

The Effect of Working Capital and Profitability on Cash Holding in the Industrial Sector

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ABSTRACT

Cash holdings of manufacturing companies in Indonesia varied during 2020-2024 in line with changes in investment policies, funding structures, and operating cash flows. This condition reflects the challenges companies face in maintaining optimal liquidity levels. The aim here is to search for the Effect of net working capital, profitability, leverage, cash flow, capital expenditure, and firm size on cash holding. This research implements a quantitative technique by the analysis of data regression through the FEM. This sample contains 39 manufacturing institutions/companies that existed in ISE with a total of 195 observations during the 2020-2024 period. The results show that Net Working Capital, Leverage, Cash Flow, and Capital Expenditure have an effect on Cash Holding, while Profitability has a significant negative effect on Cash Holding. These findings have implications for company management in formulating cash policies that are in line with liquidity management and investment decisions.

Keywords: Cash Flow; Capital Expenditure; Net Working Capital; Profitability; Firm Size



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INTRODUCTION

An Important issue in contemporary corporate financial management concerns determining optimal cash-holding levels. Cash represents the most liquid asset and enables firms to maintain operational flexibility, reduce liquidity risk, and respond quickly to investment opportunities. The appropriate level of cash holdings may vary significantly depending on financing structure, industry characteristics, business cycle conditions, and overall financial performance (Al Barak, 2025). Therefore, understanding the determinants of corporate cash holdings remains highly relevant, particularly in emerging markets. Net working capital, profitability, leverage, cash flow, capital expenditure, and firm size are commonly examined determinants of corporate cash holdings. Net working capital (NWC) reflects the firm's short-term financial position, measured as the difference between current assets and current liabilities. Firms with higher NWC may rely on other liquid assets as substitutes for cash, thereby reducing the need to hold large cash balances (Agnestyanyingsih et

al., 2023). Nevertheless, effective working capital management may also influence firms' liquidity policies (Judijanto & Ambarwati, 2024), leading to mixed empirical findings across settings. Profitability is frequently associated with cash holding behavior under the pecking order theory, which suggests that firms prefer internal financing over external funding sources. Consequently, more profitable firms may accumulate higher cash reserves as retained earnings (Al Barak, 2025). Several empirical studies document a positive relationship between profitability and cash holdings (Tawfik et al., 2022; Ahmed & Tahir, 2024; Mariska et al., 2025). However, evidence from Indonesia indicates that profitability does not consistently lead to higher cash retention, as firms may allocate profits toward reinvestment or dividend distribution instead (Puteri et al., 2022). These inconsistent results suggest that the profitability-cash holding relationship remains context-dependent. Leverage represents firms' reliance on debt financing and reflects financial risk exposure. According to the precautionary motive, firms with higher leverage may hold more cash to reduce the likelihood of financial distress (Al Barak, 2025). In contrast, other studies find that highly leveraged firms tend to reduce cash holdings due to debt repayment obligations (Krisyanto, 2024). These divergences indicate that leverage may affect cash holding decisions differently depending on a firm's financial conditions.

Cash flow reflects a firm's internal liquidity generated from operating activities. Firms with stronger cash flows generally have greater capacity to maintain liquidity without depending on external financing (Wang, 2024). Effective cash flow management, therefore, plays an important role in supporting liquidity stability and operational sustainability (M, 2025). Capital Expenditure represents long-term investment decisions that directly affect firms' liquidity positions. Prior studies generally report that higher capital expenditure reduces cash holdings as resources are allocated toward fixed asset investment (Elyasiani & Movaghari, 2022; Agnesstyaningsih et al., 2023). Similarly, research in manufacturing firms shows that capital expenditure significantly influences variations in cash holdings (Ekadjaja et al., 2022). From a precautionary motive perspective, firms undertaking substantial capital expenditure may simultaneously retain cash to maintain financial flexibility, particularly in environments characterized by financing constraints. Firm size is commonly included as a control variable in cash holding studies. Larger firms typically have better access to capital markets, benefit from economies of scale, and face lower information asymmetry (Suwaidan, 2022). As a result, firm size may influence corporate liquidity decisions, although empirical findings remain inconclusive.

Previous empirical studies continue to report inconsistent results regarding the determinants of cash holdings, particularly profitability, leverage, firm size, and capital expenditure. Evidence from Saudi Arabia (Al Barak, 2025), multi-country emerging market data (Yilmaz, 2024), and MENA countries (Akhtar, 2025) suggests that cash holding behavior varies across institutional and economic environments. In the Indonesian context, prior studies indicate that corporate financial behavior is shaped by firm-specific strategies and broader performance considerations, highlighting the heterogeneity of financial decision-making in emerging markets (Yulianti et al., 2025). Moreover, empirical evidence using post-pandemic data in the Indonesian manufacturing sector remains limited. Accordingly, this study examines the determinants of corporate cash holdings in Indonesian manufacturing firms during the 2020-2024 period. This research contributes by providing contextual empirical evidence on cash holding behavior during the post-pandemic period. Rather than proposing a new theoretical framework, this study clarifies how established financial theories such as trade-off theory, pecking order theory, and precautionary motives operate within the Indonesian manufacturing context, with particular attention to the role of capital expenditure in firms' liquidity management decisions.

METHODS

This study is categorized as quantitative research and focuses on analyzing the relationship between the variables studied. The research design uses hypotheses from the independent variables (NWC, profitability, and more). Here, firm size is implemented as a control variable for the dependent variable of cash holding. The entire population of industrial sector stocks on the IDX during the study period became a research sample. Sample selection was purposive, with the criteria from the study objectives. This report focuses on companies that have been tracked continuously from 2020 to 2024 and have published complete annual financial reports with all the data necessary for the development of research variables. Samples were taken from companies that met these criteria, so all analyses were conducted only on companies that used data collected over five years. The author used a documentary method to collect data. This involved collecting secondary data from reports on the official IDX site (www.idx.co.id) and companies that were considered to meet the criteria. The data collected included various financial variables. To ensure consistency and facilitate the calculation of variables, all data was re-entered into a spreadsheet. This study found 65 manufacturing subsectors listed on the official website of the ISE. After careful selection and sampling, only 39 companies were considered suitable for analysis. There were 195 observations over five years in this study.

Several aspects of this study explain how it works. To determine the amount of cash a company has, we look at the total and equivalent of cash reported in the company's financial statement. Meanwhile, NWC is integrated based on the ratio of the current assets to the current liabilities. The actual test determines whether the measure of the financial debt proportion. Cash flow is the income deposited in the bank from the company's main activities. The company's capital investment is reflected in capital expenditure, and firm size is obtained from the sum of assets. All these indicators are obtained exclusively from unadjusted financial statement data. Data analysis implemented an array of longitudinal econometric contrivances that are deployed antecedent to adjudicating the interdependence among analytical constructs. A multiplicity of discriminative diagnostics is invoked in the curation of an estimative framework, encompassing the Chow criterion, the Hausman discriminant, the Lagrange Multiplier apparatus, and sundry ancillary probative mechanisms. These inferential ordeals demarcate the most apposite specification amid the pooled archetype, the fixed-effects configuration, and the stochastic-effects schema. The consecrated formulation is subsequently instrumentalized to scrutinize the covariational entanglements among the examined magnitudes, thereby facilitating a more perspicuous appraisal of the existence and salience of causal efficacy between each determinant and pecuniary retention. The entirety of this analytic enterprise is executed through specialized quantitative software expressly engineered for the manipulation and interrogation of panel-structured datasets.

RESULTS AND DISCUSSION

Chow Test

This is to specify the panel model among CEM and FEM. From there, in Cross-Section Chi-Square, a p-value of $0.0000 < 0,05$ was obtained, meaning that H_0 was rejected and the model selected was the Fixed Effect Model (FEM).

Table 1. Chow Test

<i>Cross Section Chisquare</i>	<i>d.f.</i>	<i>Prob.</i>
196.893322	38	0.0000

Source: E-views 9.0

Hausman Test

The Hausman test is performed if the selected Chow test results indicate that the FEM is performed to determine the most appropriate panel model between FEM and REM. Based on the Hausman test results presented in Table 2, a Cross-Section Random p-value of $0.0000 < 0.05$ was obtained, which means that H_a is accepted, so the selected one is the FEM one.

Table 2. Hausman Test

<i>Cross-Section Random</i>	<i>Chi-Sq.d.f</i>	<i>Prob.</i>
261.447560	6	0.0000

Source: E-views 9.0

Descriptive Statistic Analysis

Analysis of 195 observations shows that the cash holdings (CH) variable has an average value of 1.6713. The highest recorded value is 67.1284, associated with Kokoh Inti Arebama Tbk. In 2023, while the minimum value of 0.000141 was recorded by Astra International Tbk. (ASII) in 2020. The standard deviation of 8.0710, which significantly exceeds the mean, indicates substantial dispersion in cash holdings across companies. This condition suggests that a small number of firms hold exceptionally large amounts of cash compared to the majority of the sample, potentially reflecting firm-specific liquidity strategies and the presence of extreme observations. The net working capital (NWC) variable has an average value of 0.0058, with a maximum of 862.5787 recorded by Kokoh Inti Arebama Tbk. And a minimum of -353.8876 reported by Astra Graphia Tbk. (ASGR) in 2021. The standard deviation of 80.1427, which is far greater than the mean, indicates extreme dispersion. Such dispersion may be driven by outlier values as well as differences in working capital management and operational scale across industrial firms.

Profitability, measured by ROA, has an average value of 2.9976, with a maximum of 191.1482 observed for Intraco Penta Tbk. (INTA) In 2021, a minimum of -54.1328 was recorded by Asahimas Flat Glass Tbk. (AMFG) in 2020. The standard deviation of 19.1694, which substantially exceeds the mean, indicates wide variation in profitability performance. This variability reflects heterogeneity in firm performance, cost structures, and exposure to economic conditions during the observation period. The leverage (LEV) variable shows an average of 5.7240, with a peak value of 367.6465 recorded by Astra Graphia Tbk. (ASGR) In 2022, a minimum value of 0.0582 was reported by Supreme Cable Manufacturing & Commerce Tbk. (SCCO) in 2024. The standard deviation of 41.8495, which is considerably higher than the mean, indicates substantial heterogeneity in capital structure decisions. This suggests notable differences in financing strategies and risk preferences among firms within the industrial sector. The cash flow (CFL) variable has an average value of 6.1991, with a maximum of 232.0296 recorded by Astra Graphia Tbk. (ASGR) In 2021, a minimum of -0.1527 was reported by Indika Energy Tbk. (INDX) in 2024. The standard deviation of 27.8847, which greatly exceeds the mean, indicates significant variability in firms' operating cash generation, which may arise from differences in firm size, operational scale, and business models.

Capital expenditure (CAP) records an average value of 12.7770, with the highest value of 353.5198 observed for Intraco Penta Tbk. (INTA) in 2021, and a minimum value close to zero. The standard deviation of 56.5114, which is substantially higher than the mean, reflects heterogeneity in investment behavior and capital intensity across firms within the industrial sector. In contrast, the firm size (SIZE) variable shows an average value of 25.1716, with a maximum of 29.3719 and a minimum of 13.8279. The standard deviation of 4.0655, which is lower than the mean, indicates relatively limited dispersion, suggesting that firm size is more evenly distributed compared to other variables and is less likely to be the primary source of extreme variability observed in the data. Overall, the descriptive statistics indicate the presence of extreme dispersion across most financial variables, which may stem from a combination of outlier observations, heterogeneity in industry

structure, and differences in firms' operational and financial characteristics. This condition highlights the importance of employing appropriate panel estimation techniques to control cross-sectional heterogeneity. The use of the Fixed Effect Model (FEM) helps mitigate these concerns by controlling for unobserved firm-specific heterogeneity, thereby supporting the stability and validity of the regression inference.

Table 3. Descriptive Statistic

	CH	NWC	ROA	LEV	CFL	CAP	SIZE
Mean	1.671259	0.005791	2.997608	5.723956	6.199080	12.77704	25.17157
Median	0.071781	0.184727	0,040914	0.414416	0,069473	0.335885	26.62947
Maximum	67.12839	862.5787	191.1482	367.6465	232.0296	353.5198	29.37186
Minimum	0.000141	-	-	0,058163	-	2.71E-06	13.82788
		353.8876	54.13283		0.152710		
Std. Dev.	8.071010	80.14268	19.16940	41.84952	27.88470	56.51141	4.065483

Source: E-views 9.0

T-test (Partial Test)

Based on Table 4, the output from the partial test (t-test) shows the NWC variable has a significant and positive effect on cash holding, as indicated by an estimated coefficient of 0.026619 with a significance level of 0.05. Furthermore, ROA is also proven to have a negative impact with an estimated coefficient of -0.151153 and a probability value of $0.0000 < 0.05$. For LEV, the test results prove a good impact as reflected in the estimated coefficient of 0.050491, and the probability is $0.0000 < 0.05$. CFL also has a significant and positive effect on cash holding, with an estimated coefficient of 0.178088 and a probability value of $0.0000 < 0.05$. In addition, CAP shows a significant and positive effect on cash holding, by an estimated coefficient of 0.277227 and a probability value of $-0.0000 < 0.05$. Meanwhile, SIZE does not have a substantial impact on cash holding. The estimated coefficient is -0.339133 , with a value of $0.1629 > 0.05$ from the alpha value.

Table 4. Regression Estimation Results

Variable	Coeff	T stat	P-value	Description
Net Working Capital (NWC)	0.026619	5.611129	0.0000	Proven
Profitability (ROA)	-0.151153	-12.24239	0.0000	Proven
Leverage (Lev)	0.050491	5.567878	0.0000	Proven
Cash Flow (CFL)	0.178088	12.21685	0.0000	Proven
Capital Expenditure (CAP)	0.277227	7.625640	0.0000	Proven
Firm Size (SIZE)	-0.339133	-1.402228	0.1629	Not Proven

Source: E-views 9.0

The Effect of Net Working Capital on Cash Holding

The empirical revelations of this inquiry intimate that an augmentation in an enterprise's net working capital is concomitant with an accretion in pecuniary reserves, enacted as a stratagem to safeguard fiscal fluidity. Notwithstanding, this inference stands in stark antinomy to the exposition advanced by Al Barak (2025), who delineates a statistically salient inverse nexus between net working capital and cash retention, specifying an adverse coefficient of -0.09 within the milieu of Saudi Arabian manufacturing entities. The present investigation elucidates that firms endowed with elevated liquidity proclivities are inclined toward diminished monetary hoarding, on the grounds that alternative components of circulating assets may be mobilized with greater efficacy as pecuniary surrogates. Such an observation harmonizes with the trade-off conjecture, which postulates that organizations possessing copious reservoirs of working capital are under no compulsion to amass excessive volumes of idle cash.

The output from (Zalsabila Yanti, Nuramal, 2023) Within the nosological industrial stratum listed on the Indonesia Stock Exchange, the inquiry ascertained the existence of a vigorous and affirmative interdependence between net working capital and pecuniary retention. Corporate entities endowed with more expansive circulatory capital exhibit an enhanced faculty for discharging proximate fiscal encumbrances absent recourse to exogenous financing conduits, thereby bequeathing them a more copious accrual of residual earnings. (Judijanto & Ambarwati, 2024) Likewise, articulated that net working capital exerts a constructive and statistically significant influence on cash custodianship among Indonesian manufacturing enterprises, a pronouncement that further fortifies the inferences of the present examination. Concomitantly, this implies that astute stewardship of working capital typically entails the deliberate sequestration of liquid financial buffers to accommodate unforeseen macroeconomic vicissitudes.

The Effect of Profitability on Cash Holding

The empirical results indicate that profitability (ROA) hurts cash holdings, suggesting that more profitable firms tend to maintain lower cash balances because internally generated funds are allocated toward operations, investment, and business expansion rather than being retained as liquid reserves. This finding is particularly relevant in emerging markets such as Indonesia, where firms may prioritize growth-oriented strategies over conservative cash retention. From a theoretical perspective, this negative relationship can be interpreted through agency theory, dividend policy considerations, and investment aggressiveness. Consistent with agency theory, highly profitable firms may limit excess cash holdings to reduce potential agency costs associated with free cash flow, as large cash reserves can increase managerial discretion and inefficiency. In addition, firms with strong profitability may prefer distributing earnings to shareholders or reinvesting them into value-enhancing projects rather than accumulating precautionary cash, especially in environments characterized by concentrated ownership structures.

Moreover, the negative association between profitability and cash holdings may reflect a relatively higher degree of investment aggressiveness among firms in emerging economies. Rather than building precautionary cash buffers, profitable firms may actively deploy retained earnings to capture growth opportunities and enhance competitiveness. This finding contrasts with evidence reported by Al Barak (2025), who documents a positive relationship between profitability and cash holdings in more developed financial systems. However, it is consistent with (Raafika et al., 2023), who report a negative association in a similar context. Overall, these differences suggest that variations in financial market development, governance structures, and managerial incentives may shape distinct cash-holding behavior across countries, highlighting the particular liquidity management practices of firms operating in emerging markets.

The Effect of Leverage on Cash Holding

The output shows that an increase in a company's debt level correlates with an increase in cash holdings allocated for future interest and principal payments. The output from (Al Barak, 2025) shows that cash holdings in Saudi Arabian industrial companies increase significantly with leverage. According to the study, companies with high debt levels often hold more cash holdings as protection against bankruptcy and financial instability. This strategy ensures liquidity, enabling the timely fulfillment of short-term obligations. (Cahaya et al., 2025) The study supports this conclusion, showing that leverage has a positive and significant impact on cash holdings. Companies with high debt levels generally maintain substantial cash holdings to ensure their ability to meet obligations and maintain financial stability.

The Effect of Cash Flow on Cash Holding

This analysis presents findings on the impact of cash flow on cash holding. The study shows that cash flow has a positive effect on cash holding. These findings indicate that companies with better cash flow generally have a greater ability to hold cash. A stable cash flow provides flexibility for

companies in meeting operational needs and facing economic uncertainty without having to rely on external funding sources. A study by Yosita & Tjakrawala (2025) shows that cash flow has a substantial and positive impact on cash holding in cyclical and non-cyclical consumer goods businesses listed on the IDX, in line with this conclusion. Research by Bangun & Priyanto (2024), entitled “The Effect of Operating Cash Flow, Net Working Capital, and Profit Quality on Cash Holdings of Consumer Goods Companies,” states that the effect on cash holding in the consumer goods sector. The output of this study supports the hypothesis that an increase in operating cash flow would lead to higher cash holdings, as companies use cash as a liquidity buffer in the face of uncertainty or urgent operational needs.

The Effect of Capital Expenditure on Cash Holding

The empirical results indicate that capital expenditure (CAP) has a significant and positive effect on cash holdings. This finding suggests that firms engaging in higher investment activities tend to maintain larger cash reserves. Unlike the conventional view that capital expenditure reduces cash balances due to immediate funding requirements, this result supports the precautionary motive theory. Firms anticipating substantial investment projects may deliberately accumulate cash beforehand to ensure funding availability and reduce dependence on external financing. This behavior may also reflect the presence of financing constraints in the industrial sector. Companies operating in environments with limited access to capital markets or higher borrowing costs are more likely to retain internal funds before undertaking large-scale investments. By holding higher cash balances, firms reduce refinancing risk and enhance financial flexibility when executing capital-intensive projects. Although this finding differs from studies that document a negative relationship between capital expenditure and cash holdings (Phan & Thi, 2025), it aligns with evidence suggesting that firms strategically increase liquidity before committing to long-term investments (Halim, 2023). Therefore, the positive association observed in this study may indicate a forward-looking liquidity management strategy rather than a purely contemporaneous cash outflow effect.

The Effect of Firm Size on Cash Holding

An analysis of the connection between both proves that company size has no substantial impact on the policy. This finding indicates that the company size isn't a major factor in cash. A company's decision to hold cash is more influenced by operational liquidity needs and the funding policies implemented by each company. Thus, small and large companies may not share ways of doing things depending on the financial management strategies they implement. The findings reported here differ from those reported by Al Barak (2025), who found a significant and good correlation. Larger companies may maintain financial flexibility because they often have more financial resources and cash reserves (according to Al Barak, 2025). The output here is relevant to that of (Jumah et al., 2023), which revealed that cash holding is not always influenced by business size. Larger companies often need cash more than smaller ones because they have easier access to external funding sources.

CONCLUSION

This research examines the influence of net working capital, profitability, leverage, cash flow, and capital expenditure on cash holding in manufacturing firms operating in Indonesia Stock Exchange, where firm size is used as a control variable. Panel data regression findings indicate that all variables exert a statistically significant positive influence on cash holding, profitability exhibits a weak connection, whereas firm size is not statistically significant. These findings confirm that corporate liquidity policies and investment decisions are more decisive in determining cash holding levels than firm size and emphasize the strategic role of capital expenditure in liquidity management within developing economies. However, the limits here are that the observation period is limited to five years, which may not fully capture long-term economic dynamics, and the variables examined do not yet include governance factors or macroeconomic conditions. Therefore, future studies suggest the period and industry coverage, as well as incorporating corporate governance variables, such as

ownership structure, as indicated by (Bo & Li, 2025), to take the insights from those policies in Indonesia.

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