MODERATED MODERATION EFFECTS OF DEBT AND FIRM SIZE ON CASH HOLDINGS AND DIVIDEND PAYOUTS

Penprapak Manapreechadeelert[1]

ABSTRACT

This study contributes new insights into dividend policy by investigating how debt levels and firm size moderate the relationship between cash holdings and dividend payouts. Grounded in the MM theory of capital structure, the research challenges the traditional assumption of dividend irrelevance by incorporating real-world financial constraints and governance dynamics. The sample consists of 475 non-financial firms listed in Thailand, covering data from 2019 to 2023. Using Hayes's PROCESS Macro for moderated moderation analysis, the findings reveal that cash holdings positively influence dividend payouts, and this effect is contingent upon both the firm's leverage and size. Specifically, small firms with low debt levels tend to offer higher dividend payout, whereas large firms with below-average industry debt show diminished dividend payouts. This interaction presents a novel theoretical contribution by linking liquidity management, capital structure, and firm scale in explaining dividend behavior dimensions that have rarely been integrated in prior research. The study extends the existing literature on investment returns and corporate financial policy and provides practical implications for investors and corporate decision-makers operating in emerging markets.

Keyword: cash holdings, dividend payouts, MM theory

1. INTRODUCTION

Some profitable companies choose to reduce or withhold dividend payouts despite strong earnings. This phenomenon has drawn considerable academic interest as it contradicts conventional expectations regarding the positive association between profitability and dividend policy. Understanding the determinants of dividend payout is therefore essential for explaining how firms balance internal financing needs, investment opportunities, and shareholder expectations under varying market conditions. Although dividend-paying firms are often viewed as financially stable, empirical evidence shows substantial variation in payout behavior across firms and industries, highlighting the importance of examining firm-specific factors such as liquidity conditions, financial constraints, and governance characteristics.

Recurring themes in the dividend literature identify two central considerations. First, firms may pay dividends to establish financial credibility and reduce information asymmetry, whereas others may retain earnings to reinvest in future growth opportunities (Fama & French, 2002). This divergence contributes to heterogeneity in dividend policy across firms. Second, empirical studies consistently demonstrate that cash holdings are closely associated with dividend payouts (Al-Najjar & Belghitar, 2011; Jia & McMahon, 2019; Houqe et al., 2023).

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Meanwhile, the dividend irrelevance theory of Miller and Modigliani (1961) suggests that cash holdings and dividends in a frictionless market. However, real-world conditions characterized by information asymmetry, financing constraints, and agency conflicts, make cash availability an important determinant of dividend decisions. Firms with stronger liquidity positions, larger asset bases, and broader access to external financing often exhibit higher dividend payouts. Likewise, companies holding substantial internal reserves and low leverage tend to maintain stable dividend policies Within this context, cash holdings, debt levels, and firm size play critical roles in shaping dividend payout behavior (Redding, 1997; Brockman & Unlu, 2009). Building upon this evidence, the present study empirically examines the relationship between cash holdings and dividend payouts, with a focus on how debt and firm size moderate this relationship among Thai-listed firms. This analytical approach follows the moderated moderation framework of Hayes, enabling a nuanced investigation of the combined influence of financial leverage and organizational scale on payout behavior. This study offers two main contributions to the literature. First, it provides new empirical evidence on how cash holdings affect dividend payouts within the context of an emerging market. Second, it advances theoretical understanding by examining how debt and firm size jointly moderate the relationship between cash holdings and dividend payouts - an interaction effect that existing studies have rarely investigated simultaneously. By incorporating these elements, the study enhances insights into how firm-specific financial structures shape dividend behavior in the Thai capital market.

The remainder of this paper is organized as follows. Section 2 presents the theoretical framework and develops the research hypotheses. Section 3 outlines the empirical methodology, including sample selection, variable definitions, and the Hayes moderated moderation model. Section 4 reports the findings from the correlation and regression analyses. Section 5 discusses the theoretical and practical implications of the results and concludes with directions for future research.

2. THEORETICAL, LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Cash Holding and Dividend Payout

Dividend policy plays a central role in corporate financial decision-making as dividend payout directly affects shareholder wealth and signals managerial expectations regarding future performance. Meanwhile, the dividend irrelevance proposition of Miller and Modigliani (1961) (MM theory) posits that payout decisions do not influence firm value in a frictionless market, real-world conditions characterized by information asymmetry and agency conflicts make dividends an important mechanism for reducing uncertainty and strengthening investor confidence (Alsultan & Hussainey, 2023).

Signaling theory suggests that firms use dividend payouts to convey credible information about future cash flows and financial stability (Gordon, 1959). At the same time, agency theory emphasizes that dividends mitigate conflicts between managers and shareholders by reducing the volume of free cash flow under managerial discretion, thereby limiting overinvestment and managerial opportunism (Jensen, 1986). Consistent dividend distributions can therefore enhance governance quality by constraining discretionary spending and reinforcing external monitoring (Lintner, 1956, La Porta et al., 2000). Cash holdings are closely linked to dividend decisions. Firms with higher levels of cash are better positioned to maintain stable payouts, particularly when external financing is costly or when investment opportunities are limited. Empirical evidence confirms that firms facing liquidity constraints tend to accumulate cash reserves to ensure future dividend capacity (Keynes, 1964; Han & Qiu, 2007; Jia & McMahon, 2019), while reductions in dividends often trigger negative market

reactions due to the perception of weakening performance (Skinner, 2008; Karpavičius, 2014; Shamsabadi et al., 2016).

As maintaining dividend stability is important for firm reputation and shareholder expectations, firms are likely to hold sufficient cash to support payout decisions. Given this theoretical and empirical foundation, cash holdings are expected to positively influence dividend payouts. Therefore, the first hypothesis is proposed as follows:

H1. Cash holdings positively affect dividend payouts.

2.2 The Moderating Effect of Debt and Firm Size on the Relationship between Cash Holdings and Dividend Payouts

The Effect of Debt and Firm Size on Previous Dividends

Previous dividend payout has been considered the primary indicator of a company's capacity to pay dividends, as management is anticipated to uphold a stable dividend policy. Moreover, the information asymmetry theory posits that dividend policy tends to remain "sticky" or consistent with past dividend levels (Black, 1976).

The Effect of Debt on Dividend Payouts

Agrawal and Jayaraman (1994) provide support for Jensen's (1986) hypothesis that dividends and debt serve as substitute mechanisms for controlling the agency costs of free cash flow. The dividend payout ratios of a sample of all-equity firms are significantly higher than those of a control group of levered firms. Debt can affect a firm's ability to pay dividends, as borrowing entails fixed financial obligations such as interest and principal payments. Failure to meet these payments promptly may expose the firm to the risk of liquidation and insolvency. Consequently, increased debt is likely to lead to lower dividend payouts. Additionally, certain loan terms may impose restrictions on dividend payouts. Benavides et al. (2016) and Alsultan and Hussainey (2023) found a significant negative relationship between debt and dividend payout. Therefore, a negative association between dividends and debt is anticipated. The debt ratio (total liabilities divided by total assets, calculated in book value terms) serves as a proxy for debt. Based on these findings, the following hypothesis is proposed:

H2. Debt negatively affects dividend payouts.

The Effect of Firm Size on Dividend Payouts

The dividend policy of a company may vary depending on its size. Larger companies generally have better access to capital markets, allowing them to rely less on internal resources when seeking external financing (Redding, 1997). Additionally, larger companies are less susceptible to bankruptcy and more inclined to distribute dividends to their shareholders. Consequently, the reliance on internal financing decreases as the firm's size increases, leading to an expectation of higher dividend distributions in larger companies. Moreover, the influence of company size on payouts underscores agency issues. The agency problem, characterized by the challenges and costs associated with monitoring, is purported to escalate with the firm's size (Alsultan & Hussainey, 2023). Hence, dividends may serve as a mechanism to mitigate the agency problem. Furthermore, larger companies are often presumed to have greater access to capital markets, as evidenced by the positive correlation between dividend payout and size (La Porta et al., 2000). Firm size in this analysis is represented by the natural logarithm of its assets. Based on these findings, the following hypothesis is proposed:

H3. Firm size positively affects dividend payouts.

The Effect of Debt and Firm Size on Dividend Payouts

While debt and firm size individually influence dividend decisions, their combined

effect provides deeper insight into how firms manage excess cash. Agency theory and the free cash flow hypothesis suggest that debt serves as a disciplinary mechanism that limits managerial discretion over cash holdings, whereas firm size reflects a firm's access to external financing, monitoring intensity, and informational transparency. The interaction between these two factors is therefore expected to shape how managers use excess cash, especially in determining whether cash is retained or distributed as dividends. Firms with high debt and large size often face stronger external monitoring from creditors, credit rating agencies, and capital markets. This heightened scrutiny reduces managerial discretion and increases the likelihood that excess cash will be distributed as dividends rather than retained. In contrast, firms with high debt but small size typically face more severe liquidity constraints, limited access to capital markets, and higher bankruptcy risk. These firms are more inclined to retain cash to protect financial flexibility, which weakens the positive effect of cash holdings on dividend payouts. Similarly, when debt is low, large firms may still choose to distribute dividends due to lower financial constraints and stronger reputations, whereas small low-debt firms may retain cash to buffer against uncertainty. These conditional scenarios illustrate that the dividend cash holdings relationship does not depend on debt or firm size alone, but rather on their interaction. Based on this theoretical reasoning, it is expected that debt and firm size jointly moderate the relationship between cash holdings and dividend payouts. Accordingly, the following hypothesis is proposed:

H4. Debt and firm size jointly moderate the relationship between cash holdings and dividend payouts.

3. RESEARCH DESIGN

The following paragraph provides a descriptive explanation of the conceptual model presented in Figure 1 below. Cash holding is specified as the primary independent variable expected to influence dividend payouts, the dependent variable, while debt and firm size are incorporated as moderating variables that condition this relationship.

Figure 1. Research Model
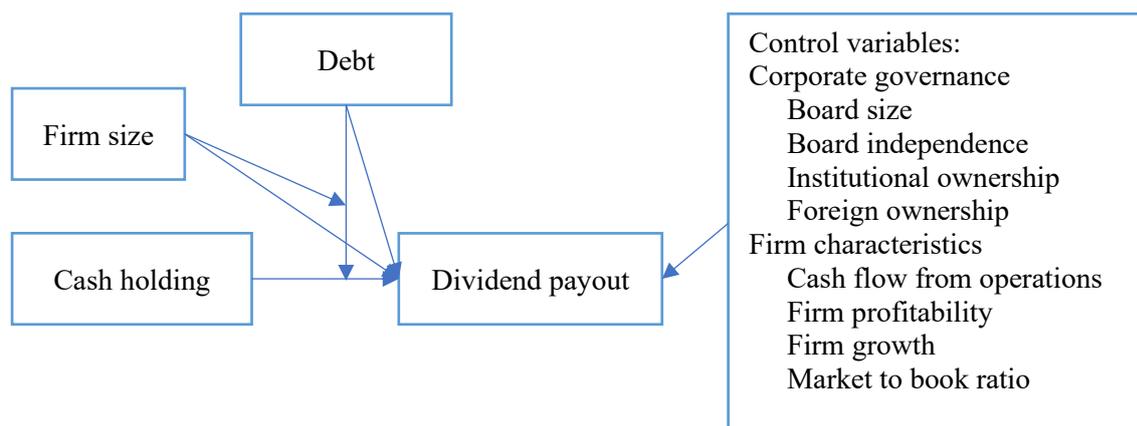
Source: Created by authors

3.1 Hypothesis Testing Model

To empirically test H1-H4, which investigate the moderating roles of corporate debt (DEBT) and firm size (SIZE) on the relationship between cash holdings (CH) and dividend payout (DIVIDEND), this study employs a moderated moderation analysis using the PROCESS regression framework proposed by Hayes (2022). The following model

specification is estimated:

$$Dividend_{it} = \beta_0 + \beta_1 CASH_{it} + \beta_2 DEBT_{it} + \beta_3 SIZE_{it} + \beta_4 CASH_{it}*DEBT_{it} + \beta_5\ CASH_{it}*SIZE_{it}$$
$$+ \beta_6\ DEBT_{it}*SIZE_{it} + \beta_7 CASH_{it}*DEBT*SIZE_{it} + \beta_8 BSIZ_{it} + \beta_9 BIND_{it}$$
$$+ \beta_{10}INSO_{it} + \beta_{11}FORO_{it} + \beta_{12}CFO_{it} + \beta_{13}ROA_{it} + \beta_{14}GRO_{it} + \beta_{15}MTB_{it}$$
$$+ \Sigma\ INDUSTRY + \Sigma\ YEAR + \varepsilon_{it}$$

Where:

Dividend ($_{it}$)	= Dividend payout
CASH ($_{it}$)	= Cash holdings
DEBT ($_{it}$)	= Firm debt
SIZE ($_{it}$)	= Firm size
BSIZ ($_{it}$)	= Board size
BIND ($_{it}$)	= Board independence
INSO ($_{it}$)	= Institutional ownership
FORO ($_{it}$)	= Foreign ownership
CFO ($_{it}$)	= Cash flow from operations
ROA ($_{it}$)	= Firm profitability
GRO ($_{it}$)	= Firm growth
MTB ($_{it}$)	= Market to book ratio

where *i* refers to a firm *i* and *t* the time. It is noted that the number of firms exceeds the time observed; and ε_{it} is the specific error term. The moderating effect of debt and firm size is detected when the coefficient β_7 is significant.

3.2 Sample Selection

The sample selection comprised firms listed on the Thai Stock Exchange between 2019 and 2023, excluding financial institutions such as banks and insurance firms. These firms were excluded because their capital structures, financial reporting practices, and regulatory requirements differ substantially from non-financial firms, making them unsuitable for comparative analysis. Following Cornett et al., (2010), extending the time horizon to more than five years helps mitigate concerns regarding the reliability of accounting data. Firm-years lacking essential variables and outliers were removed. The final sample consisted of 2,375 firm-year observations from 475 publicly listed firms across seven industries, with all data retrieved from SETSMART. Table 1 presents the sampling process and distribution across industries.

Table 1. Sample Selection and Distribution of Companies by Industry

Sample selection		Industry	Firm-year observation	%
Initial sample	683	Agro & Food Industry	295	12.42
Financial and insurance firms	68	Consumer Products	180	7.58
Real estate investment trust	67	Industrials	425	17.89
Firms with insufficient data and outliers	73	Property & Construction	465	19.58
Final sample	475	Resources	255	10.74

Period	5	Services	570	24.00
		Technology	185	7.79
Total	2,375		2,375	100

Source(s): Created by authors.

3.3 Measuring Variables

3.3.1 Dependent Variables. Dividend payout was measured using dividend yield, calculated as:

$$Dividend\ Yield = \frac{Annual\ Dividend}{Stock\ Price\ at\ Year - End}$$

This follows the measurement approach of Fuller & Goldstein (2011) and Farooq et al. (2024).

3.3.2 Independent Variables. Cash holdings was measured using cash and cash equivalents scaled by total assets:

$$Cash\ Holdings = \frac{Cash\ and\ Cash\ Equivalents}{Total\ Assets}$$

Consistent with Al-Najjar & Belghitar (2011) and Houqe et al. (2023).

3.3.3 Moderator Variables.

• **Debt:** measured as the debt ratio
$$Debt\ Ratio = \frac{Total\ Liabilities}{Total\ Assets}$$

As per Benavides et al (2016) and Alsultan & Hussainey (2023).

• **Firm Size:** measured as the natural logarithm of total assets:
$$Firm\ Size = ln\ (Total\ Assets)$$

Following La Porta et al. (2000) and Alsultan & Hussainey (2023).

3.3.4 Control variables. Other influential firm and governance characteristics have been retained with clear definitions, such as:
- Board size (number of directors)
- Board independence (independent directors divided by total directors)
- Institutional ownership (institutional shares divided by total shares)
- Foreign ownership (foreign shares divided by total shares)
- Cash flow from operations (CFO divided by total assets)
- Profitability (net income divided by total assets)
- Firm growth (sales growth rate)
- Market-to-book ratio

All definitions follow established prior studies (Shamsabadi et al., 2016; Baker et al., 2020; Boshnak, 2023; Farooq et al., 2024).

4. RESULTS AND DISCUSSION

4.1 Descriptive Analysis

Table 2. Frequencies of Firm Pay Dividend

YEAR	Non-pay dividend	Pay dividend	% Pay dividend	INDUS	Non- pay dividend	Firm pay dividend	% Pay dividend
2019	121	354	74.53	ARGO	70	225	76.27
2020	122	353	74.32	CONSUME	54	126	70.00
2021	138	337	70.95	INDUS	121	304	71.53
2022	165	310	65.26	PROPCON	146	319	68.60
2023	148	327	68.84	RESOURC	71	183	72.05
Total	694	1,681	70.78	SERVICE	184	386	67.72
				TECH	48	138	74.19
				Total	694	1,681	70.78

Source(s): Created by authors.

Table 2 illustrates that the number of firms paying dividends totals a sample size of 1,681, which is relatively high. On average, 70.78% of the firms in this sample paid dividends each year, indicating that dividend-paying behavior is relatively common among Thai listed companies.

Table 3. Descriptive Statistics

Variable	Observation	Mean	Std. Dev	Min	Max
Dividend *(%)*	2,375	2.818	2.814	0	10.221
CASH *(times)*	2,375	0.094	0.081	0.002	0.288
DEBT *(times)*	2,375	0.427	0.215	0.004	1.627
lnSIZE	2,375	15.814	1.572	11.96	21.95
BSIZ *(person)*	2,375	9.977	2.423	5	21
BIN *(%)*	2,375	43.137	9.548	33.33	100
INSO *(%)*	2,375	10.153	15.131	0	96.66
FORO *(%)*	2,375	7.969	15.085	0	49.00
CFO *(%)*	2,375	0.047	0.103	-0.689	0.189
ROA *(times)*	2,375	0.058	0.068	-0.048	0.315
GRO *(times)*	2,375	0.041	0.196	-0.317	0.391
MTB *(times)*	2,375	1.658	1.452	0.338	6.659

Source(s): Created by authors.
Note(s): Table 3 displays the descriptive statistics for the variables under consideration. The dependent variable is the dividend payout. The independent variable is cash holdings and the moderator variables are debt and firm size. Corporate governance is a control variable, consisting of board size, board independence, institutional ownership, foreign ownership, and firm-specific characteristics such as cash flow from operations, firm profitability, firm growth, and market-to-book ratio.

Table 3 presents the descriptive statistics for the variables. The mean value of dividend payout is 2.818%, ranging from 0 to 10.221%. The firms in the sample have an average cash

holding of 0.094 times, with minimum and maximum cash holdings of 0.002 and 0.288, respectively. The average value of debt is 0.427 times, with minimum and maximum levels of debt being 0.004 and 1.627, respectively. The average firm size, represented in natural log form, is 15.814. Furthermore, Table 3 includes descriptive statistics of the corporate governance and firm-specific variables. Regarding board size, the average is 9.977, with minimum and maximum values of 5 and 21, respectively. The fraction of independent directors on the board varies from 33 to 100%, with a mean of 43.137%. The range of institutional ownership spans from 0 to 96.66%, with a mean of 10.153%. The average level of foreign ownership in the sample firms is 7.969%, with minimum and maximum values of 0% and 49.00%, respectively. On average, the firms in the sample have a value of cash flow from operations to total assets of 0.047 times. The mean value of profitability, as measured by return on assets, is 0.058 times. The sample firms have a sales growth of 0.041 times, indicating additional sales. The market-to-book ratio shows a mean of 1.658, suggesting that, on average, firms have positive expected future earnings.

4.2 Correlation Analysis

Correlation analysis was conducted to check for any possible multicollinearity issues among variables, and the results are presented in Table 4. According to Alsultan and Hussainey (2023), any correlation coefficient value above 0.7 indicates a multicollinearity issue in the data. Based on the sample data, none of the correlation coefficients between the independent variables exceeds 0.5. Therefore, it can be concluded that there is no multicollinearity between the variables. Furthermore, the test result for the variance inflation factor (VIF) is presented in Table 4. O'brien (2007) remarks that a VIF value of less than 10 indicates the absence of multicollinearity among the data. The results in Table 4 therefore also confirm that the data are free from collinearity issues, as there is no VIF value greater than 10.

Table 4. Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Tolerance	VIF
(1) CASH	1.000												0.757	1.322
(2) DEBT	-.375**	1.000											0.667	1.500
(3) SIZE	-.041*	.112**	1.000										0.486	2.059
(4) BSIZ	.051*	-0.026	.446**	1.000									0.893	1.120
(5) BIND	-.066**	.073**	.064**	-.247**	1.000								0.648	1.543
(6) INSO	-0.031	.043*	.287**	.178**	0.019	1.000							0.859	1.164
(7) FORO	0.035	0.027	.223**	0.013	-0.036	.149**	1.000						0.891	1.122
(8) CFO	.189**	-.153**	-0.016	.051*	-.052*	-0.020	-0.027	1.000					0.863	1.159
(9) ROA	.101**	-.101**	.072**	0.040	-0.006	0.023	-0.002	.143**	1.000				0.699	1.430
(10) GRO	0.019	-0.029	.096**	-0.016	.043*	0.017	0.030	0.007	.266**	1.000			0.789	1.267
(11) MTB	0.035	0.019	.064**	0.026	-0.012	.064**	0.022	.122**	.377**	.100**	1.000		0.718	1.392
(12) Dividend	.051*	-0.037	.070**	.074**	0.007	0.020	0.025	.060**	.345**	-.067**	-.082**	1.000		

Note(s): Table 4 presents the correlation results of the variables in the study. The independent variable is cash holdings, the moderator variables comprise debt and firm size, and the control variable is corporate governance, incorporating board size, board independence, institutional and foreign ownership, and firm-specific characteristics (comprising cash flow from operations, profitability, firm growth, and market-to-book ratio).
***p < 0.01, **p < 0.05, *p < 0.1

4.3 Andrew Hayes Process Regression analysis

Table 5. Linear Regression and Moderated Moderation Analysis of the Relationship between Cash Holdings and Dividend Payouts: The Moderating Roles of Debt and Firm Size.

	Effect	*SE*	*t*	*p-value*	LLCI	ULCI
constant	1.66	0.43	3.82	0.000	0.81	2.51
CASH (H1)	-0.43	0.72	-0.59	0.553	-1.84	0.99
DEBT (H2)	-0.35	0.29	-1.21	0.228	-0.91	0.22
SIZE (H3)	0.08	0.05	1.67	0.096	-0.01	0.17
CASH x DEBT	6.03	3.37	1.79	0.074	-0.59	12.65
CASH x SIZE	-1.26	0.47	-2.68	0.007***	-2.17	-0.34
DEBT x SIZE	0.26	0.16	1.60	0.110	-0.06	0.58
CASH x DEBT x SIZE (H4)	6.00	2.19	2.73	0.006***	1.70	10.30
BSIZ	0.09	0.03	3.49	0.001***	0.04	0.14
BIND	0.73	0.57	1.28	0.201	-0.39	1.84
INSO	0.00	0.00	0.49	0.624	-0.01	0.01
FORO	0.00	0.00	0.09	0.928	-0.01	0.01
CFO	0.62	0.52	1.20	0.231	-0.40	1.64
ROA	19.20	0.89	21.46	0.000***	17.44	20.95
GRO	-2.39	0.29	-8.26	0.000***	-2.95	-1.82
MTB	-0.39	0.04	-9.43	0.000***	-0.47	-0.31
Year/Industry dummy				*Included*		
R^2				0.25		
ΔR^2				0.02		
F				31.54***		

Note(s): N = 2,375. Unstandardized regression coefficients are reported.
, * *Denote significance at the 0.05, and 0.01 levels, respectively.*
Source(s): Created by authors

Hypotheses Testing

H1: Cash holdings positively affect dividend payouts. The regression results shown in Table 5 indicate that cash holdings do not have a statistically significant direct effect on dividend payouts (β = -0.43, p = 0.553). Although the coefficient is negative, the effect is weak and not statistically distinguishable from zero, suggesting that contrary to the initial expectation higher cash reserves do not independently lead firms to increase dividend payouts. This finding does not support H1. The absence of a direct effect is consistent with prior studies indicating that dividend decisions are not driven solely by liquidity levels, particularly in emerging markets where managers tend to retain cash to hedge against uncertainty, preserve financial flexibility, or compensate for limited access to external capital (Han & Qiu, 2007; Al-Najjar & Belghitar, 2011). This interpretation aligns with liquidity preference theory and supports arguments that firms may accumulate cash for precautionary or transactional motives rather than distribute it as dividends, especially under volatile market conditions (Keynes, 1964).

H2 : Debt negatively affects dividend payout. The regression results shown in Table 5 reveal that debt has no statistically significant relationship with dividend payouts (β = -0.35,

p = 0.228). Although the coefficient is negative, the effect is too weak to suggest that higher leverage meaningfully influences a firm's decision to reduce dividend payouts. This indicates that, within the baseline model, debt does not independently affect dividend payouts, and therefore H2 is not supported. The lack of a significant relationship aligns with the view that dividend decisions are shaped by multiple interacting factors rather than leverage alone. While agency theory and the free cash flow hypothesis argue that higher debt should constrain dividend payouts due to increased financial obligations (Jensen, 1986), the empirical results suggest that this mechanism does not operate strongly in the context of the sampled firms. One possible explanation is that companies may prioritize maintaining stable dividends to avoid negative market reactions, even when leverage is high. Additionally, firms in emerging markets often rely on internal financing and may manage liquidity in ways that reduce the direct impact of debt on payout decisions (Alsultan & Hussainey, 2023).

H3. Firm size positively affects dividend payouts. The regression results shown in Table 5 indicate that firm size has a positive but statistically insignificant effect on dividend payouts ($\beta = 0.08$, p = 0.096). Although the coefficient suggests that larger firms tend to distribute higher dividends, the effect is not strong enough to confirm a meaningful relationship. Therefore, H3 is not supported in the baseline model. The lack of statistical significance implies that firm size alone does not determine dividend decisions among Thai-listed firms. This contrasts with traditional expectations that larger firms, owing to stronger reputations, better access to external financing, and lower information asymmetry, are more likely to maintain stable dividend policies (La Porta et al., 2000)

H4. Debt and firm size jointly moderate the relationship between cash holdings and dividend payouts. To evaluate the moderating hypothesis (H4), a three-way interaction model (PROCESS Model 3) was employed. Following Hayes (2022), both interaction effects and conditional effects must be examined to establish the presence of moderated moderation. The results show that the three-way interaction term between cash holdings, debt, and firm size is positive and statistically significant ($\beta = 6.00$, p = 0.006, LLCI = 1.70, ULCI = 10.30), indicating that the influence of cash holdings on dividend payouts is jointly conditioned by leverage and organizational scale. This confirms that debt and firm size do not merely exert independent moderating effects; instead, their combined influence fundamentally shapes how firms convert cash reserves into dividend payouts. The overall moderated moderation model was also statistically significant ($R^2 = 0.25$, $\Delta R^2 = 0.02$, F = 31.54, p < 0.001), supporting H4.

The conditional effects presented in Table 6 further illustrate how the direction and magnitude of the cash-dividend relationship vary across different combinations of debt and firm size. When firms have low debt and small size, cash holdings significantly increase dividend payouts, suggesting that smaller firms with low leverage rely more heavily on liquidity to maintain payouts. In contrast, large firms with low debt exhibit a significant negative relationship between cash holdings and dividends, indicating that these firms may retain cash for investment, strategic expansion, or risk management, despite having abundant liquidity. Under high debt conditions, the effect of cash holdings on dividend payout becomes weak or statistically insignificant across all size categories, implying that financial obligations and liquidity pressures override firms' willingness or ability to distribute dividends.

Collectively, these results indicate that dividend behavior cannot be understood through liquidity alone. Instead, payout decisions depend on the interplay between cash availability, financial leverage, and firm size-each shaping the firm's financial flexibility, monitoring intensity, risk exposure, and governance environment. The significant three-way interaction underscores the importance of examining joint moderating effects to capture the complex mechanisms that govern dividend policy in emerging markets.

Table 6. Moderation Analyses: Conditional Effects

| Level of DEBT	Level of SIZE	Effect	*SE*	*t*	*p-value*	LLCI	ULCI
Conditional effect of cash holding on dividend at levels of the moderator (debt and firm size): H4							
Low - DEBT	Small - SIZE	2.28	0.99	2.30	0.021**	0.34	4.22
	Medium - SIZE	-1.72	0.99	-1.73	0.083	-3.67	0.23
	Large - SIZE	-5.72	1.79	-3.20	0.001***	-9.24	-2.21
Average - DEBT	Small - SIZE	1.55	0.97	1.60	0.110	-0.35	3.45
	Medium - SIZE	-0.43	0.72	-0.59	0.553	-1.84	0.99
	Large - SIZE	-2.40	1.09	-2.20	0.028**	-4.54	-0.27
High - DEBT	Small - SIZE	0.82	1.64	0.50	0.619	-2.40	4.04
	Medium - SIZE	0.87	1.05	0.83	0.409	-1.19	2.93
	Large - SIZE	0.92	1.29	0.71	0.476	-1.61	3.45

Note(s): N = 2,375. Unstandardized regression coefficients are reported. LLCI refers to the lower-level confidence interval and ULCI refers to the upper-level confidence interval. In this table, the categories low, average, and high, are used in place of the values –1 SD, the mean, and +1 SD of DEBT, respectively. Similarly, the categories small, medium, and large, are used in place of the values –1 SD, the mean, and +1 SD of SIZE, respectively.
 , and * *Denote significance at the 0.05, and 0.01 levels, respectively.*
Source(s): Created by authors.

Subsequently, conditional effects were examined to check under which conditions moderation was significant. The values of the conditional effects show that low levels of debt and firm size have a positive relationship between cash holdings and dividend payouts, while low and average levels of debt and high firm size have a negative relationship between cash holdings and dividend payout (Table 6). The simple slope analysis (Figure 2) was also conducted using Model 3 in PROCESS (Hayes, 2022).

Figure 2. Three-way Interactions among Cash Holdings, Debt, and Firm Size, on Dividend Payouts.
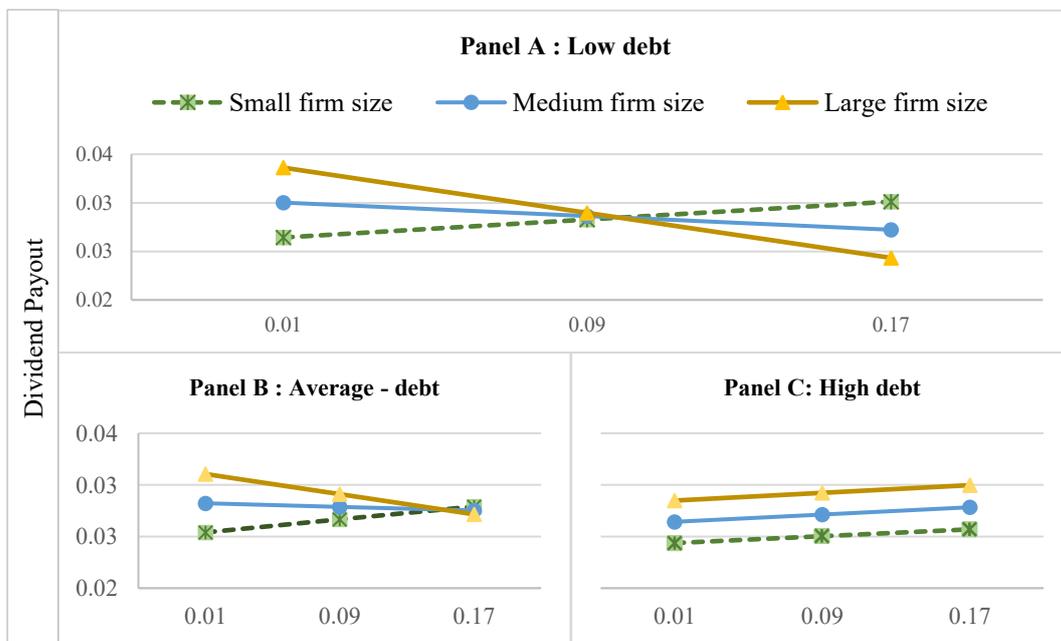
Note(s): Low debt < 0.21; Average debt 0.21–0.43; High debt > 0.43.
Source(s): Created by authors.

Figure 2 illustrates that the effect of cash holdings on dividend payouts varies substantially across different combinations of debt and firm size. For small firms (total assets ≤ 1,533 million baht) with low leverage (debt-to-assets ratio < 0.21), cash holdings significantly increase dividend payouts, indicating a positive and meaningful relationship. This pattern is consistent with the practical behavior of small firms, which often relies on dividend payout to signal financial strength and maintain investor confidence due to their limited visibility in the capital market.

In contrast, for large firms (total assets ≥ 35,312 million baht) with below-average debt levels (debt-to-assets ratio ≤ 0.43), higher cash holdings were associated with significantly lower dividend payouts. A stronger practical justification for this pattern is that large firms typically have more diversified investment opportunities, ongoing strategic projects, and long-term expansion plans. With low debt pressure, these firms may prioritize liquidity retention to fund future acquisitions, digital transformation, or internationalization rather than distributing cash immediately to shareholders. Additionally, large firms often have stable access to external financing, meaning they do not need to use dividends as a primary tool to signal credibility, unlike smaller firms. This reduces the incentive to convert excess cash into dividend payouts.

Among highly leveraged firms (debt-to-assets ratio > 0.43), the relationship between cash holdings and dividend payouts is positive but statistically insignificant, implying that debt pressure may constrain dividend capacity regardless of liquidity levels. In practice, firms with high leverage are likely to prioritize debt servicing, compliance with loan covenants, and liquidity buffers to avoid refinancing risk. These obligations diminish the role that cash reserves can play in influencing payout decisions. Collectively, the patterns in Figure 2 underscore the finding that dividend policy is shaped not only by cash availability but also by practical considerations related to financial flexibility, capital investment priorities, debt constraints, and signaling incentives. Thus, the significant three-way interaction reflects meaningful differences in payout behavior across firm types.

4.4 Additional Testing

To validate the robustness of the main findings derived from the moderated moderation model (Hayes PROCESS Model 3), an additional test was performed using a logistic regression model. In this approach, the dependent variable was transformed into a binary indicator (dividend payout dummy), taking the value of 1 if the firm paid a dividend and 0 otherwise. This method follows prior empirical studies such as Boshnak (2023), Mai et al., (2023) and Farooq et al., (2024), which argued that logistic models are appropriate when the dependent variable is dichotomous.

Table 7. Additional Test (Logistic Regression Model)

Variable	Pay dividends (Dummy)			
	Fixed effects logistic regression model			
	Coef	SE	z	p-value
constant	1.12	0.37	3.00	0.003
CASH	0.69	0.66	1.04	0.298
DEBT	-0.28	0.26	-1.08	0.281
SIZE	0.05	0.04	1.15	0.250
CASH x DEBT	-7.00	3.10	-2.26	0.024**
CASH x SIZE	1.19	0.44	2.67	0.008***
DEBT x SIZE	-0.20	0.14	-1.41	0.159

CASH x DEBT x SIZE	1.41	2.01	0.70	0.482
BSIZ	0.03	0.02	1.42	0.154
BIND	-1.16	0.50	-2.32	0.070
INSO	0.01	0.00	1.87	0.062
FORO	-0.01	0.00	-2.84	0.004***
CFO	0.46	0.45	1.03	0.303
ROA	0.98	0.80	1.22	0.224
GRO	-0.04	0.24	-0.18	0.858
MTB	-0.07	0.03	-2.04	0.042**
Year/Industry dummy			*Included*	
Log likelihood			2838.62	
LR $\chi 2$			46.70	
Prob > $\chi 2$			0.000	
Pseudo R^2			0.277	

Note(s): N = 2,375. Unstandardized regression coefficients are reported.
***, *** Denote significance at the 0.05, and 0.01 levels, respectively.*
Source(s): Created by authors.

The model achieves a Pseudo R² of 0.277, suggesting that it has reasonable explanatory strength in capturing the determinants of dividend payment decisions. Beyond statistical verification, this additional test offers further insight into firms' payout behavior and provides an important cross-check of the primary findings. The results reveal that the core moderating mechanisms remain consistent. The interaction between cash holdings and debt is negative and statistically significant, indicating that as leverage increases, the probability of dividend payment declines even when the firm holds substantial cash reserves. Similarly, the interaction between cash holdings and firm size is positive and significant, showing that larger firms with greater liquidity tend to maintain or increase dividend payouts. These two-way interactions reinforce the conclusion that leverage and firm size continue to play meaningful roles in shaping payout decisions across different model specifications.

However, the three-way interaction between cash holdings, debt, and firm size became statistically insignificant in the logistic regression. This outcome is theoretically expected given the model's structure. Logistic regression simplifies the dependent variable into a dichotomous decision, thereby removing the continuous variation needed to detect more complex conditional relationships. As a result, the model is less sensitive to the subtle slope differences required to identify higher-order interactions. The loss of significance in the three-way term does not undermine the main findings; rather, it reflects an inherent limitation of binary outcome models in capturing nuanced moderated moderation effects. Overall, the logistic robustness test supports the validity of the primary results. The consistent significance of the two-way interactions confirms that leverage and organizational scale materially influence how cash holdings translate into dividend policy. The test therefore strengthens confidence in the study's conclusions and demonstrates that the observed moderating patterns are not artifacts of a single analytical approach.

Table 8 provides a summary of the hypotheses. The data indicate that the hypotheses related to the 3-way analyses are supported and demonstrate a strong association with dividend payouts.

Table 8. Summary of Hypothesis

Hypothesis	Variables code	Expected sign	Actual sign	Supported
H1. Cash holdings positively affect dividend payouts.	CASH	(+)	(-)	No
H2. Debt negatively affects dividend payouts.	DEBT	(-)	(-)	No
H3. Firm size positively affects dividend payouts.	SIZE	(+)	(-)	No
H4. Debt and firm size moderate the relationship between cash holdings and dividend payout.	3-way Interaction	(+)	(+)	Yes

Source(s): Created by authors.

5. CONCLUSION

This study examined the impact of cash holdings on dividend payouts while considering debt and firm size as moderating variables. By integrating leverage and firm scale into the cash dividend relationship, the study extends prior literature and provides empirical evidence from 475 non-financial firms listed in Thailand during the period 2019−2023. Using Hayes's moderated moderation framework, the analysis reveals that cash holdings, debt, and firm size, do not exert significant direct effects on dividend payouts. This finding challenges traditional arguments from liquidity preference, agency theory, and capital structure perspectives, which typically predict positive or negative linear relationships (Benavides et al., 2016; Jia & McMahon, 2019; Alsultan & Hussainey, 2023).

However, the significant three-way interaction provides a more nuanced theoretical contribution. It demonstrates that the effect of cash holdings on dividend payout depends jointly on a firm's leverage position and organizational scale. Specifically, small firms with low debt, exhibit higher dividend payouts, consistent with signaling theory and the view that financially constrained firms use dividends to convey stability. In contrast, large firms with below-average debt show reduced payouts despite holding substantial cash, aligning with agency and investment opportunity theories that suggest larger firms may retain liquidity for strategic expansion rather than distribute it. Meanwhile, under high-debt conditions, cash holdings do not influence payout behavior, indicating that leverage constraints dominate managerial discretion.

These findings offer practical implications for investors. Passive-income investors seeking consistently high dividends may consider small, low-debt firms, which tend to convert liquidity into payouts more readily. Growth-oriented investors, however, may prefer larger firms with moderate debt levels, where retained cash often supports future investment capacity. Caution is advised when investing in highly leveraged firms, as excessive debt may suppress dividend stability regardless of cash availability.

This study has several limitations. First, it does not address the regularity or stability of dividend payouts over time. Second, the five-year dataset does not capture long-term structural changes or sector-specific dynamics, including disruptions during the COVID-19 period. Third, the analysis does not differentiate types of debt or explore why some dividend-paying firms experience declining payout levels. Future research could incorporate longer time horizons, industry-specific effects, and detailed debt classifications to provide deeper insight into dividend behavior.

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