vargas et al. (2022) discovered that capital structure has an indirect positive affects on firm value with statistical significance. The optimal capital structure must blend debt and equity proportions. Changes in capital structure affect firm value. Therefore, in company financial policies, managers often use higher debt proportions than equity in the optimal capital structure to increase shareholder wealth. Liu et al. (2020) found that companies with capital structures consisting of more short-term debt than long-term debt, can increase firm value to a greater extent than other capital structures. This leads to higher growth opportunities. It can be said that companies financing through debt send a positive signal to investors about good performance and high future growth opportunities. Thus, they can borrow money to invest in company assets. However, this contradicts the research of Jadiyappa et al. (2020) which found that financing from external borrowing negatively impacts firm value. The increased interest cost becomes a financial constraint that adversely affects firm value. It can be concluded that high capital structure negatively impacts firm value, leading to the next hypotheses:

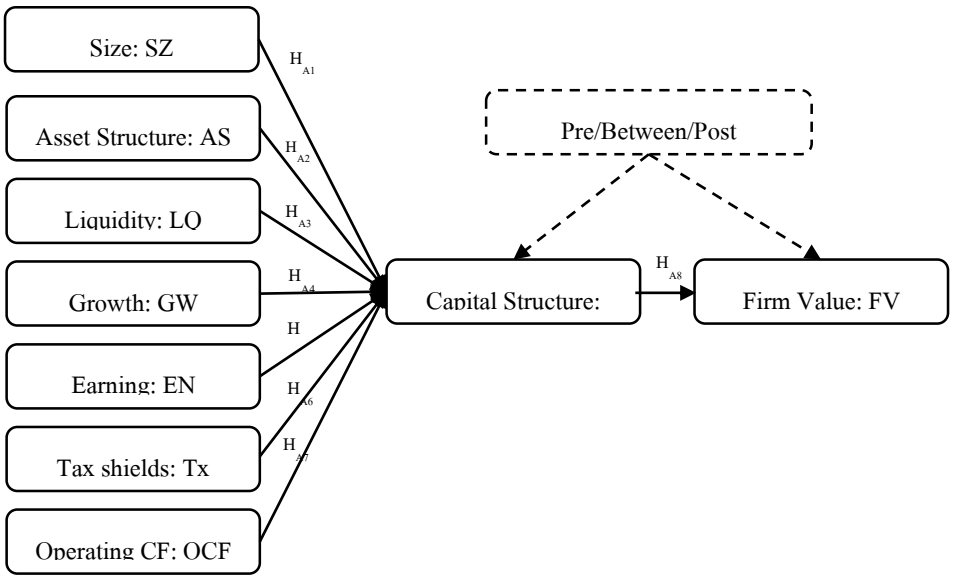
H_{08}: There is no effect of Capital Structure (CS) on Firm Value (FV).

H_{A8}: There is an effect of Capital Structure (CS) on Firm Value (FV).

Based on the literature review, the conceptual framework of this study suits analysis using Multiple Regression Analysis (MRA), discussed in detail below.

RESEARCH FRAMEWORK

Figure 1: Conceptual framework



RESEARCH METHODOLOGY

This research adopted an empirical study approach, categorizing firms by industry group. Company-specific characteristics data from 2018 to 2023 were collected, excluding companies listed on the MAI and those undergoing business rehabilitation, as these groups have financial and business structures different from other industry groups. Secondary data were gathered from the Stock Exchange of Thailand (SET, 2023) including accounting information in financial statements and annual registration statements (Form 56-1) for 2018-2023 (SETSMART, 2023).

The study population consisted of 681 companies listed on the Stock Exchange of Thailand, categorized into 8 industry groups: Agriculture and Food Industry, Consumer Products, Real Estate and Construction, Industrial Products, Resources, Services, Technology and Financials. However, while most businesses generate profits primarily from the sale of goods or services, the financial sector derives its earnings mainly from interest rate spreads and fees. Therefore, the financial business group was excluded from the study, as shown in Table 1.

Table 1: Number and percentage of companies listed on the Stock Exchange of Thailand by industry group

Industry Group	Total Number	Number Used	Percentage of Population
Agriculture and Food Industry (AGRO)	69	60	14.18
Consumer Products (CONSUMP)	43	34	8.04
Real Estate and Construction (PROPCON)	168	75	17.73
Industrial Products (INDUS)	94	71	16.78
Resources (RESOURC)	68	54	12.77
Services (SERVICE)	127	94	22.22
Technology (TECH)	42	35	8.27
Total	611	423	100.00

Source: SETSMART (retrieved on May 26, 2024)

Table 1 shows that out of 611 companies listed on the Stock Exchange of Thailand, only 423 companies (69.23% of all listed companies) had sufficient complete data for this study. These companies were classified into 8 industry groups, with the Service group having the greatest number of companies at 94 (22.22%), followed by Real Estate and Construction with 75 companies (17.73%), Industrial Products with 71 companies (16.78%), Agriculture and Food Industry with 60 companies (14.18%), Resources with 54 companies (12.77%), Technology with 35 companies (8.27%) and Consumer Products with the least at 34 companies (8.04%). Data were analyzed for the pre-COVID-19 period (2018-2019), during COVID-19 (2020-2021) and post-COVID-19 (2022-2023) periods. The pandemic altered capital-structure choices and market liquidity in emerging markets, for example, Indian listed firms adjusted leverage ratios in response to the shock, consistent with crisis-specific determinants of debt choice (Prakash et al., 2023).

RESEARCH TOOLS

Table 2: Variables used in the study (Chung & Pruitt, 1994; Dinc & Bilgin, 2020; Lei, 2020)

Factor	Symbol	Calculation
Firm value	FV	Tobin's Q*= (MV of Equity+BV of Debt) / (BV of TA)
		Natural logarithm of Market Cap.
Size of firm	SZ	Total tangible assets **/Total assets
Asset structure	AS	Current assets/Current liability
Liquidity	LQ	EPS/Stock market price
Growth	GW	ROE
Earning	EN	Interest Rate x Tax Rate
Tax shields	TX	EBIT + Depreciation – Taxes
Operating cash flow	OCF	Total debt/ Total equity***
Capital structure	DE	

* Tobin's Q*= (Market Value of Equity + Book Value of Debt) / (Book Value of Total Asset)
**Total tangible assets = Total assets - Total intangible assets
*** Capital structure is a dependent variable and is measured by total debt to equity (Ahmed et al., 2024)

The variable data and statistical values shown in Table 2 were processed using statistical software to determine the influence of variables affecting capital structure and firm value. We checked for abnormal values and removed incomplete data. Multiple Regression Analysis (MRA) was used to determine the influence of factors determining the capital structure and value of companies listed on the Stock Exchange of Thailand during each period. These periods include pre-COVID19, during COVID19, and post-COVID19 as intervening variables. Multicollinearity problems were prevented by testing the relationship between the independent variables using Pearson Correlation.

Table3: Correlation Matrix Pre Covid-19, During Covid-19, and Post Covid-19

Pre	SZ	AS	LQ	GW	EN
SZ	—				
AS	0.152	—			
LQ	0.623 ***	-0.028	—		
GW	0.078	0.046	0.204 *	—	
EN	0.535 ***	-0.038	0.484 ***	0.478 ***	—

TX	0.118	0.599 ***	-0.118	-0.122	0.218 *	0.160
OCF	0.177	0.731 ***	-0.071	-0.187	0.120	0.139
B	**SZ**	**AS**	**LQ**	**GW**	**EN**	
SZ	—					
AS	0.191	—				
LQ	0.746 ***	-0.030	—			
GW	-0.156	-0.098	0.036	—		
EN	-0.208 *	-0.418 ***	-0.180	0.128	—	
TX	0.155	0.521 ***	-0.183	-0.150	-0.043	-0.184
OCF	-0.062	0.588 ***	-0.311 **	-0.046	0.096	0.066
Post	**SZ**	**AS**	**LQ**	**GW**	**EN**	
SZ	—					
AS	0.105	—				
LQ	0.674 ***	0.086	—			
GW	0.038	0.251 *	0.170	—		
EN	0.306 **	0.227 *	0.301 **	0.615 ***	—	
TX	0.179	0.203 *	-0.213 *	-0.143	0.142	0.159
OCF	0.367 ***	0.373 ***	0.130	-0.069	0.202 *	0.146

Note: Entries are Pearson correlation coefficients (two-tailed);
significance codes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed).

Across all periods and variable pairs, $|r| < 0.80$, indicating no severe multicollinearity (Shrestha, 2020). Final multicollinearity diagnostics were based on VIF/Tolerance from the regression models (Table 4).

All three periods used the same model on the studied theories (Bollen, 2011) and applied the following standardized equations:

$$CS = \beta_1 SZ + \beta_2 AS + \beta_3 LQ + \beta_4 EN + \beta_5 GW + \beta_6 TX + \beta_7 OCF \ldots\ldots\ldots\ldots [1]$$
$$FV = \beta_8 CS \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [2]$$

Where:
CS = leverage (Debt/Equity), FV = firm value (Tobin's Q), and β = regression coefficient.

RESEARCH RESULTS

Analysis of the appropriate capital structure and value of companies listed on the Stock Exchange of Thailand from 2018-2023 defined three scenarios for the study: 1) Model 1 used data from 2018-2019, before the COVID-19 outbreak. 2) Model 2 used data from 2020-2021, during the COVID-19 outbreak. 3) Model 3 used data from 2022-2023, after the COVID-19 outbreak.

Multiple Regression Analysis was used for both the determinants of appropriate capital structure and the influence of appropriate capital structure on the value of companies listed on the SET across all three scenarios. These included Model 1: 2018-2019 Pre-COVID19, Model 2: 2021-2022 During COVID19, and Model 3: 2022-2023 Post-COVID19. The data were reanalyzed as follows:

Table 4: Determinants of Capital Structure (CS): Standardized (β) and One-Tailed p-values (Pre-, During-, and Post-COVID-19)

Predictors	Model of Pre COVID19				Model of COVID19				Model of Post COVID19			
	β	p	VIF	Tol	β	p	VIF	Tol	β	p	VIF	Tol
SZ	-0..954	0.078*	12.64	0.078	-0.465	0.390	13.19	0.074	-0.451	0.070*	16.03	0.062
AS	-0.172	0.025**	3.12	0.3208	-0.704	< .001***	2.45	0.408	-0.254	< .001***	1.29	0.7727
LQ	0.696	0.022**	3.10	0.3302	0.089	< .001***	2.99	0.335	0.685	0.002***	3.25	0.0755
EN	0.366	0.003***	2.92	0.3426	-0.040	0.203	1.59	0.629	0.391	< .001***	1.98	0.5048
GW	0.329	0.001***	2.28	0.4379	-0.025	0.305	1.10	0.906	0.347	< .001***	1.96	0.5113
TX	0.302	0.001***	5.14	0.1945	0.294	0.352	2.87	0.349	0.487	0.001***	5.74	0.1741
OCF	-0.203	0.024**	3.10	0.1408	-0.060	0.003***	3.70	0.271	-0.291	0.008***	3.36	0.2978
R^2		0.579				0.666				0.631		
R^2adj		0.577				0.662				0.629		

Note: One-tailed tests for directional hypotheses. Significance codes: * p<.10, ** p<.05, *** p<.01

Table 4 shows SZ was excluded from subsequent models due to multicollinearity (VIF>10) (James et al. 2013); see re-estimated results in Table 5.

Table 5: Determinants of Capital Structure (CS): Standardized (β) and One-Tailed p-values (Pre-, During-, and Post-COVID-19) (adjust)

Predictors	Model of Pre COVID19				Model of COVID19				Model of Post COVID19			
	β	p	VIF	Tol	β	p	VIF	Tol	β	p	VIF	Tol
AS	-0.172	0.025**	3.12	0.3208	-0.704	< .001***	2.45	0.408	-0.254	< .001***	1.29	0.7727
LQ	0.696	0.022**	3.10	0.3302	0.089	< .001***	2.99	0.335	0.685	0.002***	3.25	0.0755
EN	0.366	0.003***	2.92	0.3426	-0.040	0.203	1.59	0.629	0.391	< .001***	1.98	0.5048
GW	0.329	0.001***	2.28	0.4379	-0.025	0.305	1.10	0.906	0.347	< .001***	1.96	0.5113
TX	0.302	0.001***	5.14	0.1945	0.294	0.352	2.87	0.349	0.487	0.001***	5.74	0.1741
OCF	-0.203	0.024**	3.10	0.1408	-0.060	0.003***	3.70	0.271	-0.291	0.008***	3.36	0.2978
R^2		0.579				0.666				0.631		
R^2adj		0.577				0.662				0.629		

Note: One-tailed tests for directional hypotheses. Significance codes: * p<.10, ** p<.05, *** p<.01

The factors determining the appropriate capital structure were modeled according to standard values with the p-value in parentheses as follows:

$CS_{(Pre\ COVID\text{-}19)}$ = -0.172AS (p = 0.025) + 0.696LQ (p = 0.022) + 0.366EN (p = 0.003) + 0.329GW (p = 0.001) + 0.302TX (p = 0.001) - 0.203OCF (p = 0.024); R^2adj = 57.7%

$CS_{(COVID\text{-}19)}$ = -0.704AS (p < 0.001) + 0.089LQ (p < 0.001) - 0.040EN (p = 0.203) - 0.025GW (p = 0.305) + 0.294TX (p = 0.352) - 0.060OCF (p = 0.003); R^2adj = 66.2%

$CS_{(Post\ COVID\text{-}19)}$ = -0.254AS (p < 0.001) + 0.685LQ (p = 0.002) + 0.391EN (p < 0.001) + 0.347GW (p < 0.001) + 0.487TX (p = 0.001) - 0.291OCF (p = 0.008); R^2adj = 62.9%

As shown in Table 5, the factors determining the appropriate capital structure (CS) of companies listed on the Stock Exchange of Thailand (SET) include AS, LQ, GW, EN , TX, and OCF, in all three scenarios. Regarding the significance of the effect on CS, it is important to note that all variables were statistically significant only during the pre-COVID-19 and post-COVID-19 periods. In contrast, during COVID-19, AS remained negatively significant, LQ remained positively significant, and OCF remained negatively significant for CS. However, EN, GW, and TX were not statistically significant in this period. The multiple regression equations for all three scenarios did not exhibit multicollinearity issues, as indicated by the VIF and Tolerance values. Furthermore, the prediction levels of all variables in the equations were relatively high for all scenarios, with R^2 values ranging from 57.9% to 66.7%.

As the study posited directional hypotheses for the determinants of capital structure (CS) (H_{A2}-H_{A7}), the statistical significance was evaluated using one-tailed tests. Under this

approach, evidence was assessed only in the hypothesized direction; hence, effects opposite to the hypothesized sign did not support the hypothesis even if statistically different from zero.

However, if we consider the results of the 6 directional hypotheses (abbreviated): HA2: AS → CS (+), HA3: LQ → CS (−), HA4: GW → CS (−), HA5: EN → CS (−), HA6: TX → CS (+), HA7: OCF → CS (−), it is surprising to find that for some variables there is a statistically significant influence on CS, but in a different direction to that hypothesized. The corresponding results are shown in table 6 below.

Table 6: Summary of Directional Hypothesis Tests (One-Tailed).

Variable (Hypothesis)	Model of Pre COVID19			Model of COVID19			Model of Post COVID19		
	β	p	Hypothesis Supported	β	p	Hypothesis Supported	β	p	Hypothesis Supported
AS (HA2:+onCS)	-0.172	n.s.	No	-0.704	n.s.	No	).254	n.s.	No
LQ (HA3:-onCS)	0.696	n.s	No	0.089	n.s	No	0.685	n.s	No
EN (HA5:-onCS)	0.366	n.s	No	-0.040	n.s	No	0.391	n.s	No
GW (HA4:−onCS)	0.329	n.s	No	-0.025	n.s	No	0.347	n.s	No
TX (HA6:+onCS)	0.302	0.001***	Yes	0.294	n.s.	No	0.487	0.001***	Yes
OCF (HA7:−onCS)	-0.203	0.024**	Yes	-0.060	0.003**	Yes	-0.291	0.008**	Yes
R^2		0.579			0.666			0.631	
R^2adj		0.577			0.662			0.629	

Note: One-tailed tests for directional hypotheses. Significance codes: * p<.10, ** p<.05, *** p<.01; n.s. = not significant in the hypothesized direction.

Asset Structure (AS; H_{A2}: positive). Across all periods, AS exhibited negative associations with CS ($\beta < 0$), contradicting the hypothesized positive direction; thus, H_{A2} is not supported in any period. Substantively, firms with higher tangible asset intensity appear to rely less on debt.

Liquidity (LQ; H_{A3}: negative). LQ was found to have a positive effect in all periods (and substantively large pre- and post-COVID), running counter to the hypothesized negative effect. This means that companies with high liquidity have a higher proportion of debt, which does not support H_{A3}.

Earnings/Profitability (EN; H_{A5}: negative). EN had positive and sizeable effect in both pre- and post-COVID (contrary to H_{A5}) periods, and a slightly negative but not significant effect during COVID. Overall, H_{A5} was not supported. This indicates that companies with high profits show greater usage of debt.

Growth (GW; H_{A4}: negative). GW was positive and significant in magnitude in both pre- and post-COVID periods, with a small, non-significant negative coefficient during the COVID period. Consequently, H_{A4} is not supported. Growth opportunities in this sample are associated with higher leverage in normal times.

Tax Shield (TX; H_{A6}: positive). TX was positive and statistically significant pre- and post-COVID (one-tailed p = .001 in both periods), thus supporting H_{A6} in stable periods. During COVID, TX remained positive but was not significant, implying no directional support during crisis conditions.

Operating Cash Flow (OCF; H_{A7}: negative). OCF was negative and significant in all

three periods, consistently supporting H_{A7}. Firms with stronger internal cash generation rely less on debt, in line with canonical financing hierarchies.

Overview of Hypothesis Test Results. During both Pre- and Post-COVID periods, all six determinants showed economically meaningful effects on CS; however, only TX (positive) and OCF (negative) aligned with their respective directional hypotheses. AS, LQ, EN, and GW displayed effects in the opposite direction to that theorized. During COVID few determinants retained significance. OCF remained negative and significant (supporting H_{A7}), but TX, EN and GW are not significant. AS and LQ persisted to have signs opposite to their respective hypotheses. Overall OCF was the sole consistently supported directional determinant across all periods; TX was supported during normal conditions but not under pandemic stress. The remaining factors systematically diverged from classical predictions, suggesting context-specific financing behavior among listed companies in the SET.

Consequently, these findings provide a basis for further analysis of the influence of capital structure (CS) on firm value (FV) using simple regression for each scenario as outlined below:

Table 7: Model Coefficients – FV for 3 situations

Predictors	Model of Pre COVID19			Model of COVID19			Model of Post COVID19		
	b	β	p	b	β	p	b	β	p
constant	4.918		< .001***	5.683		< .001***	4.483		< .001***
CS	0.531	0.634	< .001***	0.022	0.114	= .302	0.525	0.604	< .001***
R^2	0.402			0.0130			0.366		
R^2adj	0.394			0.0127			0.361		

Note: Significance codes: * p < .10, ** p < .05, *** p < .01.

The results shown in table 7 indicate that capital structure (CS) could significantly determine firm value (FV) in pre-COVID19 and post-COVID19 scenarios, supporting the acceptance of hypothesis H_{A8} for these periods. In both periods, the influence of CS on firm value (FV) is of similar magnitude. The unstandardized coefficients (b) reflect the practical impact of each variable with the p-value in parentheses and the equations written as follows:

$$FV_{(Pre\ COVID\text{-}19)} = 4.918 + 0.531CS\ (p<0.001);\ R^2adj = 39.4\%$$

During the pre-COVID-19 period, for each 1 unit increase in CS, FV increases by 0.531units. The intercept value of 4.918 represents the baseline level of FV when CS is zero. The R^2 value of 36.4% indicates that CS explains 39.4% of the variation in FV during this period. The p-values are shown in parentheses.

$$FV_{(COVID\text{-}19)} = 5.683 + 0.022CS\ (p=.302);\ R^2adj = 1.27\%$$

During the COVID-19 period, no relationship between CS and FV was found at a statistically significant level of at least 0.05.

$$FV_{(Post\ COVID\text{-}19)} = 4.483 + 0.525CS(p<0.001);\ R^2adj = 36.1\%$$

In the Post COVID-19 period, each 1 unit increase in CS results in a 0.525 unit increase in FV. The intercept value of 4.483 represents the baseline level of FV when CS is zero. The R^2 value of 36.1% shows that CS explains 36.1% of the variation in FV, similar to the pre-COVID-19 period.

The three equations can be written in standardized equation from (β), with the relationship values expressed as follows:

$FV_{(Pre\ COVID\text{-}19)} = 0.634CS;\ R^2 = 39.4\%$

$FV_{(COVID\text{-}19)} = 0.114CS;\ R^2 = 1.27\%$

$FV_{(Post\ COVID\text{-}19)} = 0.604CS;\ R^2 = 36.1\%$

Firm value (FV) in pre- and post-COVID19 scenarios receives a positive influence from capital structure ranging between 0.604 and 0.634, with prediction values of 36.6% - 40.2%. In the pre-COVID19 scenario, a one-unit increase in capital structure results in a 0.634-fold increase in FV. In the post-COVID19 scenario, a one-unit increase in capital structure leads to a 0.604-fold increase in FV, at a significance level of 0.001.

During the COVID-19 scenario, there appears to be no significant influence of CS on increasing firm value (FV) at the 0.05 statistical level. This suggests that during the COVID-19 outbreak, changes in firm value did not result from changes in capital structure. However, after the COVID-19 outbreak, the relationship between CS and FV resembles that of the pre-COVID-19 period. To test the differences between groups, a one-way ANOVA of capital structure and firm value in each period (pre, post and during COVID-19, totaling 3 groups) was conducted at a 0.05 statistical significance level. The corresponding results are as follows:

Table 8: ANOVA

Source of Variance	Sum of Squares	df	Mean Square	F	p
Group CS	789	2	394.59	31.4	< .001***
Residuals CS	641	1266	12.58		
Group FV	15.9	2	7.964	30.9	< .001***
Residuals FV	326.3	1266	0.258		

Note: Significance codes: * p<.10, ** p<.05, *** p<.01

The test results for the differences between the three time periods show that both CS and FV differ in at least one pair. Therefore, a Post Hoc test using the Scheffe technique was performed to determine which pairs differ significantly. The consequent test results are shown in Table 9.

Table 9: Post Hoc Comparisons – Group FV and Group CS

Comparison FV							
Group		**Group**	**Mean Difference**	**SE**	**df**	**t**	**$p_{scheffe}$**
Pre Covid19	vs	Covid19	-0.1767	0.0350	1266	-5.04	< .001 ***
Pre Covid19	vs	Post Covid19	-0.0127	0.0349	1266	-0.75	0 .131
Covid19	vs	Post Covid19	-0.1640	0.0349	1266	-4.32	0.028 *

Note: Significance codes: * p<.10, ** p<.05, *** p<.01

Table 9 shows the results of the post hoc comparisons for FV and CS values. Statistically significant differences at the 0.05 level were observed in the comparisons between Pre-COVID-19 and During COVID-19, as well as between During COVID-19 and Post COVID-19. Specifically, the difference between Pre-COVID-19 and During COVID-19 was significant at the 0.05 level (p=0.028). However, the difference between Pre-COVID-19 and Post-COVID-19 was not statistically significant (p = 0.131), underscoring that the principal departure in firm value occurs during the pandemic.

SUMMARY OF FINDINGS AND DISCUSSION

This research aimed to assure investors that companies listed on the SET in the post-COVID-19 period can generate returns that meet investor expectations, similar to the pre-COVID-19 period. The study compares and discusses the pre- and post-outbreak periods as follows:

As the study specified directional hypotheses (H_{A2}–H_{A7}), regression results were interpreted using one-tailed significance (Tables 4–6), while the correlation test results shown in Table 3 remain two-tailed. Determinants of capital structure (CS) varied by period. During COVID-19, AS (negative), LQ (positive), and OCF (negative) remained statistically significant, whereas EN, GW, and TX were not significant. In pre- and post-COVID periods, all six determinants were significant; however, only TX (positive) and OCF (negative) aligned with the hypothesized directions, while AS was significantly negative, and LQ, EN, and GW were significantly positive, thereby not supporting H_{A2}–H_{A5} despite having statistical significance. Post hoc Scheffé tests indicated significant differences for the Pre vs During COVID-19 periods and During COVID-19 vs Post-COVID-19 periods. In contrast, the Pre vs Post COVID-19 difference was not significant (p = 0.131), underscoring that the principal departure in firm value occurs only during the pandemic.

The study found similar variables positively influencing capital structure (CS) in both pre- and post-COVID-19 scenarios; namely LQ, EN, GW and TX. In the pre-COVID-19 scenario, variables directly and positively influencing the appropriate financial structure of the SET-listed companies included Liquidity, Profitability, Growth, and Tax shielding. An increase in these four variables led to an increase in Capital Structure (Debt/Equity). This indicates that companies obtained more funding from borrowing than from equity to create liquidity. This includes actions such as increasing cash holdings, managing receivables and efficiently managing inventory. These actions lead to increased profitability and tax benefits from loan interest. These findings align with the trade-off theory proposed by Ross et al. (1995) which states that the optimal capital structure should maximize benefits from tax savings. In both pre- and post-COVID-19 scenarios, AS and OCF negatively influenced capital structure (CS). An increase in these factors reduced capital structure, indicating an increase in the shareholder proportion. These results contradict the findings of Li and Qiu (2023), which identified that large companies with substantial investments can create debt at lower costs. The results also differ from the study of Boasiako et al. (2022) which stated that tangible assets positively relate to capital structure due to borrowing for fixed asset acquisition. These study results reveal that most SET-listed companies raise capital from shareholders to acquire tangible assets. The negative influence of cash flow proportion on capital structure demonstrates that companies with liquidity and sufficient cash flow can efficiently repay loans. This aligns with Fischer and Jensen's (2019) proposal that beyond the tax benefits from debt interest (debt tax shield), debt also affects companies by reducing net profits, also resulting in lower taxes. Although this study found that the profitability of SET-listed companies positively influences their capital structure in the pre-COVID-19 period, this results from Thailand's attractive economic conditions for investors. Government policies favor foreign investment and provide tax

benefits for importing goods from certain source destinations, reducing production costs compared to other countries. Skilled labor and good corporate governance in the SET-listed companies lead domestic and foreign creditors and shareholders to recognize efficient operational capabilities and high profitability potential. During the COVID-19 period, asset structure (AS) remained negatively significant, liquidity (LQ) remained positively significant, and operating cash flow (OCF) remained negatively significant for capital structure; by contrast, earnings (EN), growth (GW), and tax shields (TX) were not statistically significant determinants. This aligns with Agency theory, which states that when profitability decreases, it results in increased capital structure due to the higher borrowing proportion. Companies will pay greater loan interest, reducing net profits.

The study of firm value (FV) in the pre- and post-COVID-19 scenarios shows consistency in the positive relationship between appropriate capital structure and the value of the SET-listed companies with statistical significance. This indicates that when companies increase external funding, it positively impacts firm value despite increased interest costs. However, it also demonstrates company credibility, as management are able to borrow money to create wealth and returns according to shareholder demands. This aligns with Vargas et al.'s (2022) study, which found that capital structure has an indirect positive affect on firm value. Managers use debt proportions higher than equity in an appropriate capital structure to increase shareholder wealth. Most investors perceive debt creation as a positive signal, indicating that the company will have high future growth opportunities from the increased investment, allowing them to borrow money for company asset investments. The re-emergence of the positive leverage value association in the post-COVID period supports evidence from emerging markets that leverage resumes its valuation role after crisis conditions subside (e.g., Vietnam). Yet, market-microstructure channels such as stock liquidity can suppress debt usage, potentially explaining sign reversals for liquidity and tangibility in Thailand (Ahmed et al., 2024).

This study examined period heterogeneity in the determinants of capital structure (CS) and their links with firm value (FV) for Thai listed firms across the pre-, during-, and post-COVID-19 periods. Using panel regressions with one-tailed tests to assess the directional hypotheses and one-way ANOVA for FV comparisons, three main findings are documented. First, during COVID-19 only asset structure (AS, negative), liquidity (LQ, positive), and operating cash flow (OCF, negative) remained statistically significant determinants of CS, whereas earnings (EN), growth (GW), and tax shields (TX) did not. Second, in the pre- and post-COVID-19 periods all six determinants yielded statistically significant results; however, only TX (positive) and OCF (negative) aligned with the directional hypotheses, indicating systematic departures from classical predictions for AS, LQ, EN, and GW in the Thai context. Third, the relationship between CS and FV was significant before and after the pandemic but not during the pandemic, highlighting a crisis-specific decoupling between leverage choices and market valuation. These results advance evidence of capital-structure in an emerging market by showing how financing behavior shifts across phases of a large exogenous shock. OCF consistently reduces leverage in all periods, while the role of TX materializes primarily in normal times. Policy-wise, the findings speak to SDG 8 (Decent Work and Economic Growth): calibrating liquidity backstops and tax instruments to the business cycle can help firms sustain investment and employment with lower reliance on debt during downturns. Our pooled OLS design risks endogeneity reverse causality between leverage and firm value and omitted factors (e.g., stock market liquidity, ESG). Future studies should use firm and year fixed effects with firm clustered errors, and consider IV (e.g., lagged industry leverage, policy shocks) or dynamic estimators (system GMM), to test alternative leverage (D/A, long-term, market/net) and valuation measures (Q variants, market-to-book).

REFERENCES

Ahmed, A. M., Nugraha, D. P., & Hágen, I. (2024). Assessing the impact of COVID-19 on capital structure dynamics: Evidence from GCC economies. *Economies*, *12*(5), 103. https://doi.org/10.3390/economies12050103

Bai, C., Duan, Y., Fan, X., & Tang, S. (2023). Financial market sentiment and stock return during the COVID-19 pandemic. *Finance Research Letters, 54*, Article 103709. https://doi.org/10.1016/j.frl.2023.103709

Boasiako, K. A., Manu, S. A., & Antwi-Darko, N. Y. (2022). Does financing influence the sensitivity of cash and investment to asset tangibility? *International Review of Financial Analysis, 80,* Article 102055.

Caban-Garcia, M. T., Choi, H., & Kim, M. (2020). The effects of operating cash flow disclosure on earnings comparability, analysts' forecasts and firms' investment decisions during the Pre-IFRS era. *The British Accounting Review*, *52*(4), 100883. https://doi.org/10.1016/j.bar.2020.100883

Cuevas-Vargas, H., Cortés-Palacios, H. A., & Lozano-García, J. J. (2022). Impact of capital structure and innovation on firm performance: Direct and indirect effects of capital structure. *Procedia Computer Science,199*(2022), 1082–1089. https://doi.org/10.1016/j.procs.2022.01.137

Dao, B. T. T., & Ta, T. D. N. (2020). A meta-analysis: Capital structure and firm performance. *Journal of Economics and Development, 22*(1), 111-129. https://doi.org/10.1108/JED-12-2019-0072

Dempsey, M. (2019). Financial leverage: The value of the firm and the economic cycle. In *Investment analysis* (pp. 53–76). Routledge. https://doi.org/10.4324/9780429424397-4

Dinc, Y., & Bilgin, R. (2020). Panel data on factoring payables and financial ratios of publicly listed firms in Turkey over 2012–2017. *Data in Brief, 28*(104898). 1-4. https://doi.org/10.1016/j.dib.2019.104898

Do, H. X., Nguyen, N. H., & Nguyen, Q. M. P. (2022). Financial leverage and stock return comovement. *Journal of Financial Markets, 60*, Article 100699. https://doi.org/10.1016/j.finmar.2021.100699

Fischer, M., and Jensen, B. A. (2019). The debt tax shield, economic growth and inequality. *Journal of Economic Perspectives, 33*(4), 112-134.

Han, H., Liu, C., & Li, J. (2024). Managerial overconfidence and stock price crash risk. *Finance Research Letters*, *65*, 105518. https://doi.org/10.1016/j.frl.2024.105518

Jadiyappa, N., Hickman, L. E., Jyothi, P., Vunyale, N., & Sireesha, B. (2020). Does debt diversification impact firm value? Evidence from India. *International Review of Economics & Finance*, *67*, 362-377.

Jaisinghani, D., and Kanjilal, K. (2017). Non-linear dynamics of size, capital structure and profitability: Empirical evidence from the Indian manufacturing sector. *Asia Pacific Management Review, 22*, 159-165. https://doi.org/10.1016/j.apmrv.2016.12.003

James, S. D., Leiblein, M. J., & Lu, S. (2013). How firms capture value from their innovations. *Journal of Management, 39*(5), 1123-1155.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance and takeovers. *The American Economic Review, 76*, 323-329.

Jensen, M. C., and Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360.

Keefe, M. O. C., and Nguyen, P. H. (2023). The influence of cash flow volatility on firm use of debt of different maturities or zero-debt: International evidence. *International Review of Economics and Finance, 84*, 684-700.

Kimmel, P., and Warfield, T. D. (1995). The usefulness of hybrid security classifications:

Evidence from redeemable preferred stock. *The Accounting Review, 70*(1), 151–167. http://www.jstor.org/stable/248393

Kraus, A., and Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, *28*(4), 911–922. https://doi.org/10.2307/2978343

Le, H. T. M., Lai, C. P., Phan, V. H., & Pham, V. T. (2024). Financial reporting quality and investment efficiency in manufacturing firms: The role of firm characteristics in an emerging market. *Journal of Competitiveness, 16*(1), 62–78.

Lindenberg, E. B., and Ross, S. A. (1981). Tobin's Q ratio and industrial organization. *Journal of Business*, *54*, 1-32. https://doi.org/10.1086/296120

Li, X. M., and Qiu, M. (2021). The joint effects of economic policy uncertainty and firm characteristics on capital structure: Evidence from US firms. *Journal of International Money and Finance*, *110*, Article 102279.

Liu, H., Chiang, Y.-M., & Tsai, H.-J. (2020). The impact of loan rollover restrictions on capital structure adjustments, leverage deviations and firm values. *Pacific-Basin Finance Journal*, *62*, 101384. https://doi.org/10.1016/j.pacfin.2020.101384

Modigliani, F., and Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, *48*, 261-297.

Modigliani, F., and Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *The American Economic Review*, *53*, 433-443.

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics, 5*, 147-175. https://doi.org/10.1016/0304-405X(77)90015-0

Myers, S. C., and Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*, 187-221. https://doi.org/10.1016/0304-405X(84)90023-0

Nguyen, H. M., Wong, W. K., & Vuong, T. H. G. (2023). Market capitalized scale and corporate capital structure: Evidence from CSI300's listed firms. *Annals of Financial Economics, 18*(3), 1–23.

Perfect, S. B., and Wiles, K. W. (1994). Alternative constructions of Tobin's Q: An empirical comparison. *Journal of Empirical Finance, 1*(3-4), 313-341.

Phokachai, T. (2023). What kind of investment do you choose? When consumer behavior after COVID-19 is not the same. *Investor Knowledge Development Department, The Stock Exchange of Thailand*. Retrieved May *18,* 2024, from https://www.setinvestnow.com

Prakash N, Maheshwari A, Hawaldar A (2023), 'The impact of Covid-19 on the capital structure in emerging economies: evidence from India'. *Asian Journal of Accounting Research*, *8*(3) pp. 236–249, doi: https://doi.org/10.1108/AJAR-05-2022-0144

Ross, S. A., Westerfield, R. W., & Jordan, B. D. (1995). *Fundamentals of corporate finance* (11th ed.). McGraw-Hill.

Siqueira, A. C. O., Guenster, N., Vanacker, T., & Crucke, S. (2018). A longitudinal comparison of capital structure between young for-profit social and commercial enterprises. *Journal of Business Venturing, 33*(2), 225-240. https://doi.org/10.1016/j.jbusvent.2017.12.006

Singhal, N., Goyal, S., Sharma, D., Sharma, D., Kumari, S., & Nagar, S. (2022). Capitalization and profitability: Applicability of capital theories in BRICS banking sector. *Future Business Journal, 8*, (30), 1-13. https://doi.org/10.1186/s43093-022-00140-w

Vuong, T. H. G., Wu, Y. C., Weng, T. C., Nguyen, H. M., & Vo, X. V. (2023). Capital structure choices and stock market volatility: Evidence from Chinese listed firms. *The Chinese Economy, 56*(1), 25–49.

Zhao, J., Li, X., Yu, C., Chen, S., & Lee, C. (2022). Riding the fintech innovation wave: Fintech, patents and bank performance. *Journal of International Money and Finance, 122,* Article 102552. https://doi.org/10.1016/j.jimonfin.2021.102552