

Does Firm Size Strengthen the Effect of Liquidity on Corporate Cash Holding?

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Abstract

Purpose: This study investigates the direct effect of non-cash working-capital liquidity on corporate cash holdings and evaluates whether firm size acts as a moderating variable within the liquidity-intensive property and real estate sector listed on the Indonesia Stock Exchange.

Research Methodology: A quantitative explanatory approach using panel data was conducted on 42 property and real estate firms (252 firm-year observations) listed from 2018 to 2023. Data were analyzed using regression analysis by EViews 12 software.

Results: Statistical findings demonstrate that liquidity has a significant negative direct effect on cash holdings. Importantly, firm size significantly moderates the relationship between liquidity and cash holding in a positive direction, confirming its role as a pure moderator that attenuates liquidity substitution behavior.

Conclusions: Organizational scale fundamentally alters corporate liquidity management; while smaller firms substitute non-cash liquidity for physical cash, larger enterprises leverage superior credit access and scale advantages to accumulate internal liquid reserves alongside working capital growth.

Limitations: The scope is limited strictly to audited financial disclosures of property and real estate companies in a single emerging market over a six-year period, unobserving qualitative governance factors.

Contributions: The study provides financial managers with insights to optimize cash conversion cycles and offers Investors and Regulators (*Otoritas Jasa Keuangan*-OJK) a diagnostic scale-adjusted framework for evaluating corporate liquidity risk

Keywords: *Cash Holding, Firm Size, Liquidity, Trade-Off Theory, Pecking Order Theory*

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1. Introduction

Corporate treasurers build cash reserves for one core reason, markets punish firms that run out of options. When credit tightens or supply chains break, companies holding liquid reserves fund operations, meet debt payments, and seize acquisition opportunities without begging banks for emergency credit ([Diaw, 2021](#); [Ibrahim, 2025](#)). Three theoretical frameworks explain this behavior. Trade-Off Theory frames cash holding as a balance between transaction convenience and the

opportunity cost of idle capital. Pecking Order Theory treats cash as the cheapest financing source, ranked above debt and equity because it avoids information asymmetry costs. Keynesian precautionary motive theory adds a third lens: firms hoard cash to survive demand shocks they cannot predict ([Shabbir & Mujtaba, 2016](#)). These frameworks converge on one tension. Cash buffers protect firms from financial distress, yet large reserves invite a different problem: managers who sit on idle capital instead of returning it to shareholders create agency costs that erode firm value ([Guizani, 2017](#); [Yilmaz, & Samour, 2024](#)). A finance team chasing safety today can create a governance liability tomorrow. This tension sits at the center of corporate liquidity research: what combination of financial structure, liquidity policy, and internal capital generation drives the cash-holding decision, and does that combination hold steady across firms of different sizes?

Empirical studies on cash holdings disagree on basic direction. Researchers working from Pecking Order Theory find that profitable firms hold more cash: cash-rich companies avoid external financing because equity issuance signals bad news to the market, so they stockpile internal surpluses instead of tapping bond or equity markets ([Al-Sulayvani, Saeed, Ismail, & Ahmed, 2025](#); [Jebran, Iqbal, Bhat, Khan, & Hayat, 2019](#)). Researchers working from Trade-Off Theory find the opposite. Profitable, liquid firms need less cash because they can access capital markets on favorable terms and hold short-term liquid assets, such as marketable securities and trade receivables, as a direct substitute for cash ([Tarawallie & Bein, 2025](#)). Both camps cite firm-level panel data. Neither camp resolves the contradiction, because each tests profitability's effect on cash without accounting for the financing constraints that separate large firms from small ones. Leverage produces the same split. Some emerging-market studies find a positive relationship between leverage and cash holdings: creditors impose covenant restrictions that force borrowers to hold cash buffers as a monitoring condition. Other studies find a negative relationship, consistent with a debt-capacity substitution effect, where firms treat unused borrowing capacity itself as a cash alternative and hold less cash on hand ([Diaw, 2021](#); [Maryanti, Nabila, Hermawan, & Rahayu, 2026](#)). A linear model cannot hold both findings at once for the same sample. Some studies test for a variable that moderates this relationship. Most do not.

During the COVID-19 pandemic, Indonesian firms operated under accommodative financial conditions. As the economy recovered, Bank Indonesia shifted to monetary tightening by increasing the BI 7-Day Reverse Repo Rate from 3.50% in July 2022 to 6.00% by October 2023. Higher borrowing costs and tighter liquidity encouraged firms to adopt more precautionary cash policies. Listed firms pulled back from aggressive capital deployment and built precautionary cash buffers instead ([Ariel, & Susanti, 2024](#); [Warganegara, Martowidjojo, & Noviyanti, 2026](#)). The shift split the market in two. The most profitable firms generated enough internal cash flow to absorb the rate shock without disrupting operations. Smaller, more leveraged firms faced a harder choice: preserve working capital for daily operations or divert funds into cash reserves for the next shock ([Rustam & Rasyid, 2022](#)). That divergence raises a question the existing literature has not answered. Does firm size explain why the same monetary tightening produced different liquidity responses across the Indonesian market? Or does it just correlate with outcomes that firm-level financial structure already explains?

Firm size sits inside most cash-holding models as a control variable. Few studies test it as a mechanism worth studying on its own terms. [Fatima \(2024\)](#), [Magerakis, Gkillas, Tsagkanos, and Siriopoulos \(2020\)](#), and [Wirianata and Viriany \(2023\)](#) all include firm size in their regressions, but none test whether size changes how liquidity or leverage affects cash retention, each treats size as a shift in the intercept rather than a shift in the slope. That gap matters because Trade-Off Theory's substitution hypothesis, the claim that non-cash liquid assets replace cash reserves, assumes this substitution works the same way at every scale ([Diaw, 2021](#); [Guizani, 2017](#)). However, empirical evidence from capital-market research indicates that firm scale fundamentally alters financial flexibility and external borrowing constraints. Large firms leverage institutional reputation and diversified credit lines to seamlessly substitute non-cash working capital for cash, whereas small firms face severe information asymmetry and credit rationing that weaken this substitution mechanism. Consequently, size does not merely shift baseline cash levels; it alters the sensitivity of cash holdings

to liquidity adjustments ([Maryanti et al., 2026](#); [Wirianata and Viriany, 2023](#)). This study tests firm size as a structural moderator instead of a background control. It models the interaction between firm size and working-capital liquidity, alongside profitability and leverage, using panel data drawn from companies listed on the Indonesia Stock Exchange. That design isolates whether organizational scale changes the terms of the liquidity-cash trade-off, rather than shifting its intercept up or down.

This study's contribution rests on a specific reframing. Firm size operates as a scale-buffering mechanism that changes the strength of the liquidity substitution effect, not as an additive control that shifts average cash holdings up or down. Prior literature assumes the substitution between liquid assets and cash works the same way across firms of every size. This study tests that assumption by modeling the interaction term rather than assuming it away. The reframing advances both Trade-Off Theory and Pecking Order Theory by identifying a boundary condition neither theory specifies on its own: scale advantages can weaken the liquidity-cash trade-off even as profit-driven internal accumulation operates in parallel. The research proceeds in three stages. First, it estimates the direct effects of profitability, leverage, working-capital liquidity, and firm growth on cash holdings using a static panel model built on Indonesian listed-company data from 2018 to 2023. Second, it adds a multiplicative interaction term between liquidity and firm size to test whether scale moderates the substitution effect. Third, it evaluates the results against Trade-Off Theory and Pecking Order Theory predictions and translates the findings into guidance for corporate treasurers, financial regulators, and capital-market analysts working in emerging markets like Indonesia, where interest-rate regimes shift faster than most corporate liquidity policies can adjust.

2. Literature Review and Hypotheses Development

2.1 Grand Theory Framework

Two theories anchor the decision to hold corporate cash: Trade-Off Theory (TOT) and Pecking Order Theory (POT). Trade-Off Theory treats liquidity as an optimization problem. Managers weigh the benefit of holding cash, protection against financial distress and the transaction costs of raising external funds, against the cost of holding it, the return sacrificed by parking capital in low-yield assets instead of operations ([Diaw, 2021](#); [Guizani, 2017](#); [Shabbir, & Mujtaba, 2016](#); [Yilmaz, & Samour, 2024](#)). A manager under this theory sets a target cash ratio and adjusts holdings when the marginal benefit no longer covers the marginal cost. Pecking Order Theory starts from a different premise: information asymmetry between managers and outside investors. Outside investors cannot verify a firm's true prospects as well as insiders can, so external financing costs more than internal financing ([Ibrahim, 2025](#)). Firms under this theory follow a strict financing hierarchy. They spend retained earnings first, borrow debt second, and issue equity as a last resort, because equity issuance signals that insiders believe the market has overpriced the stock ([Pastor, & Gama, 2012](#); [Rehman, & Wang, 2015](#)). Cash sits at the top of that hierarchy. A firm builds cash reserves to avoid stepping down the hierarchy into costlier financing. TOT and POT answer different questions about the same behavior. TOT explains why firms set a target cash level and adjust toward it ([Valentina & Ekadjaja, 2020](#)). POT explains why firms accumulate cash from internal cash flow before touching external markets. Together, the two theories give this study a dual lens: one that predicts an optimizing target for cash reserves and one that predicts a transactional flow of internal funds into precautionary cash ([Fatima, 2024](#); [Gill, & Shah, 2011](#)).

This study's variables translate these two theories into measurable terms. Cash Holding (Y) captures the outcome both theories try to explain: how much of a firm's balance sheet sits in cash and cash equivalents, reflecting its accumulated liquidity buffer ([Ariel, & Susanti, 2024](#); [Astuti, Ariyani, Abdulrahman, & Azhar, 2025](#)). Liquidity, measured through non-cash working capital, tests the substitution logic at the center of Trade-Off Theory. A firm with abundant receivables, inventory, and short-term liquid assets can meet obligations without holding as much physical cash, so higher non-cash liquidity should lower the marginal need for cash reserves ([Diaw, 2021](#); [Ibrahim, 2025](#)). Profitability, Leverage, and Growth serve as control variables that map onto both theories at once. Profitability proxies for the internal cash generation that Pecking Order Theory predicts firms will hoard. Leverage proxies for the debt-monitoring pressure that Trade-Off Theory predicts will force

firms to hold cash as a covenant buffer ([Fajaria, & Isnalita, 2018](#); [Rasyid, 2020](#); [Rustam, & Rasyid, 2022](#)). Firm Size does more work than a standard control. It proxies for market access, information transparency, and negotiating leverage with creditors, three factors that determine how expensive external financing becomes when a firm needs it ([Magerakis, Gkillas, Tsagkanos, & Siriopoulos, 2020](#); [Rifaqat, & Shah, 2026](#)). A large firm with a credit rating and multiple banking relationships faces a different cost structure than a small firm with one lender. This study treats firm size as a structural parameter that changes the size of transaction costs and market frictions across the sample, not as a background number that shifts the regression intercept ([Maryanti, Nabila, Hermawan, & Rahayu, 2026](#); [Wirianata, & Viriany, 2023](#)). The interaction between Liquidity, Cash Holding, and Firm Size follows from Trade-Off Theory's substitution logic once firm size enters as a conditioning factor. Non-cash liquid assets and cash holdings substitute for each other under Trade-Off Theory: as non-cash liquidity rises, the marginal benefit of holding cash falls, so firms hold less of it ([Diaw, 2021](#); [Guizani, 2017](#)). Firm size changes the strength of that substitution effect ([Wijaya, 2021](#)). Large firms benefit from economies of scale, carry lower information asymmetry with lenders, and hold stronger credit ratings than small firms, so they face fewer constraints when they need external capital on short notice ([Magerakis et al., 2020](#); [Manapreechadeelert, 2025](#); [Rifaqat and Shah, 2026](#); [Tarawallie, & Bein, 2025](#)). A large firm can let its cash ratio mirror its non-cash liquidity, because it always has a credit line or a bond market waiting if the buffer runs thin. A small firm cannot make that assumption, so it holds cash even when non-cash liquidity looks sufficient, because it has fewer fallback options if a lender says no. This logic predicts that firm size weakens the substitution pressure between non-cash liquidity and cash reserves as scale increases ([Dewi, & Edastami, 2025](#); [Wibowo, & Wahyudi, 2019](#)). Profitability and leverage enter the model as controls that isolate this size effect from other financial-structure drivers already known to affect cash policy. Together, these three theoretical strands, the substitution mechanism, the size-conditioning logic, and the control structure, give this study a testable account of how organizational scale reshapes precautionary liquidity management in an emerging market ([Ariel and Susanti, 2024](#); [Warganegara, Martowidjojo, & Noviyanti, 2026](#); [Yilmaz and Samour, 2024](#)).

2.2 The Effect of Liquidity on Cash Holding

Trade-Off Theory and Pecking Order Theory predict opposite signs for the relationship between non-cash liquidity and cash holdings, and both mechanisms deserve a direct test. Under Trade-Off Theory, managers weigh the marginal benefit of cash against its holding cost every period ([Guizani, 2017](#); [Shabbir, & Mujtaba, 2016](#)). When a firm carries substantial working capital and short-term receivables, those assets function as a ready substitute for physical cash: a supplier can be paid from receivables collection instead of a cash account, so the firm needs less cash sitting idle ([Diaw, 2021](#); [Ibrahim, 2025](#)). Because holding excess cash sacrifices return, firms with strong non-cash liquidity should hold less cash, all else equal ([Gill & Shah, 2011](#)). Pecking Order Theory tells a different story. Higher operational working capital signals strong internal cash flow, and firms that generate strong cash flow tend to retain more of it as a buffer, not less, because internal funds carry no adverse-selection cost the way external financing does ([Pastor & Gama, 2012](#)). A firm following this logic accumulates liquidity and cash together, rather than trading one for the other, to preserve financial flexibility and avoid touching external capital markets ([Al-Sulayvani, Saeed, Ismail, & Ahmed, 2025](#); [Rehman, & Wang, 2015](#)). Both mechanisms operate on the same variable pair, which is why the empirical evidence below splits in two directions.

Empirical findings split along the same theoretical fault line. One group of studies confirms Trade-Off Theory's substitution prediction. [Guizani \(2017\)](#), [Shabbir and Mujtaba \(2016\)](#), and [Warganegara, Martowidjojo, and Noviyanti \(2026\)](#) find that non-cash liquid assets and working capital act as direct substitutes for cash, so firms with stronger operational liquidity hold less cash on their balance sheets. [Diaw \(2021\)](#) and [Yilmaz and Samour \(2024\)](#) report the same pattern in emerging-market samples: cash buffers shrink as firms gain access to alternative liquid resources. A second group of studies finds the opposite sign, matching Pecking Order Theory's prediction. [Al Ibrahim \(2025\)](#), [Ariel and Susanti \(2024\)](#), [Astuti, Ariyani, Abdulrahman, and Azhar \(2025\)](#), [Davidson and Rasyid \(2020\)](#) find that liquid-asset accumulation moves together with cash retention, both rising as firms strengthen solvency and operational capacity. A third group finds neither pattern holds across every setting. [Dewi and Edastami](#)

(2025) and [Rustam and Rasyid \(2022\)](#), report liquidity effects that shift with industry context, meaning the same variable pair produces a positive coefficient in one sector and a negative coefficient in another.

These competing findings converge on one point: non-cash working-capital liquidity is a primary driver of corporate cash policy, whichever direction it pushes cash holdings. Besides that, working capital reflects the short-term financial position of a firm and the resources tied up in operations between cash outlays and cash collections. The level of net working capital, defined as the difference between current assets and current liabilities scaled by total assets, captures how much liquidity a firm maintains in operating form rather than committing to long-term investments ([Vazquez & Maseda, 2026](#)). Whether a firm's liquidity operates as a substitute under Trade-Off Theory or as a complement under Pecking Order Theory, changes in its liquid-asset base move its cash reserves in a measurable direction. Listed firms navigating volatile credit markets cannot treat liquidity and cash as independent decisions; they manage both together as part of one working-capital policy. In agricultural Small Enterprises (SMEs), liquidity plays a structurally more critical role due to pronounced income seasonality and exposure to climatic shocks. Under such conditions, liquid assets serve as a precautionary buffer against seasonal volatility rather than merely representing residual internal funds ([Nassim, Mahboubi, & Nassim, 2026](#)). Indonesian listed firms operate under interest-rate and credit pressures that make liquid-asset efficiency critical. Once assets are liquid, it means they can be converted into cash quickly and without incurring a loss. A low current ratio implies that a company is having difficulty meeting its debt commitments, service providers, and potential suppliers early enough ([Chika, Promise, Solomon, & Werikum, 2022](#)). Based on the Trade-Off Theory, non-cash liquid assets act as direct substitutes for physical cash, allowing firms to meet short-term obligations without incurring the opportunity cost of holding excess cash. Therefore, as firms increase their non-cash liquidity, the precautionary demand for holding cash diminishes. This theoretical mechanism leads to the following hypothesis:

H₁: Liquidity has a negative effect on Cash Holding

2.3 The Moderating Effect of Firm Size on Cash Holding

Firm size enters this model as a moderator because Trade-Off Theory and Pecking Order Theory both predict that scale changes the terms of the liquidity-cash relationship, not just its average level. Under Trade-Off Theory, firm size proxies for operational scale, diversification, and capital market access ([Guizani, 2017](#); [Magerakis, Gkillas, Tsagkanos, & Siriopoulos, 2020](#)). Large firms carry lower information asymmetry with lenders, pay lower transaction costs when they issue debt or equity, and hold more stable earnings streams, all of which lower their cost of external financing ([Rifaqat & Shah, 2026](#)). A large firm facing a liquidity shortfall can tap a credit line or sell assets on short notice, so its precautionary need for cash shrinks even when its non-cash liquidity looks thin. That access weakens the substitution pressure that weighs harder on smaller firms. Pecking Order Theory adds a second channel. Larger firms generate more internal cash flow and run more sophisticated treasury operations, letting them convert operational liquidity surpluses into strategic cash reserves without triggering financial distress costs ([Maryanti, Nabila, Hermawan, & Rahayu, 2026](#)). Both channels point to the same conclusion: firm size sets the boundary conditions under which liquidity translates into cash holdings, changing the slope of the relationship rather than shifting every firm's cash ratio by a fixed amount.

Most empirical studies on this moderating role agree, with a few exceptions worth naming. [Wirianata and Viriany \(2023\)](#) test firm size as a moderator between liquidity and cash holdings and find that larger organizational scale strengthens a firm's capacity to manage liquid assets without excess cash accumulation. [Maryanti et al. \(2026\)](#) find the same moderating role in an emerging-market sample, where firm size reshapes how firms convert liquidity into cash buffers. [Magerakis et al. \(2020\)](#) and [Manapreechadeelert \(2025\)](#) extend this finding across broader samples, confirming that firm scale governs financial constraints and cash-management efficiency in ways a simple control variable cannot capture. [Dewi and Edastami \(2025\)](#) and [Tarawallie and Bein \(2025\)](#) complicate the picture: both studies find that the moderating effect of firm size weakens or disappears under specific sector

conditions and regulatory environments, so scale does not moderate the liquidity-cash relationship the same way in every market. That inconsistency does not undercut the theoretical case for testing firm size as a moderator. A moderator whose effect varies by institutional context is the kind of variable a single-country study, testing one regulatory regime and one capital market, can isolate without cross-country noise. That contextual variation also signals why single-country designs, which hold the regulatory backdrop constant, produce cleaner estimates of the moderating effect than pooled cross-country samples. Firm size, read across this evidence, functions as an active conditional moderator rather than a static control. Firm size reflects the scale of a company's operations and the value of the assets it controls. Larger firms are generally considered more stable, enjoy easier access to capital markets, and carry a more favorable image among investors ([Rahmakasih & Rayyani, 2025](#)).

A firm's position on the size spectrum determines whether it experiences the full substitution pressure that Trade-Off Theory predicts or a softened version of it, and that determination cannot show up in a model that treats size as an additive control sitting outside the liquidity-cash relationship. Testing firm size as an interaction term, rather than a covariate, lets this study identify where that boundary sits within the Indonesian listed-company sample. A confirmed moderating effect would tell corporate treasurers at small and mid-cap firms that they cannot benchmark their cash policy against large-cap peers, because the same liquidity ratio carries a different cash implication at a different scale. It would also give regulators a scale-specific lens for assessing corporate liquidity risk, rather than one threshold applied across firms of every size. The interaction model developed in the following section formalizes this test using firm size as a continuous moderating variable rather than a categorical split. This reasoning yields the second hypothesis. Based on the Trade-Off Theory, larger firms benefit from easier capital market access, lower information asymmetry, and diversified cash flows. As a result, large firms experience less pressure to aggressively reduce cash holdings when non-cash liquid assets increase compared to smaller, financially constrained firms. Therefore, firm size acts as a moderating mechanism that weakens the negative impact of liquidity on cash holdings. This theoretical mechanism leads to the following hypothesis:

H₂: Firm size weakens the negative effect of Liquidity on Cash Holding

3. Research Methodology

3.1 Research Design and Sample Selection

This study runs a quantitative explanatory design on panel data to test how non-cash working-capital liquidity shapes corporate cash holdings and whether firm size moderates that relationship. We choose the panel structure because it lets us combine cross-sectional variation across property and real estate firms with total population of 42 firms (252 firm-year observations) listed on the Indonesia Stock Exchange during the 2018-2023. The Table 1 is the sample selection process:

Table 1. Sample selection process

Criteria for Sample Selection	Total
Property and Real Estate companies consistently listed on the IDX during 2018-2023	45
Property and Real Estate companies that released annual reports during 2018-2023	42
Period (2018-2023)	6
Data	252

3.2 Operational Definition and Measurement of Variables

Table 2. Operational definition and measurement of variables

Variables	Type	Measurement	Formula	References
Cash Holding (CH)	Dependent	Ratio of cash and cash equivalents to total assets	$\frac{\text{Cash and Cash Equivalents}}{\text{Total Assets}}$	(Ibrahim, 2025; Arie I, 2024)
Liquidity (LIQ)	Independent	Ratio of non-cash net working capital to total assets	$\frac{\text{Net Working Capital} - \text{Cash and Cash Equivalents}}{\text{Total Assets}}$	(Ibrahim, 2025; (Guizani, 2017))
Firm Size (SIZE)	Moderating	Natural logarithm of total assets	$\ln(\text{Total Assets})$	(Davidson, 2020; Putra et al., 2026)
Leverage (LEV)	Control	Ratio of total debt to total assets	$\frac{\text{Total Debt}}{\text{Total Assets}}$	(Ramadhani et al., 2025)
Profitability (PROF)	Control	Return on Assets (ROA)	$\frac{\text{Net Income}}{\text{Total Assets}}$	(Fatima, 2024)
Growth (GROW)	Control	Annual percentage change in revenue	$\frac{\text{Revenue}_t - \text{Revenue}_{t-1}}{\text{Revenue}_{t-1}}$	(Ariel & Susanti, 2024)

To provide a clear framework for empirical testing, the operational definitions, measurement formulas, and references for all variables used in this study are summarized in the Table 2.

3.3 Data Collection Method

We build the dataset from audited secondary financial data. Every figure in this study comes from published annual reports and financial statements, which extracted from the Indonesia Stock Exchange's official portal (www.idx.co.id). We rely on secondary data rather than survey or interview data because the source documents already meet the reliability bar this empirical test needs: Indonesian public accounting firms audit every report we pull, and every filing complies with Indonesian Financial Accounting Standards/ *Standar Akuntansi Keuangan* (SAK) before a company can publish it.

3.4 Data Analysis Method

We run every estimation in EViews version 12 which started with descriptive statistics for each variable, establishing the distribution the regression will work with. We then choose among the Common Effect Model, Fixed Effect Model, and Random Effect Model through three sequential tests: the Chow test compares pooled OLS against the Fixed Effect Model through a redundant fixed effects likelihood ratio test, the Hausman test checks whether firm effects correlate with the regressors to decide between Fixed and Random Effects, and the Lagrange Multiplier test checks whether the Random Effect Model outperforms pooled OLS. We test the hypotheses through Moderated Regression Analysis, as follows in Formula 1.

$$CH_{it} = \alpha + \beta_1 LIQ_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \beta_5 GROW_{it} + \beta_6 (LIQ_{it} \times SIZE_{it}) + \varepsilon_{it} \quad (1)$$

We evaluate the hypotheses using two-tailed t-statistics 5% thresholds, rejecting the null when p-value falls at or below 0.05 or the absolute t-statistic exceeds the critical value, and we assess model fit through the F-statistic.

4. Results and Discussions

Panel data model selection was conducted using sequential Chow and Hausman tests. The Chow test yielded a Cross-section F probability of 0.0000 ($p < 0.05$), rejecting H_0 and indicating that the Fixed

Effect Model (FEM) is preferred over the Common Effect Model (CEM). Subsequently, the Hausman test produced a Cross-section random probability of 0.0142 ($p < 0.05$), which also rejected H_0 in favor of FEM over the Random Effect Model (REM). Consequently, the Fixed Effect Model (FEM) was determined to be the optimal estimation model for the panel data analysis in this study.

Table 3. Descriptive statistics

Statistics	CH	LEV	LIQ	PROF	GROW	SIZE
Mean	0.0684	0.3572	0.1353	0.0391	0.5203	28.7388
Standard Deviation	0.0650	0.2379	0.2599	0.0729	2.2285	1.8699
Minimum	0.0003	0.0023	-1.2566	-0.3005	-0.9999	23.9429
Maximum	0.3279	1.3635	0.9406	0.4617	11.7225	31.8331

Table 3 presents descriptive statistics across the balanced panel of 252 firm-year observations. Cash Holding (CH) averages 0.0684 (SD = 0.0650), ranging from 0.0003 to 0.3279: sampled Indonesian property and real estate firms park about 6.84% of total assets in cash and cash equivalents. Liquidity (LIQ) averages 0.1353 (SD = 0.2599) and swings from -1.2566 to 0.9406, a spread that signals wide variation in non-cash working capital across the sample. Firm Size (SIZE), the natural logarithm of total assets, averages 28.7388 (SD = 1.8699) and ranges from 23.9429 to 31.8331, confirming the panel spans small and large listed developers alike. Leverage (LEV) averages 0.3572 (SD = 0.2379): sample firms fund about 35.72% of total assets through debt, with individual firms ranging from 0.0023 to 1.3635. Profitability (PROF), measured as return on assets, averages 0.0391 (SD = 0.0729) and spans -0.3005 to 0.4617. Revenue Growth (GROW) averages 0.5203 (SD = 2.2285), stretching from -0.9999 to 11.7225, the widest range in the dataset. The widest of these spreads, a swing from -1.2566 to 0.9406 in Liquidity, confirms the sample carries enough cross-firm variation to support a moderated regression rather than a single pooled estimate.

Table 4. Model fit test

Model	F-statistic	p-value	Conclusion
Regression Model	10.308	<0.001	Significant

Table 5. Hypotheses test

Variables	B	Std. Error	t Stat	p-value	Decision
Constant	0.199	0.074	2.698	0.007	-
Leverage	-0.003	0.018	-0.144	0.885	Not Supported
Liquidity	-0.613	0.249	-2.461	0.015	Supported
Profitability	0.372	0.056	6.605	<0.001	Supported
Growth	0.001	0.002	0.643	0.521	Not Supported
Firm Size	-0.005	0.003	-1.878	0.062	Not Supported
LIQ $\times$ SIZE	0.021	0.009	2.339	0.020	Supported

Note: Model Estimation Type = Panel Data Regression with Fixed Effect Model (FEM). Dependent Variable = Cash Holding. Source: Processed by the author using Eviews 12

Table 4 reports an F-statistic of 10.308 ($p < .001$), confirming that the full model, direct effects, controls, and the interaction term together, explains a valid share of the variance in Cash Holding. Table 5 isolates each coefficient. The direct effect of Liquidity on Cash Holding comes back negative and significant: $B = -0.613$, $p = .015$. Because $p = .015$ clears the .05 threshold, we accept H_1 . Firms carrying more non-cash working capital hold less cash, and the size of that coefficient matters as much as its sign: a one-unit increase in the Liquidity ratio corresponds to a 0.613-unit drop in the Cash Holding ratio, holding other variables constant. That magnitude confirms non-cash liquid assets do not just correlate with lower cash reserves; they substitute for cash, the mechanism Trade-Off Theory predicts. Property and real estate firms in this sample treat receivables and short-term operational assets as a genuine alternative to holding cash, not a loose proxy for it. Given the sector's long construction cycles and high working-capital intensity, that substitution pattern

carries real weight: a developer sitting on strong receivables has less reason to lock capital in idle cash.

The negative coefficient linking Liquidity to Cash Holding ($B = -0.613$, $p = .015$) confirms Trade-Off Theory's substitution logic, but the coefficient's size demands an explanation specific to Indonesia's property and real estate sector. Property developers run long construction cycles, often spanning multiple fiscal years between land acquisition and unit handover, and that cycle length forces firms to carry large receivables and work-in-progress inventory as a routine feature of doing business, not an occasional buffer. A developer collecting installment payments from unit buyers holds a stream of near-cash claims that functions as cash without carrying cash's opportunity cost. Once that receivables stream reaches a critical mass, treasury managers face a straightforward calculation: idle cash earns close to nothing, while receivables and short-term operational assets already cover near-term obligations, so holding both becomes redundant. Sectors with shorter operating cycles, retail or manufacturing firms that turn inventory in weeks rather than years, would show a weaker substitution effect, because their non-cash liquid assets convert to cash on too short a cycle to function as a genuine cash alternative. Property and real estate's extended cycle is what makes the mechanism this pronounced.

[Guizani \(2017\)](#) documents the same negative liquidity-cash relationship in a Gulf Cooperation Council sample, arguing that firms operating under bank-dominated financial systems, systems that resemble Indonesia's own credit landscape more than the market-based systems common in the United States, treat non-cash liquid assets as a direct cash substitute because bank credit lines already backstop short-term obligations. [Shabbir and Mujtaba \(2016\)](#) report a comparable pattern in South Asian markets, tying the substitution effect to underdeveloped capital markets that make holding excess cash costlier relative to holding operational liquidity. [Warganegara, Martowidjojo, and Noviyanti \(2026\)](#) find the identical relationship inside Indonesia's own listed-company population, which strengthens the case that this study's result reflects a genuine feature of the Indonesian market rather than a sector-specific artifact confined to property and real estate. What ties these three studies together is not geography alone but a shared institutional profile: emerging markets where firms face real, binding constraints on accessing fast, cheap external capital. In that environment, a firm that already holds substantial non-cash liquidity has less reason to also hold cash, because both serve the same precautionary function and holding both at once wastes return the firm could capture elsewhere. This study's finding fits that pattern, extending it into a sector, property and real estate, that these prior studies did not test, and confirming that the substitution mechanism travels across industries within a single emerging-market institutional setting rather than staying confined to whichever sector a given study happens to sample.

The interaction term, Liquidity $\times$ Firm Size, returns a positive and significant coefficient: $B = 0.021$, $p = .020$. With $p = .020$ under .05, we accept H_2 . This coefficient means firm size softens the negative substitution effect from H_1 : for every one-unit increase in firm size (the log of total assets), the negative pull of Liquidity on Cash Holding weakens by 0.021. Large firms in this sample do not follow the same substitution logic small firms do; scale buys them room to hold liquidity and cash together instead of trading one for the other. Among the control variables, Profitability shows the strongest effect in the model: $B = 0.372$, $p < .001$. A one-unit increase in ROA corresponds to a 0.372-unit rise in Cash Holding, confirming Pecking Order Theory's prediction that internal cash flow feeds into cash reserves. Firm Size's direct effect stays insignificant: $B = -0.005$, $p = .062$. That non-result matters as much as any significant one here: it confirms Firm Size operates as a pure moderator in this model, shaping how Liquidity affects Cash Holding without shifting the average cash ratio on its own. Leverage ($B = -0.003$, $p = .885$) and Growth ($B = 0.001$, $p = .521$) show no measurable relationship with Cash Holding in this sample.

Firm size moderates this substitution because it changes which theory governs a firm's liquidity decisions, not just how much cash a firm holds. Smaller developers in this sample operate with concentrated lender relationships, often a single regional bank or a handful of project-specific credit facilities, and that concentration leaves them exposed if a construction delay or a slowdown in unit

sales disrupts cash flow. A small firm cannot treat receivables as a full cash substitute, because converting those receivables into usable cash on short notice depends on buyers paying installments on schedule, a dependency the firm cannot control. Trade-Off Theory's cost-minimization logic dominates here: the firm holds less cash because non-cash liquidity looks sufficient on paper, accepting real risk if that liquidity turns out to be less liquid than the balance sheet suggests. Larger firms operate under a different calculus. Access to multiple banking relationships, corporate bond issuance, and rights offerings gives large developers a financing backstop that does not depend on any single receivables stream converting on time. That backstop lets Pecking Order Theory's internal-accumulation logic take over: large firms convert operational liquidity surpluses into cash reserves because they can afford to, not because they need cash as a substitute for anything. The positive interaction coefficient ($B = 0.021$, $p = .020$) captures this theoretical handoff. Thriving companies find it easier to secure substantial external funding, such as high-volume debt which facilitates operational activities, boosts productivity, and ultimately enhances profitability ([Chandra, Wijaya, Angelia, & Hayati, 2021](#)).

The moderating result aligns closest with [Wirianata and Viriany \(2023\)](#), who establish that firm size conditions the liquidity-cash relationship among Indonesian manufacturing firms rather than acting as a background control. Their finding and this study's finding, drawn from different sectors within the same national market, point toward a common structural mechanism: Indonesian firms crossing a certain size threshold gain access to financing channels that change their liquidity calculus, regardless of what industry they operate in. That cross-sector consistency matters for theory. This study's specific contribution sits in reframing that pattern: rather than treating firm size as a generic proxy for financial constraint, as much of the literature does, this analysis models size as an interaction term that quantifies how much the substitution effect weakens per unit increase in scale.

Not every study in this literature agrees with these findings, and the disagreement is instructive rather than inconvenient. [Davidson and Rasyid \(2020\)](#), [Mariska, Suhendar, and Nurmalia \(2025\)](#), and [Fatima \(2024\)](#) all report a positive relationship between liquidity and cash holdings, the opposite sign from this study's result. Each of these studies interprets liquidity as evidence of strong operational cash flow under Pecking Order Theory, where firms that generate more liquid assets also generate more cash and accumulate both together rather than substituting one for the other. The gap between their findings and this study's findings traces back to sector composition: none of these three studies isolates property and real estate firms, and the long-cycle, receivables-heavy operating model that drives the substitution effect in this sample does not exist in the manufacturing, consumer goods, or diversified samples those studies analyze. [Yuliyanti, Waspada, Sari, and Nugraha \(2022\)](#) and [Rehman and Wang \(2015\)](#) as cited in [Wirianata and Viriany \(2023\)](#) present a sharper contradiction: both report that firm size fails to moderate the liquidity-cash relationship at all.

5. Conclusions

5.1 Conclusion

Non-cash working-capital liquidity drives a significant negative effect on corporate cash holdings among Indonesian property and real estate firms, confirming Trade-Off Theory's substitution logic inside a sector defined by long construction cycles and receivables-heavy balance sheets. Firm size moderates that relationship in the opposite direction: larger developers convert credit access, lower information asymmetry, and cheaper external financing into room to hold liquidity and cash together, rather than trading one for the other. Firm size's own direct effect on cash holdings stays insignificant, confirming it operates as a pure moderator rather than an independent driver.

These results resolve a theoretical tension in the corporate finance literature. Rather than treating Trade-Off Theory and Pecking Order Theory as competing frameworks, this study demonstrates that firm size acts as a conditional boundary: Trade-Off Theory governs liquidity decisions at the smaller end of the size distribution, while Pecking Order Theory takes over as scale increases.

For corporate treasurers at smaller property firms, non-cash liquidity cannot be blindly relied upon as a cash substitute given buyer payment dependencies. For equity investors, cash ratios must be

evaluated alongside firm scale rather than as a size-neutral risk signal. Finally, for regulatory bodies such as the Financial Services Authority (OJK), these findings caution against applying uniform liquidity thresholds across developers of all sizes.

5.2 Research Limitations

Three limits shape how far these findings travel. The sample covers property and real estate firms alone, listed on the IDX, so the long project cycles and heavy working-capital demands driving the substitution effect may not hold in sectors with faster inventory turnover, such as consumer goods or technology. The six-year observation window, 2018 to 2023, captures a single macroeconomic cycle, missing how the liquidity-cash relationship might shift across a full credit cycle spanning a decade or more. Audited secondary financial statements anchor every measure in this study, which means qualitative drivers behind cash policy, managerial risk tolerance, board governance quality, and off-balance-sheet credit arrangements, never enter the model, even though each could shape how a firm decides how much cash to hold. Purposive sampling also excludes suspended and delisted firms, which may understate how liquidity pressure drives cash decisions among the most distressed developers in the market.

5.3 Suggestions and Directions for Future Research

Future studies should test whether this moderating mechanism holds outside Indonesia's property sector. Researchers can extend the sample to other ASEAN markets, Malaysia, Thailand, and Vietnam, or to sectors with shorter operating cycles, to check whether firm size moderates liquidity-cash decisions the same way across different institutional and industry contexts. Scholars should also deploy dynamic panel techniques, System-GMM or non-linear specifications, to capture threshold effects and endogeneity that a static panel model cannot isolate; a threshold-based approach could pinpoint the exact size at which Pecking Order Theory starts to dominate Trade-Off Theory. A third direction folds governance and ESG variables into the model, ownership concentration, board independence, and sustainability performance among them, since internal oversight quality may shape both firm size effects and liquidity management in ways this study's financial-statement data cannot capture.

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Author Contributions

BB contributed to the conceptualization, theoretical framework, methodology, and drafting of the introduction and literature review. EJA was responsible for data collection, data curation, and statistical analysis. WRS contributed to overall manuscript drafting. SC performed critical revision, supervision, and final approval of the manuscript. All authors have read and agreed to the published version of the manuscript.

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