

INTERNAL FINANCIAL CAPACITY AND INVESTMENT INTENSITY: THE MODERATING ROLE OF CASH HOLDINGS

Gun Gun Budiarsyah^{1*}, Mutty Claudia Dewinda², Mandasari. R.³

^{1,2,3}Accounting, Faculty of Business, Universitas Universal
gungun.budiarsyah@uvers.ac.id¹, mutty.claudia@uvers.ac.id², mandasari@uvers.ac.id³

ABSTRACT

This study examines how profitability, leverage, liquidity, and firm size affect investment intensity, with particular emphasis on the moderating role of cash holdings. Using panel data from firms listed on the Indonesia Stock Exchange over 2000–2024, the analysis employs fixed-effects regression with robust standard errors. The results show that profitability and firm size are positively associated with investment intensity, whereas leverage and liquidity exert negative effects. More importantly, cash holdings significantly moderate these relationships by strengthening the positive effect of profitability and mitigating the negative effects of leverage and liquidity, highlighting the role of internal liquidity as a financial buffer. Additional analyses using asset tangibility and cash flow as alternative moderators confirm the robustness of the main findings. Asset tangibility provides the strongest and most consistent moderating effects, while cash flow offers supportive but more selective evidence. Overall, the findings suggest that investment intensity depends not only on firm fundamentals but also on firms' internal financial capacity.

Keywords: Investment Intensity, Cash Holdings, Tangibility, Corporate Finance

INTRODUCTION

Investment intensity is a strategic corporate decision because it reflects how firms allocate resources into productive assets that support long-term growth and future business prospects (Ani & Chavali, 2023). It also captures the extent of a firm's commitment to expanding productive capacity through fixed asset investment, making it appropriate to position investment intensity as the dependent variable in this study (Benetyte et al., 2021). In the broader literature, investment intensity is considered important not only for firm growth but also for long-term economic development, as current investment is expected to generate future benefits and revenues (Streimikis et al., 2024).

Among the internal factors that may shape investment intensity, profitability remains one of the most relevant explanatory variables. In this study, profitability is proxied by return on assets (ROA), which reflects the firm's ability to generate earnings from its asset base (Rađenović et al., 2023). However, prior studies show mixed results on the relationship between profitability and investment intensity, with EBITDA positively associated and EBIT negatively associated, indicating that different profitability measures lead to different investment implications (Ani & Chavali, 2023).

The literature further suggests that the relationship between profitability and investment

may be dynamic rather than purely contemporaneous. Dibiasi et al., (2018) and Genc, (2017) indicate that investment-related outcomes may unfold over time rather than immediately. Similarly, Susanto et al., (2024) shows that investment intensity is positively related to current earnings and continues to affect performance in subsequent periods, implying that the returns from investment may emerge gradually, also report a two-way positive effect between profit margin and investment in several regions, meaning that profitability may stimulate investment, while investment may also shape future profitability. Based on these arguments, the use of ROA in this study remains appropriate because it captures asset-use efficiency and internal financing capacity rather than a purely mechanical one-directional relationship (Benetyte et al., 2021; Kim & Kim, 2018; Rađenović et al., 2023).

Leverage (LEV) is another important determinant because a firm's capital structure influences the extent to which it can finance investment activities (Wu et al., 2024). Debt financing may provide external funding that enables firms to expand operations, modernize infrastructure, and improve efficiency (Saif-Alyousfi et al., 2025). At the same time, when leverage becomes too high, fixed interest obligations and debt pressure may increase financial distress, reduce financial flexibility, and



constrain a firm's ability to adjust under uncertainty (Serebriakova et al., 2026). Recent studies reinforce the view that investment decisions are shaped by financing constraints, business risk, and policy uncertainty (Zhou et al., 2025). Under uncertain conditions, highly leveraged firms tend to delay, reduce, or even cancel investment projects because managers become more cautious in committing resources (Wei et al., 2026). Therefore, leverage in this study is treated not only as a measure of debt burden but also as a proxy for financial frictions that may either support or suppress investment intensity (Wei et al., 2026).

Liquidity (CUR) also remains relevant because it reflects the firm's ability to meet short-term obligations while maintaining operational flexibility (Wang & Li, 2026). Firms with stronger liquidity are generally less dependent on costly external finance and are therefore better positioned to respond to investment opportunities (Serebriakova et al., 2026). In this study, liquidity is proxied by the Working Capital Ratio (CUR), calculated as current assets minus current liabilities, scaled by total assets. This measure is appropriate because it captures the firm's net short-term financial flexibility relative to its asset base, which is directly relevant to investment decisions. Prior literature suggests that firms with adequate liquidity can execute projects more quickly and avoid unnecessary borrowing costs, thereby supporting the use of this alternative liquidity proxy in the model (Ani & Chavali, 2023).

Firm size is also expected to matter because larger firms generally possess stronger tangible and intangible resources, greater economies of scale, and easier access to financing (Wang & Li, 2026). In addition, Ani & Chavali, (2023) note that prior studies have found a positive relationship between firm size and investment in fixed assets. This suggests that firm size is not merely a descriptive characteristic, but a structural factor that may enable firms to realize higher investment intensity. Accordingly, size is retained in this study as a variable reflecting the firm's capacity to undertake and sustain productive investment (Kim & Kim, 2018).

Meanwhile, cash holdings (CASH) remain an important moderating variable because internal financing is often easier to access than external funds, especially for risky and long-term investment activities (Hu & Yang, 2022). Hu & Yang, (2022) further argue that outside investors are often reluctant to finance high-risk projects,

which makes firms more reliant on internal cash reserves as a funding source. They also show that cash holdings not only promote investment intensity but also support the continuity of investment activities. Empirically, Hu & Yang, (2022) find that internal control quality is positively associated with cash-holding levels, and that cash-holding levels are positively associated with investment intensity. This evidence supports the inclusion of cash holdings as a moderating variable because internal cash may provide a relatively stable funding buffer when external finance is constrained. At the same time, the literature also warns that excessive cash may be misused in nonproductive or inefficient investment, meaning that the role of cash is not automatically beneficial in every context (Hu & Yang, 2022).

Overall, investment intensity can be understood as the outcome of the interaction between profitability, debt structure, liquidity, firm size, and internal cash availability (Cenci & Tang, 2024). Against this background, this study is important because it not only examines the direct effects of ROA, LEV, CUR, and SIZE on investment intensity, but also tests whether cash holdings strengthen or weaken these relationships (Hu & Yang, (2022)). By doing so, the study is expected to provide a more comprehensive explanation of the factors shaping corporate investment intensity (Sofiamanan et al., 2023). This study contributes to the Indonesian corporate finance literature by examining the moderating role of cash holdings in the relationship between multiple firm-level financial characteristics and investment intensity within a single empirical framework. Moreover, the 2000–2024 observation period, covering 25 fiscal years and various economic cycles, enables the study to provide more comprehensive longitudinal evidence than prior Indonesian studies with relatively shorter observation periods.

LITERATURE REVIEW

Agency Theory

Agency theory explains the firm as a contractual arrangement between the principal, who provides capital and expects value maximization, and the agent, who is delegated authority to manage the firm and make strategic (Jensen & Meckling, 1976). Because managers generally possess more firm-specific information than shareholders, agency relationships often generate information asymmetry and conflicts of interest, particularly when managerial objectives



differ from owners' wealth-maximization goals. As a result, investment decisions may not fully reflect purely economic considerations, but may also incorporate managerial preferences, incentives, and risk attitudes.

Investment intensity is ultimately determined by managerial decisions regarding the use of corporate resources. Managers may allocate resources aggressively when they pursue growth, market reputation, or private benefits, but they may also adopt more cautious investment policies when they are concerned about financial pressure, uncertainty, or their own job security. Therefore, agency theory provides an appropriate lens for understanding why internal financial conditions—such as profitability, leverage, liquidity, firm size, and cash holdings—may shape investment intensity differently across firms.

Investment Intensity

Investment intensity reflects the extent to which a firm commits its resources to productive asset expansion in support of long-term growth. Firms with high investment intensity devote a relatively larger portion of their resources to capital expenditure, indicating a stronger commitment to operational capacity building and future business development (Ani & Chavali, 2023). From the perspective of agency theory, investment intensity also reflects managerial judgment. Managers may increase investment to expand firm scale, strengthen competitive position, and signal growth prospects to the market. However, such decisions are not always fully aligned with shareholder interests, particularly when managers pursue personal objectives or react excessively to financing constraints and uncertainty.

Direct Effects on Investment Intensity

Profitability, Leverage, and Investment Intensity

Profitability reflects a firm's ability to generate earnings from the assets and resources it controls. ROA captures how effectively total assets are converted into consolidated net income where firms with higher profitability generally have stronger internal financing capacity, making it easier to fund capital expenditure without relying heavily on external financing (Ani & Chavali, 2023; Rađenović et al., 2023). From an agency theory perspective, higher ROA increases managerial discretion over internal funds, which, when aligned with shareholder interests, can support productive investment and enhance future firm value. Although prior studies report mixed

evidence on the profitability–investment relationship, this study expects a positive association because ROA primarily reflects internal funding capacity and asset-use efficiency, both of which are expected to support investment intensity (Ani & Chavali, 2023; Susanto et al., 2024).

By contrast, leverage reflects the extent to which firm assets are financed through liabilities. While debt can provide additional funds for expansion and productive investment, it also creates fixed obligations in the form of interest and principal payments. As a result, leverage may affect investment decisions by increasing financing capacity while simultaneously intensifying financial pressure (Saif-Alyousfi et al., 2025). Agency theory suggests that leverage plays a dual role: it may discipline managers by reducing free cash flow, but excessive leverage can also reduce financial flexibility and lead managers to delay or scale down investment, particularly under uncertain conditions. Recent evidence further suggests that highly leveraged firms tend to become more cautious in undertaking investment projects when financial obligations increase (Wei et al., 2026).

H1: Profitability has a significant positive effect on investment intensity.

H2: Leverage has a significant negative effect on investment intensity.

Liquidity, Firm Size, and Investment Intensity

Liquidity is proxied by the Working Capital Ratio (CUR), which reflects a firm's net short-term financial flexibility relative to its asset base and is therefore relevant to investment decisions. Firms with stronger liquidity are generally less reliant on costly external financing and are better able to respond to profitable investment opportunities. From an agency theory perspective, adequate liquidity can reduce financing frictions and allow managers to implement projects more efficiently because internal short-term resources are readily available. Although excessive liquidity may also give rise to agency problems when funds are held idle or used inefficiently, liquidity is generally expected to support investment by enhancing financial flexibility.

Firm size (SIZE), by contrast, reflects the scale of corporate operations and is commonly associated with broader access to financing, stronger resource bases, and greater operational capacity. Larger firms tend to benefit from economies of scale, stronger market positions, and



lower perceived financing risk, all of which can support higher levels of investment activity (Benetyte et al., 2021; Saif-Alyousfi et al., 2025). From the viewpoint of agency theory, although larger firms may face greater complexity and information asymmetry, they also tend to have more formal governance structures, stronger monitoring systems, and more diversified sources of capital. In practical terms, this means that larger firms are more likely to sustain investment because managers in those firms control broader organizational and financial resources.

H3: Liquidity has a significant positive effect on investment intensity.

H4: Firm size has a significant positive effect on investment intensity.

Moderating Effects of Cash Holdings and Investment Intensity

Cash holdings (CASH) refer to the cash and cash-equivalent resources maintained by firms to support operations, cope with uncertainty, and finance strategic decisions. Prior literature suggests that internal cash is easier to access than external funds, particularly for high-risk and long-term activities, because outside investors may face information asymmetry and underestimate the value of future projects (Hu & Yang, 2022). As a result, firms with higher cash holdings tend to enjoy more stable internal support for investment activities.

Cash holdings are expected to moderate the effects of core financial conditions on investment intensity, particularly profitability and leverage. First, cash holdings may strengthen the positive effect of profitability on investment intensity because profitable firms with ample internal cash are in a better position to convert earnings into actual capital expenditure. When cash availability is high, managers rely less on external finance and face fewer funding constraints when pursuing productive projects. Second, cash holdings may weaken the negative effect of leverage on investment intensity because internal cash can reduce the financing pressures associated with debt. Firms with sufficient cash reserves are less vulnerable to short-term shocks and are less dependent on additional borrowing, allowing managers to continue investment even when leverage is relatively high. In this sense, cash holdings function as a financial buffer that supports investment by enhancing the investment-converting role of profitability and mitigating the investment-constraining role of leverage.

H5: Cash holdings positively moderate the effect

of profitability on investment intensity.

H6: Cash holdings weaken the negative effect of leverage on investment intensity.

Cash holdings are also expected to moderate the effects of broader firm capacity on investment intensity, particularly liquidity and firm size. Liquidity and cash holdings are closely related but conceptually distinct. Liquidity, as measured by the working capital ratio, captures the firm's short-term financial position, whereas cash holdings represent immediately deployable internal reserves. Firms with both strong working capital positions and high cash reserves are likely to be better able to maintain investment continuity under uncertainty (Hu & Yang, 2022). Managers in highly liquid firms may still hesitate to invest if actual cash resources are limited or already committed. By contrast, when cash holdings are also high, the positive effect of liquidity becomes stronger because operational flexibility is backed by real internal funds.

Similarly, larger firms generally have stronger access to financing and greater capacity to accumulate internal resources, including cash. Prior empirical evidence shows that firm size, debt ratio, profitability, and cash ratio are all relevant in explaining the intensity of innovation-related investment, indicating that cash availability forms part of the financial channel through which firm characteristics influence investment behavior (Benetyte et al., 2021). In agency theory, firm size provides managers with broader structural capacity, but the realization of that capacity into actual investment depends partly on available liquid funds. Cash holdings can therefore serve as an enabling condition that allows large firms to translate their size advantage into higher investment intensity. Accordingly, this study expects cash holdings to strengthen the positive effects of liquidity and firm size on investment intensity.

H7: Cash holdings positively moderate the effect of liquidity on investment intensity.

H8: Cash holdings positively moderate the effect of firm size on investment intensity.

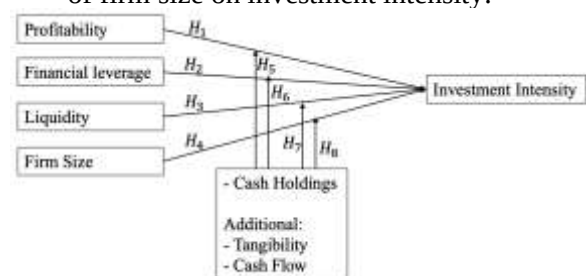


Figure 1. Conceptual Framework

RESEARCH METHOD

This study uses annual firm-level data for companies listed on the Indonesia Stock Exchange (IDX) over the period 2000–2024. The data are obtained from firms' published annual financial statements and relevant capital market databases that provide the accounting information required to construct all variables used in this study. The sample is selected using purposive sampling. A firm is included in the sample only if it is listed on the IDX during the observation period, publishes annual financial statements accessible to the researcher, and provides sufficient data to construct the variables employed in the analysis. Observations are excluded only when the required data are missing, undisclosed, or economically invalid for ratio construction. Because not all firms have complete observations for every year, the final dataset is an unbalanced panel. The empirical analysis employs panel data regression because the dataset combines both cross-sectional and time-series dimensions, allowing the analysis to account for firm-level heterogeneity while capturing variation over time. The analysis begins with descriptive statistics to provide an overview of the characteristics of the variables, followed by regression analysis to examine the effects of profitability, leverage, liquidity, and firm size on investment intensity, as well as the moderating role of cash holdings. To improve the reliability of the estimation results, the regression is estimated using robust standard errors to address potential heteroskedasticity in the data.

Model specification

To examine the direct effects of profitability, leverage, liquidity, and firm size on investment

intensity, this study estimates the following baseline model 1:

$$INV_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 LEV_{it} + \beta_3 CUR_{it} + \beta_4 SIZE_{it} + \varepsilon_{it}.$$

where INV_{it} represents the investment intensity of firm i in year t , measured as capital expenditure divided by total assets. ROA_{it} denotes profitability, measured as consolidated net income divided by total assets. $LEVE_{it}$ denotes financial leverage, measured as total liabilities divided by total assets. CUR_{it} denotes liquidity, measured as net working capital, defined as current assets minus current liabilities, divided by total assets. $SIZE_{it}$ denotes firm size, measured as the natural logarithm of sales. ε_{it} is the error term.

To test the moderating role of cash holdings, the baseline model 2 is extended by incorporating cash holdings and the interaction terms between cash holdings and each explanatory variable:

$$\begin{aligned} INV_{it} &= \beta_0 + \beta_1 ROA_{it} + \beta_2 LEVE_{it} + \beta_3 CUR_{it} \\ &+ \beta_4 SIZE_{it} + \beta_5 (ROA \times CASH)_{it} \\ &+ \beta_6 (LEVE \times CASH)_{it} + \beta_7 (CUR \times CASH)_{it} \\ &+ \beta_8 (SIZE \times CASH)_{it} + \varepsilon_{it}. \end{aligned}$$

In this extended specification, $CASH_{it}$ represents cash holdings, measured as cash and short-term investments divided by total assets. The interaction terms are included to assess whether cash holdings strengthen or weaken the relationships between profitability, leverage, liquidity, firm size, and investment intensity. A significant interaction coefficient indicates that the effect of the corresponding explanatory variable on investment intensity depends on the level of cash holdings.

Table 1. Variable Description

Variable	Code	Formula	Description
Investment intensity	INV	$\frac{\text{Capital Expenditure}}{\text{Total Assets}}$	Measures capital expenditure scaled by total assets.
Return on assets	ROA	$\frac{\text{Net Income}}{\text{Total Assets}}$	Measures consolidated net income scaled by total assets.
Financial leverage	LEV	$\frac{\text{Total Liabilitas}}{\text{Total Assets}}$	Measures total liabilities scaled by total assets.
Working capital ratio	CUR	$\frac{\text{Current Assets} - \text{Current Liabilities}}{\text{Total Assets}}$	Measures net working capital scaled by total assets.
Firm size	SIZE	$\ln(\text{sale})$	Measures the natural logarithm of sales.
Cash holdings	CASH	$\frac{\text{Cash and Short} - \text{Term Investments}}{\text{Total Assets}}$	Measures cash and short-term investments scaled by total assets.



RESULTS AND DISCUSSION

Descriptive statistics

Table 2 presents the descriptive statistics for all variables used in this study. First, the average INV of firms in the sample is 0.0575, indicating that, on average, firms allocate approximately 5.75 percent of their total assets to capital expenditure. The minimum value of INV, 0.0001, indicates that some firms have very low levels of investment, while the maximum value of 0.3781 suggests that some firms exhibit relatively high investment intensity. The standard deviation of

0.0702 further indicates considerable variation in investment intensity across firms in the sample. Next, ROA shows an average profitability of 0.0182, or approximately 1.82 percent, suggesting that, in general, firms in the sample have relatively low profitability. However, the minimum ROA value of -0.6238 indicates that some firms experienced substantial losses, while the maximum value of 0.3636 shows that some firms achieved relatively strong profitability. The standard deviation of 0.1199 indicates substantial variation in profitability across firms.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
INV	10,283	0.0575403	0.0702121	0.0000616	0.3781115
ROA	12,376	0.0181974	0.1198567	-0.6237845	0.3636214
LEV	14,375	0.5680834	0.3961512	0.0170635	2.758669
CUR	10,841	0.0994897	0.3978827	-2.08553	0.8132778
SIZE	10,736	12.30205	3.335982	2.747399	17.74758
CASH	10,845	0.1117015	0.1251348	0.0004924	0.6134068

The LEV variable has an average value of 0.5681, indicating that, on average, approximately 56.81 percent of firm assets are financed by liabilities. The minimum value of 0.0171 suggests that some firms have very low levels of debt, whereas the maximum value of 2.7587 indicates that some firms are highly leveraged. This finding suggests that the financing structures of firms in the sample are highly diverse, ranging from relatively conservative to highly aggressive. For CUR the average value is 0.0995. This suggests that, in general, firms maintain positive net working capital relative to total assets. However, the minimum value of -2.0855 indicates that some firms face serious short-term liquidity pressure, while the maximum value of 0.8133 suggests that some firms are in relatively strong liquidity positions. The standard deviation of 0.3979 confirms substantial variation in liquidity across firms.

Furthermore, SIZE has an average value of 12.3021, with a minimum of 2.7474 and a maximum of 17.7476. This indicates that the sample consists of firms of widely varying sizes, ranging from relatively small to very large firms. The standard deviation of 3.3360 further confirms the broad variation in firm size across the sample. Meanwhile, CASH has an average value of 0.1117, meaning that firms hold cash and short-term investments equivalent to approximately 11.17 percent of total assets. The minimum value of 0.0005 indicates that some firms maintain very limited cash reserves, while the maximum value

of 0.6134 shows that some firms hold relatively high levels of cash. The standard deviation of 0.1251 indicates that cash-holding policies also vary considerably across firms.

Panel Regression Results

Model 1 INV reports the direct effects of the independent variables on investment intensity, while Model 2 INV includes interaction terms between cash holdings and each independent variable. The estimation results show that profitability has a positive and significant effect on investment intensity in both models with the coefficient 0.0669 in Model 1 and 0.0800 in Model 2, both significant at the 1 percent level. This indicates that the greater a firm's ability to generate profits from its assets, the greater its tendency to invest. This finding is consistent with the view that profitability reflects stronger internal financing capacity, enabling more profitable firms to finance capital expenditures without relying excessively on external funding (Ani & Chavali, 2023; Benetyte et al., 2021; Rađenović et al., 2023).

The leverage shows a negative and significant effect in both models. The coefficients are -0.0188 in Model 1 and -0.0202 in Model 2, both significant at the 1 percent level. This indicates that higher debt levels are associated with lower investment intensity. This finding indicates that higher debt levels are associated with lower investment intensity, as debt obligations constrain firms' financial flexibility in



allocating resources for investment, leading highly leveraged firms to adopt more cautious investment decisions due to fixed payment commitments and elevated financial risk (Saif-Alyousfi et al., 2025; Serebriakova et al., 2026; Wei et al., 2026).

Furthermore, liquidity also shows a negative and significant effect in both models. The coefficient of CUR is -0.0162 in Model 1 and -0.0152 in Model 2. This indicates that higher liquidity does not necessarily lead to increased investment. Instead, firms with relatively higher net working capital tend to retain resources to support short-term operational needs rather than allocating them to fixed-asset investment. Thus, in this study, liquidity appears to function more as an operational buffer than as a driver of investment expansion (Ani & Chavali, 2023; Wang & Li, 2026).

The firm size shows a positive and significant effect in both models. The coefficients of 0.0016 in Model 1 and 0.0019 in Model 2 indicate that larger firms tend to exhibit higher investment intensity. This finding supports the view that large firms generally possess greater resources, broader access to financing, and stronger operational capacity to undertake long-term investments (Benetyte et al., 2021; Kim & Kim, 2018; Saif-Alyousfi et al., 2025).

Meanwhile, cash holdings produce different results across the two models. In Model 1, cash holdings have a negative and significant effect on investment intensity, with a coefficient of -0.0364. This suggests that firms with higher cash levels tend to retain these funds as liquidity reserves rather than immediately allocating them to investment. However, after the interaction terms are introduced in Model 2, the direct effect of cash holdings becomes insignificant. This indicates that, after accounting for moderation effects, cash holdings no longer have a strong direct impact on investment intensity. This finding suggests that internal cash serves not only as a source of investment financing but also as a financial buffer against uncertainty (Hu & Yang, 2022).

The interaction results in Model 2 show that only ROA_CASH is statistically significant, with a coefficient of -0.1252 at the 1 percent level. This indicates that cash holdings negatively moderate the relationship between profitability and investment intensity. In other words, although profitability encourages firms to increase investment, this positive effect becomes weaker when firms hold higher levels of cash. This

finding suggests that highly liquid firms do not always immediately convert profitability into capital expenditures, but may instead choose to retain cash as a precautionary buffer. This result is consistent with the literature suggesting that cash holdings may either support or restrain investment realization, depending on managerial preferences and firms' financial conditions (Cenci & Tang, 2024; Hu & Yang, 2022).

In contrast, the interaction terms LEV_CASH, CUR_CASH, and SIZE_CASH are not statistically significant. This indicates that cash holdings do not moderate the relationships between leverage, liquidity, and firm size and investment intensity. Thus, the moderating role of cash holdings in this study is supported only for the relationship between profitability and investment intensity, while the other moderating relationships receive no empirical support. The insignificant interaction effects of cash holdings on the relationships between leverage, liquidity, firm size, and investment intensity do not necessarily indicate that firms' internal financial capacity is irrelevant. Instead, these findings suggest that different forms of financial capacity perform different functions in supporting investment. From an agency theory perspective, cash holdings are highly liquid and remain largely under managerial discretion. Consequently, managers may retain cash for precautionary purposes, operational flexibility, or private preferences rather than immediately allocating it to fixed-asset investment. This discretionary characteristic may explain why cash holdings do not consistently moderate the effects of leverage, liquidity, and firm size on investment intensity.

In contrast, tangible assets represent relatively committed and observable resources that can be used as collateral, reduce information asymmetry, and improve firms' access to external financing. Accordingly, the significant interaction effects involving asset tangibility in Table 4 indicate that tangible assets provide a more direct and credible financial foundation for translating firm characteristics into investment expenditure. Cash flow also represents internally generated funding that is directly linked to firms' ongoing operating performance, although its moderating effects remain more selective. These differences indicate that the moderating role of internal financial capacity depends not only on the amount of available resources but also on their liquidity, commitment, observability, and susceptibility to managerial discretion.



Table 3. Panel Regression Results

VARIABLES	INV	INV
	Model 1	Model 2
ROA	0,0669*** (6,74)	0,0800*** (6,37)
LEV	-0,0188*** (-3,47)	-0,0202*** (-3,49)
CUR	-0,0162*** (-3,08)	-0,0152*** (-2,71)
SIZE	0,0016** (2,29)	0,0019** (2,48)
CASH	-0,0364*** (-3,78)	0,0201 (0,49)
ROA_CASH		-0,1252*** (-2,61)
LEV_CASH		0,0073 (0,27)
CUR_CASH		-0,0344 (-1,16)
SIZE_CASH		-0,0032 (-1,16)
Constant	0,0488*** (5,22)	0,0451*** (4,56)
Observations	8,927	8,927
R-squared	0,025	0,028

Robust t-statistics in parentheses

*** p<0,01, ** p<0,05, * p<0,1

Source: Research Data, 2026

Additional Analysis

We argue that cash holdings may not be the only channel through which firms' financial conditions shape investment intensity. Firms may also differ in their ability to translate profitability, leverage, liquidity, and firm size into investment depending on their asset structure and internal cash-generating capacity. To examine this possibility, we replace cash holdings with asset tangibility and cash flow as alternative moderating variables.

Asset tangibility may ease investment constraints because firms with more tangible assets are generally better able to obtain financing and commit resources to long-term investment. The results in Table 4 show that the interaction terms between tangibility and independent variable are positive and statistically significant. These findings suggest that firms with greater tangible asset support are better able to convert internal performance and financial capacity into capital expenditure, which is consistent with our main finding.

Table 4.

Additional Analysis Using Asset Tangibility and Cash Flow as Alternative Moderating Variables

VARIABLES	TANG Model 1	TANG Model 2	CF Model 1	CF Model 2
ROA	0.0698*** (6.81)	0.0530*** (5.11)	0.0642*** (6.63)	0.0639*** (6.66)
LEV	-0.0128** (-2.36)	-0.0115** (-2.13)	-0.0213*** (-3.94)	-0.0231*** (-4.30)
CUR	-0.0065 (-1.35)	-0.0094** (-1.98)	-0.0213*** (-4.08)	-0.0221*** (-4.27)
SIZE	0.0018*** (2.64)	-0.0015 (-1.35)	0.0016** (2.34)	0.0015** (2.21)
TANG	0.0737*** (8.24)	-0.0087 (-0.29)		
CF			0.0035	-0.0152



			(0.41)	(-0.54)
ROA_TANG		0.0362*** (3.28)		
LEV_TANG		0.0008** (2.07)		
CUR_TANG		0.0069** (2.09)		
SIZE_TANG		0.0070*** (3.01)		
ROA_CF				0.0107** (2.45)
LEV_CF				0.0001*** (4.09)
CUR_CF				-0.0007* (-1.72)
SIZE_CF				0.0018 (0.82)
Constant	0.0088 (0.90)	0.0476*** (3.28)	0.0461*** (4.96)	0.0481*** (5.22)
Observations	8,927	8,927	8,927	8,927
R-squared	0.0466	0.0554	0.0223	0.0249

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Research data, processed

We further examine cash flow as an alternative moderating variable. Internal cash flow may ease financing frictions because firms with stronger operating cash generation are less dependent on external financing and are therefore better able to sustain investment activity. We expect cash flow to strengthen the relationship between firm characteristics and investment intensity. The results show that the interaction between cash flow and profitability is positive and significant, and the interaction between cash flow and leverage is also positive and significant. These findings indicate that internally generated funds strengthen the extent to which profitability supports investment and mitigate the constraining effect of leverage on investment intensity. However, we do not find equally strong evidence for the interaction terms involving liquidity and firm size, suggesting that the moderating role of cash flow is more relevant to the profitability and leverage channels than to other firm characteristics.

Overall, the additional analyses reinforce our main conclusion that the relationship between firm fundamentals and investment intensity depends on firms' internal capacity and financial structure. Although cash holdings remain the main moderating variable in this study, the evidence from asset tangibility and cash flow suggests that investment intensity is also shaped by the extent to which firms possess tangible assets and

internally generated funds. Among the two alternative moderators, tangibility provides the strongest and most consistent evidence, whereas cash flow provides supportive but more selective evidence. Taken together, these results confirm the robustness of our main findings. The additional analysis also helps explain why H6, H7, and H8 are not supported when cash holdings are used as the moderator. Unlike cash holdings, asset tangibility is less easily redirected for short-term managerial purposes and can strengthen borrowing capacity through its collateral value. Therefore, tangibility provides stronger and more consistent moderating effects on the relationships between leverage, liquidity, firm size, and investment intensity. The evidence suggests that physical and committed resources may be more effective than liquid cash reserves in supporting long-term investment decisions.

CONCLUSIONS AND SUGGESTIONS

Conclusions

This study finds that profitability and firm size have positive and significant effects on investment intensity, whereas leverage and liquidity have negative and significant effects. These findings indicate that firms with stronger earnings capacity and larger operational scale tend to invest more intensively, while higher debt burdens and greater allocations to net working capital may constrain fixed-asset investment.

Regarding the moderating role of cash



holdings, the results show that only the interaction between profitability and cash holdings is statistically significant. However, the interaction coefficient is negative, indicating that cash holdings weaken, rather than strengthen, the positive effect of profitability on investment intensity. Thus, highly profitable firms with greater cash reserves do not necessarily translate their earnings into higher capital expenditure. Instead, they may retain cash for precautionary, operational, or managerial purposes. Meanwhile, cash holdings do not significantly moderate the relationships between leverage, liquidity, firm size, and investment intensity.

The additional analyses show that different forms of internal financial capacity perform different functions. Asset tangibility provides the strongest and most consistent moderating effects, while cash flow offers more selective support, particularly for the profitability and leverage channels. Overall, the findings demonstrate that investment intensity depends not only on firms' financial characteristics but also on the form, commitment, and managerial discretion associated with their internal financial resources.

Limitations and Suggestions

For managers of firms listed on the Indonesia Stock Exchange, the findings suggest that maintaining excessively high cash holdings may create inefficiencies by limiting the extent to which profitability is converted into productive long-term investment. Consistent with agency theory, large discretionary cash reserves may encourage precautionary retention, managerial conservatism, or inefficient resource allocation rather than capital expansion. Therefore, managers should establish an optimal cash-holding policy that balances liquidity protection with the need to finance productive investment opportunities.

Managers should also distinguish between liquid reserves and resources that directly support investment capacity. Tangible assets can strengthen collateral value and improve access to external financing, while operating cash flow provides internally generated funds that can be allocated more directly to investment. Accordingly, firms should not rely solely on accumulated cash but should improve cash-flow generation, asset utilization, and investment appraisal mechanisms to ensure that available financial resources are translated into value-enhancing capital expenditure.

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