

The Impact of Cash Flow and Working Capital Efficiency on Liquidity of Indonesian Construction Firms

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Abstract

This study examined the associations between operating cash flow, working capital turnover, and receivables turnover with liquidity in construction firms listed on the Indonesia Stock Exchange (IDX) during 2019–2024. A quantitative correlational design was used with secondary financial statement data. Purposive sampling identified 12 firms and 72 firm-year observations. The source thesis specifies a natural-log (Ln) transformation and reports 43 valid listwise observations but does not provide the transformation syntax or variable-level case-screening record. Liquidity is proxied by the quick ratio. Multiple linear regression, classical assumption tests, partial t-tests, simultaneous F-tests, and coefficients of determination were applied. Operating cash flow was positively and significantly associated with liquidity ($B=0.156$, $p<0.001$), whereas working capital turnover was negatively and significantly associated ($B=-0.426$, $p<0.001$). Receivable turnover is positively and significantly associated with liquidity ($B=0.183$, $p=0.030$). Collectively, the predictors were significant, $F(3,39)=31.033$, $p<0.001$, and explained 70.5% of the variation in liquidity. Liquidity in listed construction firms is associated with internally generated operating cash, working capital use intensity, and collection effectiveness. The final analytical sample was smaller than the initial observation set, the exact transformation and exclusions cannot be reproduced from retained materials, and working capital turnover shares balance-sheet components with the liquidity proxy. This study provides sector-specific, practice-relevant association evidence from an industry characterized by complex long project cycles, substantial financing needs, milestone-based billing, and uneven project-related cash receipts.

Keywords: Construction Firms, Liquidity, Operating Cash Flow, Quick Ratio, Receivables Turnover, Working Capital Turnover

1. INTRODUCTION

The construction sector plays a strategic role in Indonesia economy because infrastructure development supports mobility, production, and other economic activities. The listed construction firms include state-owned and private companies with different project portfolios and financing capacities. Therefore, their financial statements provide a useful setting for assessing short-term financial resilience in an industry marked by capital intensity and long project cycles ([Muhammad & Ulpah, 2025](#)). Liquidity is particularly salient in this industry. Construction projects often require large upfront funding, whereas payments are commonly received through stages of project completion. When internally generated cash is insufficient or external credit becomes constrained, firms may face pressure in meeting current obligations. Research on construction firms likewise shows that project-based operations make working-capital discipline and short-term financial flexibility especially important ([Asare, Owusu-Manu, Ayarkwa, Martek, & Edwards, 2026](#); [Vo, & Ngo, 2023](#)). The sector also operates under changing competitive and project conditions. These shifts reinforce the need for construction firms to maintain sufficient short-term financial capacity while managing project execution, receivable collections, and current obligations. Comparative evidence indicates that the consequences of working-capital decisions differ between construction firms and firms in other industries ([Vo & Ngo, 2023](#)).

The financial architecture of construction businesses makes the timing of cash flows particularly significant. Project mobilization, procurement, subcontracting, equipment use, and labor costs can arise well before the client certifies a work stage or pays an invoice. Consequently, revenue may be recognized in a different period from cash collection. Firms can appear active and record sales while still facing cash shortages and other quick assets for payroll, suppliers, debt service, or other current commitments. This timing problem is more acute when projects are large, progress payments are uneven, or when external financing is constrained. An illustration from the financial statements used in the underlying study is the quick ratio of PT Waskita Karya Tbk. The ratio was 0.99 in 2019, fell to

0.59 in 2020, rose to 1.53 and 1.52 in 2021 and 2022, and declined again to 0.92 and 0.89 in 2023 and 2024, respectively. These movements do not establish a sector-wide trend, but they demonstrate why a point-in-time view of liquidity may be insufficient in project-based industries. A firm's short-term capacity may strengthen when receivables are collected or current obligations fall, and then weaken when cash outlays and debt maturities arrive before project payments are received.

Therefore, this study uses the quick ratio rather than a broader current ratio. The quick ratio excludes inventories and focuses on current assets that are more immediately relevant to settling current liabilities. This choice is suitable for an industry in which certain inventory and project-related asset components may not readily be converted into cash. A higher quick ratio does not automatically indicate superior management, but it provides a more focused indication of whether readily available resources can support obligations that will be due in the near term ([Anton, & Nucu, 2021](#); [Baumol, 1952](#); [Demiraj, Dsouza, & Abiad, 2022](#); [Miller, & Orr, 1966](#)). Operating cash flow is one of the most direct indicators. Unlike accounting profit, it records the net cash flow of core operating activities. A firm may report revenue or profit while its cash remains tied up in uncollected invoices, advances, or working capital requirements. Therefore, operating cash flow offers an important complement to accrual-based performance measures ([Laghari, Ahmed, & López, 2023](#); [Nursita, 2021](#)). In construction businesses, the distinction matters because certification, billing, retention, and payment schedules may delay cash conversion, even after work has been performed.

Working capital turnover and receivables turnover address two other aspects of the cash conversion process. Working capital turnover indicates how intensively the difference between current assets and current liabilities is used to support the sales. It can represent operational efficiency, but very rapid turnover may also be associated with a narrow buffer of current assets ([Afrifa, & Padachi, 2016](#); [Asare et al., 2026](#); [Boisjoly, Conine, & McDonald, 2020](#); [Lyngstadaas, & Berg, 2016](#)). The receivables turnover ratio shows how quickly trade receivables are recovered. In construction, receivables can be affected by milestone certification, client approval, contractual documentation, and the distinction between ordinary trade receivables and longer-term retention claims. This study confines the measurement to average accounts receivable so that the measure remains closely related to the collection process associated with operating revenue.

However, the empirical evidence is not uniform. [Sunardi, Cornelius, and Kumala \(2021\)](#) found a positive and significant relationship between operating cash flow and liquidity in Indonesian manufacturing firms, while [Hidayati, Utomo, and Afkar \(2019\)](#), [Peti, Dekrita, and Aek \(2023\)](#), and [Widyadana and Seputro \(2025\)](#) examined the relevance of operating cash flow to liquidity. In contrast, [Salim and Maududy \(2020\)](#) reported a negative significant association between working capital turnover and liquidity for construction-services state-owned enterprises. International research also finds that working capital outcomes vary with financial constraints, business cycles, and measurement choices ([Aktas, Croci, & Petmezas, 2015](#); [Baños-Caballero, García-Teruel, & Martínez-Solano, 2014](#); [Engqvist, Graham, & Nikkinen, 2014](#); [Ukaegbu, 2014](#)). Related studies connect working capital management, receivables efficiency, liquidity, profitability, and firm value across different organizational settings ([Alfandy, Hendri, & Salmah, 2025](#); [Altaf, & Ahmad, 2019](#); [Heliani, Mareta, Rina, Rahayu, & Ramdaniansyah, 2021](#); [Moussa, 2019](#); [Pangaribuan, Pohan, & Panggabean, 2023](#); [Putri, 2025](#)). These differences may arise from the liquidity proxy, industrial setting, observation period, debt and project characteristics, and the extent to which current assets are convertible into cash.

Therefore, the construction setting is not merely a different sample. Its contractual cash cycle, capital requirements, and dependence on project completion make the relationship between operational activity and liquidity particularly relevant. The present study contributes by examining operating cash flow, working capital turnover, and receivables turnover together, using the quick ratio for 2019–2024. This study seeks to provide a more integrated account of how internally generated cash, the utilization of short-term resources, and collection effectiveness are associated with the short-term financial capacity of Indonesian listed construction firms. Operating cash flow is a direct indicator of a firm's ability to generate cash from core activities. In contrast, working capital turnover

reflects the intensity with which working capital supports sales, and receivables turnover captures the speed of converting credit sales into cash. These measures are relevant to construction firms because project-based payment arrangements can create mismatches between revenue recognition, receivable collections, and cash availability.

Prior evidence is mixed, particularly for working capital and receivables turnover. [Sunardi et al. \(2021\)](#) reported a positive role for operating cash flow in liquidity, whereas [Salim and Maududy \(2020\)](#) found that working capital turnover may be negatively associated with liquidity. International construction evidence likewise stresses that long project cycles, capital intensity, and working-capital policy shape firms' financial risk and operating outcomes ([Michałowski, 2025](#); [Vo and Ngo, 2023](#)). Within the studies reviewed for this article, no prior study has jointly examined operating cash flow, working capital turnover, and receivables turnover using the quick ratio for IDX-listed construction firms over 2019–2024. Therefore, the research gap has three linked elements: mixed findings, the sector-specific cash cycle of construction, and the absence of an integrated three-variable assessment with this liquidity proxy. Accordingly, this study evaluates the three indicators, both individually and jointly, as associations with short-term financial capacity.

2. LITERATURE REVIEW

2.1 Signalling Theory

Signalling theory explains how managers communicate information about a firm's condition to external parties that do not possess the same level of internal information. Signals conveyed through financial reports help investors and creditors assess performance, prospects, and financial risks ([Spence, 1973](#); [Ross, 1977](#)). In this study, liquidity, operating cash flow, working capital turnover, and receivables turnover represent observable financial signals of a firm's capacity to sustain its short-term operations. Positive operating cash flow is expected to signal that a firm can finance routine activities and current obligations from internally generated funds, and faster receivable collection is expected to signal sound credit management and quicker cash conversion. Therefore, both support positive associations with liquidity. In contrast, a high working capital turnover can signal either operating efficiency or a limited working-capital buffer available to absorb short-term obligations. H_2 is consequently deliberately non-directional: its sign remains an empirical issue rather than a prediction implied by the signalling theory.

This theory is useful because it places accounting ratios in a decision context. External parties cannot observe every project delay, collection negotiation, or short-term cash commitment within a firm. Instead, they interpret information released through annual reports and financial statements. A firm that consistently produces cash from operations and turns receivables into cash may appear less dependent on borrowing for emergencies. Conversely, a firm that reports sales but has weak operating cash generation or a thin short-term resource base may present a less reassuring signal to creditors and investors.

Signalling theory does not imply that any single ratio has an unambiguous meaning. A very high working capital turnover may be interpreted as an efficient use of resources when sales are rising and cash receipts are healthy. In another situation, it may reflect an insufficient working capital cushion, particularly when current liabilities are high. Therefore, the same numerical ratio can require interpretation alongside cash flow, the composition of current assets, and the firm's operating context. Consequently, this study tests the three indicators jointly and individually.

This theory also supports a cautious interpretation of the statistical results. Financial ratios are observable signals rather than direct proof of management quality or future solvency. In addition, cash management theory frames liquidity as a balance between maintaining transaction balances and the cost of committing funds to liquid holdings ([Miller & Orr, 1966](#)). The associations reported in this article describe the patterns in the selected construction firms and period. They should not be read as evidence that changing one ratio alone will necessarily cause a proportional change in liquidity for every firm or year.

2.2 Liquidity and Operating Financial Factors

Liquidity is the ability of a firm to meet short-term liabilities when they are due. The quick ratio is appropriate for the construction context because it focuses on current assets that can readily support current liabilities, excluding inventories that may not be immediately converted to cash. Working capital research emphasizes the need to balance liquid resources with operating efficiency rather than treating a larger current asset position as automatically optimal ([Anton, & Nucu, 2021](#); [Baños-Caballero, García-Teruel, & Martínez-Solano, 2014](#); [Demiraj, Dsouza, & Abiad, 2022](#); [Vo, & Ngo, 2023](#)). In the quick ratio calculation, the numerator consists of current assets after inventories are deducted, while the denominator is current liabilities. A ratio below one indicates that the relevant quick assets are lower than current liabilities at the reporting date. A ratio above one indicates broader short-term coverage, although the assessment should still consider asset quality, payment timing, debt maturity, and restricted cash. For construction firms, this distinction is important because not every current asset item has the same speed or certainty of conversion into cash.

The proxy has two advantages. First, it focuses on short-term payment capacity rather than long-term profitability or market value. Second, it avoids treating inventories as automatically available for current debt settlement. However, the quick ratio is not a complete measure of financial health. It does not show the maturity profile of liabilities, the collectability of every receivable, or a firm's ability to access external funding. In particular, trade receivables remain part of quick assets, even though their collection timing and credit quality can vary. Therefore, this study considers it a focused liquidity proxy and interprets its relationship with other financial ratios cautiously ([Petersen & Rajan, 1997](#)).

Operating cash flow describes the net cash generated by a firm's core revenue-producing activities. Its availability supports payments to suppliers, employees, and creditors, thus, higher operating cash flow is expected to strengthen liquidity ([Hidayati, Utomo, & Afkar, 2019](#); [Laghari, Ahmed, & López, 2023](#); [Peti, Dekrita, & Aek, 2023](#); [Widyadana, & Seputro, 2025](#)). The operating cash flow measure in this study scales net cash generated from operating activities by total assets. Scaling makes firms of different sizes more comparable and focuses the analysis on the cash-generating use of an asset base. A positive ratio indicates that normal operations contributed net cash during the period, whereas a negative ratio indicates that operating activities consumed cash. For project-oriented firms, temporary negative operating cash flows can occur when payments to suppliers, subcontractors, and employees precede receipts from clients. However, repeated or large negative values can place greater pressure on short-term liquidity.

The expected direction of the relationship was positive. When operating activities generate more cash, a firm has a larger internally generated resource pool to meet current obligations, fund project execution, and reduce dependence on short-term borrowing. This expectation is consistent with the argument that cash realized from operations is more immediately relevant to liquidity than revenue recognized under accrual-accounting. It also reflects the signalling view that sustainable internal cash generation conveys a more credible signal of financial flexibility than does sales growth alone.

H₁: Operating cash flow is positively associated with construction firm liquidity

Working capital turnover compares net sales to net working capital. This indicates how intensively short-term operating resources are used to create revenue ([Boisjoly, Conine, & McDonald, 2020](#); [Howorth, & Westhead, 2003](#); [Nastiti, Atahau, & Supramono, 2019](#)). Although a higher turnover can denote efficiency, rapid turnover may coincide with a relatively tight working-capital position, which can weaken a firm's ability to meet its current obligations. Therefore, empirical studies support the interpretation of working capital intensity in relation to firm constraints and operating conditions rather than assigning a universal direction ([Aktas, Croci, & Petmezas, 2015](#); [Altaf, & Ahmad, 2019](#); [Kieschnick, Laplante, & Moussawi, 2013](#); [Moussa, 2019](#); [Salim, & Maududy, 2020](#); [Ukaegbu, 2014](#)).

Net working capital is calculated as current assets minus current liabilities. Consequently, the ratio changes not only with sales but also with movements in either component of the balance sheet.

Where net working capital is small, an increase in sales can create a high turnover ratio, even when the firm has little capacity to absorb unexpected project costs or delayed collections. When net working capital is negative, the ratio should be interpreted with particular care because a negative denominator can produce a negative or extreme value.

Therefore, the expected relationship is not mechanically positive. A higher turnover may indicate that the firm is using its short-term resources effectively, but it can also reflect the use of a limited pool of current assets to support large sales volumes. In the latter case, firms may be more exposed to payment delays and may have lower quick-asset coverage for current liabilities. This ambiguity is especially relevant for construction companies, whose project execution requires recurring short-term outlays before cash receipts are fully realized. The working capital turnover measure and the quick ratio both draw on current asset and current liability information. Thus, their association should be interpreted as an observed financial relationship, not as a stand-alone causal mechanism. The low Variance Inflation Factor (VIF) values in the regression indicate a linear correlation among the independent variables, but they do not eliminate the conceptual overlap between the working capital ratio and liquidity proxy. This issue is explicitly acknowledged in the study's limitations.

H₂: Working capital turnover is associated with the liquidity of construction firms

Receivable turnover measures the rate at which receivables are collected in cash. A faster turnover implies a more effective collection, reduces funds tied up in receivables, and can improve the cash available for current liabilities. This expectation is consistent with the evidence on receivables efficiency, trade credit terms, and working capital outcomes ([Ammy, & Alpi, 2018](#); [Boisjoly et al., 2020](#); [Filbeck, Zhao, & Knoll, 2017](#); [Indriani, Ilat, & Suwetja, 2017](#); [Pangaribuan, Pohan, & Panggabean, 2023](#); [Petersen and Rajan, 1997](#); [Tauringana, & Afrifa, 2013](#)). Receivables are an important link between reported sales and cash. The measure used here divides net sales by average accounts receivable, where the average reflects the opening and closing trade receivable balances. By using the average rather than closing receivables alone, the ratio better represents the receivable base that supported sales over the period. A higher ratio indicates that the same average receivable balance is associated with a larger volume of sales or that invoices are converted to cash more rapidly.

In the construction context, it is important to distinguish between trade receivables and other project-related claims. Retention receivables and unbilled or gross claims may have different documentation, certifications, and payment horizons. They may not represent the same short-term collection process as ordinary trade receivables do. Therefore, this study uses accounts receivable as the most direct representation of the collection process linked to operating sales. Faster collection is expected to support cash availability and, in turn, the short-term liquidity. Earlier evidence remains mixed across sectors, but the underlying economic mechanism is clear: when invoices are collected more promptly, less operating capital is locked in credit sales. Firms can use the resulting cash to meet payroll, suppliers, financing costs, and other current obligations. Therefore, the positive hypothesis is grounded in the cash-conversion logic of the construction business rather than in the presumption that a high turnover is always optimal in every commercial relationship.

H₃: Receivables turnover is positively associated with construction firms' liquidity

2.3 Prior Evidence, Research Gap, and Joint Relationship

Prior studies have provided useful but fragmented evidence. [Sunardi, Cornelius, and Kumala \(2021\)](#) examined operating cash flow, receivables turnover, and inventory turnover in manufacturing firms during the COVID-19 pandemic. [Maulana and Karim \(2021\)](#) focused on receivables and cash turnover in the construction company case. [Salim and Maududy \(2020\)](#) assessed working capital turnover, cash turnover, and receivables turnover in state-owned construction services enterprises. [Indriani, Ilat, and Suwetja \(2017\)](#) and [Peti, Dekrita, and Aek \(2023\)](#) provide additional single-firm and cooperative sector evidence concerning receivables, operating cash flow, and liquidity. Broader panel, comparative, and construction-sector studies show that working-capital outcomes depend on industry,

financial constraints, business cycles, and measurement choices ([Asare, Owusu-Manu, Ayarkwa, Martek, & Edwards, 2026](#); [Baños-Caballero, García-Teruel, & Martínez-Solano, 2014](#); [Engqvist, Graham, & Nikkinen, 2014](#); [Habib, & Mourad, 2022](#); [Michałowski, 2025](#); [Moussa, 2018](#); [Vo, & Ngo, 2023](#)).

This study addresses the identified gap by bringing together operating cash flow, working capital turnover, and receivables turnover in a multi-firm construction sample over 2019–2024, using the quick ratio as the liquidity proxy. Its contribution is limited to clarifying the joint role of three operating finance indicators observable from annual financial statements; it does not claim that they exhaust the determinants of liquidity. Leverage, profitability, cash holdings, project mix, debt maturity, and firm-specific governance are also important. Because liquidity reflects several connected operational finance processes, operating cash flow, working capital turnover, and receivables turnover should also be assessed jointly. A firm may have strong cash generation but weak collection or fast sales supported by a narrow working-capital base. Therefore, the simultaneous test examines whether the three indicators, considered together, are statistically associated with liquidity.

H₄: Operating cash flow, working capital turnover, and receivables turnover are jointly associated with construction firms' liquidity

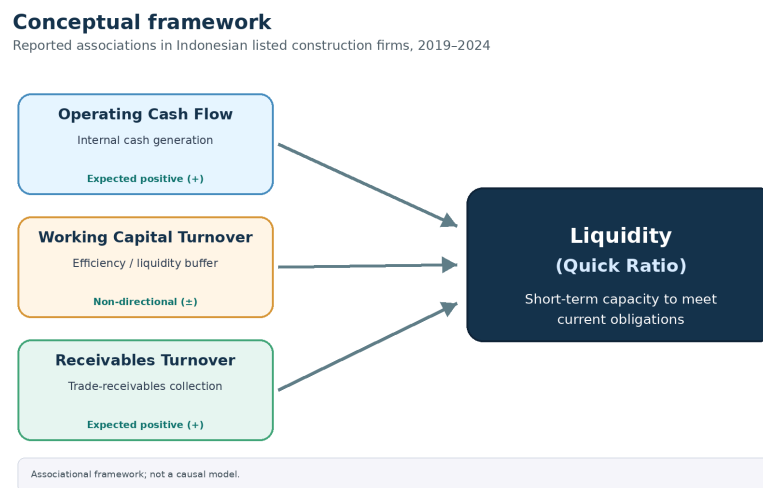


Figure 1. Conceptual framework

Figure 1 shows the relationship between operating cash flow, working capital turnover, and receivables turnover as factors associated with liquidity measured by the quick ratio. Operating cash flow and receivables turnover are expected to have positive associations with liquidity, while working capital turnover represents a non-directional relationship. This framework presents an associational model that examines how internal financial efficiency indicators relate to a firm's short-term ability to meet current obligations.

3. RESEARCH METHODOLOGY

3.1 Research Design, Population, and Sample

This study employed a quantitative explanatory design that used secondary data. The population consisted of construction firms listed on the IDX between 2019 and 2024. Purposive sampling was applied using three criteria: the firm was listed during the observation period, published consecutive annual financial statements, and disclosed complete data on all study variables. Of the 30 firms initially identified, 17 were excluded because their financial statements were not consistently available, and one was excluded because of incomplete variable data. The final initial sample comprised 12 firms over six years, yielding 72 firm-year observations.

The unit of analysis is firm-year. Each observation represents one sampled construction firm in one financial year from 2019 to 2024. This design allows the study to observe variations across firms

as well as changes within the observation period. Nevertheless, it is important to distinguish the structure of the data from a causal experiment: the analysis identifies statistical associations in published financial statement data and does not observe all firm-specific or macroeconomic factors that may affect liquidity.

Purposive criteria were applied to ensure continuity and completeness. A firm needed to be listed in the relevant period, have consecutive annual financial statements available, and disclose sufficient information to calculate all variables. These criteria were designed to avoid mixing incomplete time series with complete observations or estimating ratios from the missing financial statement components.

The study period covers the conditions under which construction firms faced varying project volumes, funding needs, and cash-collection environments. The six-year window also avoids drawing conclusions from a single, unusual reporting year. However, the sample is limited to firms with public financial statements and should not be treated as a representation of all Indonesian construction businesses, particularly unlisted entities with different financing and reporting characteristics.

Table 1. Sample selection

No	Sample criterion	Firms
1	Construction firms identified during 2019–2024	30
2	Less: firms without consecutive financial statements	(17)
3	Less: firms with incomplete variable data	(1)
Final firms		12
Observation years		6
Initial firm-year observations		72

Table 1 shows the typographical inconsistency in the source thesis, such as 12 firms observed for six years yield 72 initial firm-year observations. These inconsistencies may create confusion regarding the accuracy of the reported sample size and the reliability of the empirical analysis. Therefore, the sample description should be carefully revised to ensure consistency between the number of firms, observation period, and total firm-year observations used in the study.

3.2 Data Sources and Variable Measurement

Financial statement data were obtained from the IDX website and the official websites of the sampled firms. Liquidity, operating cash flow, working capital turnover, and receivables turnover are calculated from annual financial statement items. Table 2 presents the operational definitions employed in this study. This study used a documentary collection. Current assets, inventories, current liabilities, and total assets were taken from the statement of financial position; operating cash flow was taken from the statement of cash flows; and net sales and accounts receivable balances were taken from the income statement and relevant statement-of-financial-position disclosures. The use of published annual reports improves traceability because each component can be checked against the relevant issuer's reported data.

Consistent timing is important for these calculations. Liquidity, operating cash flow, and working capital turnover are calculated from the items reported for the same financial year. Receivables turnover uses average accounts receivable, which combines the opening and closing balances, to match a stock of receivables with sales occurring throughout the year. The study treats accounting definitions consistently across firms, but differences in disclosure details and project-account classifications remain practical limits of secondary data research.

Table 2. Operational definitions and measurement

Variables	Proxy and formula	Role
Liquidity (LIQ)	Quick ratio = (Current assets – Inventories) / Current liabilities	Dependent

Variables	Proxy and formula	Role
Operating Cash Flow (OCF)	Operating cash flow / Total assets	Independent
Working Capital Turnover (WCT)	Net sales / (Current assets – Current liabilities)	Independent
Receivables Turn-Over (RTO)	Net sales / Average accounts receivable	Independent

Table 2 separates the dependent and independent variables to clarify the analytical roles of this study. The formulas were retained exactly as specified in the source thesis. Operating cash flow is scaled by total assets, working capital turnover is based on net working capital, and receivables turnover is based on average trade receivables. When current assets equal current liabilities, the working capital turnover denominator is zero, and the ratio is undefined, when net working capital is negative, the ratio is signed and can be extreme. The archived source does not retain case-treatment logs for these conditions.

$$LIQ_{it} = \frac{Current\ Assets_{it} - Inventories_{it}}{Current\ Liabilities_{it}} \quad (1)$$

Formula 1 shows current assets represent the firm's short-term assets, inventories refer to stock items held for sale, and current liabilities represent short-term financial obligations. The quick ratio provides a more conservative measure of liquidity because it focuses only on assets that can be converted into cash relatively quickly. This measurement helps evaluate the firm's immediate financial capacity to settle short-term obligations without depending on inventory sales.

$$OCF_{it} = \frac{Operating\ Cash\ Flow_{it}}{Total\ Assets_{it}} \quad (2)$$

Formula 2 shows operating cash flow represents cash generated from operating activities and total assets represent the firm's overall asset base. This ratio evaluates the firm's ability to generate internal cash resources relative to the size of its asset investment. A higher OCF value indicates stronger operational efficiency and greater capacity to support financial obligations through internally generated funds.

$$WCT_{it} = \frac{Net\ Sales_{it}}{Current\ Assets_{it} - Current\ Liabilities_{it}} \quad (3)$$

Formula 3 shows net sales represent revenue generated from business activities, while the denominator represents the firm's working capital position. This ratio assesses how effectively a firm utilizes its working capital resources to generate sales revenue. A higher WCT value indicates more efficient management of working capital and stronger operational effectiveness in supporting business activities.

$$RTO_{it} = \frac{Net\ Sales_{it}}{Average\ Accounts\ Receivable_{it}} \quad (4)$$

Formula 4 shows average accounts receivable represents the average outstanding credit sales receivables during the observation period. This ratio indicates the effectiveness of receivable management in supporting liquidity performance. A higher RTO value reflects faster collection of receivables, improved cash conversion efficiency, and stronger liquidity management.

3.3 Data Analysis

The analysis began with descriptive statistics for the 72 initial firm-year observations. The source thesis states that the data were transformed using natural logarithms (Ln) before the regression and all classical assumption tests, and it reports 43 valid observations on a listwise basis. Under an ordinary Ln transformation, SPSS retains only cases with valid transformed values for all variables; raw operating cash flow and working capital turnover include negative values for which ordinary natural logs are undefined. However, the thesis does not provide the exact SPSS syntax, any offset or reflection procedures, or a variable-level case-screening table. Thus, the 29-observation reduction is attributable to listwise validity after transformation but cannot be precisely disaggregated by variables from the retained source. This study reports the original 43-observation estimates transparently and does not re-estimate the underlying data. Multiple linear regression was used to test the partial and simultaneous relationships at a 5% significance level. Because the observations are firm-years, the estimates are interpreted as pooled associations, rather than definitive causal effects. The reported model was:

$$\ln(LIQ_{it}) = \alpha + \beta_1 \ln(OCF_{it}) + \beta_2 \ln(WCT_{it}) + \beta_3 \ln(RTO_{it}) + \varepsilon_{it} \quad (5)$$

Formula 5 shows the regression model examines the effect of Operating Cash Flow (OCF), Working Capital Turn-Over (WCT), and Receivables Turnover (RTO) on Liquidity (LIQ). The model applies a logarithmic transformation to all variables to reduce scale differences and improve model estimation. The regression equation is specified with liquidity as the dependent variable, while operating cash flow, working capital turnover, and receivables turnover serve as independent variables, with ε representing the error term.

The classical assumption checks followed the decision rules used in the underlying study. Residual normality was assessed using the Kolmogorov–Smirnov test and supporting plots, with a significance value above 0.05 interpreted as being consistent with normal residuals. Multicollinearity was assessed using tolerance and the Variance Inflation Factor (VIF), with tolerance above 0.10 and VIF below 10, indicating no problematic linear dependence among the independent variables. Heteroscedasticity was assessed using the Glejser test and residual scatterplot. The source study reported Durbin–Watson as an autocorrelation diagnostic and supplied the relevant bounds for $n=43$ and $k=3$ ($dL=1.3663$; $dU=1.6632$). Its value of 1.689 lay between dU and $4-dU=2.3368$, leading the source to conclude that there was no autocorrelation in the residuals. Because the observations are pooled firm-years and no Breusch–Godfrey or panel-specific serial correlation test was reported, this conclusion remains a limited diagnostic rather than conclusive evidence for a pooled panel structure.

The hypotheses were evaluated using regression coefficients and partial t-tests. A p-value below 0.05 was considered as evidence that the coefficient was statistically different from zero within the reported model. The F-test assesses whether the three predictors are jointly associated with liquidity, while R^2 and adjusted R^2 describe the proportion of variation accounted for by the reported specification. These diagnostics assess the stated regression model; however, they do not address all possible sources of omitted-variable bias, accounting-measure overlap, or unobserved firm effects.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 3. Descriptive statistics before transformation

Variables	Minimum	Maximum	Mean	SD
Operating Cash Flow (OCF)	−0.1102	0.5766	0.0195	0.0900
Working Capital Turnover (WCT)	−747.8160	82.0482	−6.5408	89.1801
Receivables Turn-Over (RTO)	1.1745	13.7610	5.6039	2.4419
Liquidity (LIQ)	0.5045	3.2751	1.4169	0.6488

Table 3 shows the descriptive statistics for the 72 initial firm-year observations in the sample. The quick ratio averaged 1.4169, indicating that the sample firms generally had sufficient liquid assets to cover their current obligations. The standard deviation of working capital turnover is substantially larger than its mean, showing marked variation across firms and years. This variation is consistent with the uneven working capital needs and project cycles of the construction sector.

Operating cash flow ranged from -0.1102 to 0.5766 , with a mean of 0.0195 and standard deviation of 0.0900 . The standard deviation being greater than the mean indicates substantial dispersion in the ability of the sampled firms to generate cash from operating activities relative to their asset bases. The source data identified the minimum at WEGE in 2022 and the maximum at ACST in 2020. Such dispersion is plausible in construction, where the receipt and disbursement patterns of large projects can differ sharply across issuers and years.

Working capital turnover shows the widest range, its minimum was -747.8160 , maximum was 82.0482 , and standard deviation was 89.1801 . These extreme values require cautious substantive reading. Because the denominator is net working capital, values can become very large or negative when current assets and current liabilities are close in magnitude or when the net working capital is negative. Therefore, the raw descriptive table does not support the simplistic conclusion that every high turnover is a sign of superior efficiency. Instead, it reveals that short-term balance sheet positions varied greatly across the sample.

The receivables turnover ranged from 1.1745 to 13.7610 and averaged 5.6039 times, with a standard deviation of 2.4419 . Compared with working capital turnover, the collection measure is more stable, but the spread still indicates material differences in the speed at which trade receivables are converted into cash. The liquidity proxy ranged from 0.5045 to 3.2751 , with a mean value of 1.4169 . The average should not obscure the lower end of distribution. Observations below one indicates a shortfall of quick assets relative to current liabilities on the reporting date. The source thesis reports 43 valid listwise transformed observations but does not state how many observations had non-positive OCF or WCT or provide a variable-specific exclusion record; no such attrition counts are therefore reported here. These descriptive patterns justify the examination of the three financial indicators together. Liquidity is not merely an issue of cash generation, collection, or short-term resource turnover. This reflects how a firm balances all three processes while managing project costs and current obligations.

4.2 Classical Assumption Tests

The reported diagnostics supported normal residuals (Kolmogorov–Smirnov $p=0.200$), no multicollinearity ($VIF \leq 1.041$), and no heteroscedasticity (all Glejser p -values > 0.05). The reported Durbin–Watson statistic was 1.689 . With $n=43$ and $k=3$, the source used $dL=1.3663$, and $dU=1.6632$. Because $dU < 1.689 < 4-dU=2.3368$, it was concluded that the transformed regression did not show any autocorrelation. This inference is nevertheless interpreted cautiously for the pooled firm-year model because a Breusch–Godfrey or panel-specific serial correlation test was not reported.

Table 4. Summary of classical assumption tests

Test	Result	Conclusion
Normality (Kolmogorov–Smirnov)	Asymp. Sig.=0.200	Residuals normally distributed
Multicollinearity	VIF: OCF=1.000, WCT=1.041, RTO=1.041	No multicollinearity
Heteroscedasticity (Glejser)	p: OCF=0.695, WCT=0.980, RTO=0.137	No heteroscedasticity
Autocorrelation	Durbin–Watson=1.689	Reported descriptively, interpret cautiously for pooled firm-year data

Table 4 shows the reported regression residuals did not significantly depart from the criterion used in the study. The VIF values were close to one, suggesting that the independent variables did not

display problematic linear dependence. The Glejser probabilities were all above 0.05, therefore, the reported model did not show evidence of heteroscedasticity under that test. The source's Durbin–Watson conclusion is reported with its stated decision bounds, but it should not be treated as definitive for pooled firm-year data in the absence of a Breusch–Godfrey or panel-specific serial correlation test.

These results support the internal diagnostics of the reported multiple regression model. However, these limitations should not be overstated. Classical assumption tests do not establish that all financial ratios are conceptually independent or that the model captures every firm-specific influence on liquidity. In particular, the construction of the working-capital-turnover and quick-ratio measures calls for careful interpretation because both use current asset and current liability information.

4.3 Hypothesis Testing

The estimated regression results are shown in Table 5. All three independent variables were statistically significant at the 5% level of significance. Operating cash flow and receivables turnover have positive coefficients, whereas working capital turnover has a negative coefficient.

Table 5. Multiple regression results

Variables	Coefficient (B)	SE	Beta	t	p-value	Decision
Constant	1.103	0.169	–	6.522	<0.001	–
Operating cash flow (H_1)	0.156	0.027	0.503	5.781	<0.001	Supported
Working capital turnover (H_2)	–0.426	0.056	–0.680	–7.664	<0.001	Supported
Receivables turnover (H_3)	0.183	0.081	0.200	2.253	0.030	Supported

Table 5 shows the standardized coefficients provide an additional comparison of the reported associations within the model. Working capital turnover had the largest absolute beta (–0.680), followed by operating cash flow (0.503), and receivables turnover (0.200). This ordering does not establish the economic importance of one variable independently of the others, but it suggests that the reported variation in working capital turnover is strongly associated with variation in liquidity in the final analytical sample. The smaller beta for receivables turnover remains statistically significant and economically relevant because collection speed is directly connected to cash availability.

Table 6. Simultaneous test and model fit

Statistic	Value	Interpretation
F-statistic	31.033	Model is statistically significant
F-test p-value	<0.001	H_4 supported
R	0.840	Strong model association
R^2	0.705	70.5% of liquidity variation explained
Adjusted R^2	0.682	Model fit after adjustment
Regression observations	43	Final transformed sample

Table 6 shows the joint model was statistically significant, $F(3,39)=31.033$, $p<0.001$, and the reported R^2 was 0.705. Thus, the three ratios collectively accounted for 70.5% of the variation in the quick ratio measure within the reported specification. The adjusted R^2 of 0.682 remained substantial after adjusting for the number of predictors. The remaining 29.5% of the variation may be related to factors not included in the model, such as debt maturity, cash holdings, profitability, leverage, project mix, payment terms, and firm-specific management decisions.

4.4 Operating Cash Flow and Liquidity

Operating cash flow had a positive and significant coefficient ($B=0.156$; $p<0.001$), supporting H_1 . This result indicates that firms with stronger cash inflows from core operations tend to exhibit higher liquidity. This finding is intuitive in a project-based industry, internally generated cash supports payments for operations and current liabilities without requiring immediate external financing. In signaling theory terms, a stronger operating cash flow provides a favorable signal that the firm can

sustain day-to-day obligations through its main business activities. The results are consistent with those of [Sunardi et al. \(2021\)](#) and [Hidayati et al. \(2019\)](#), while [Peti et al. \(2023\)](#) and [Widyadana and Seputro \(2025\)](#) provide further evidence of the relevance of operating cash flow for short-term liquidity. For construction firms, this relationship is particularly important because revenue recognition and physical project completion do not necessarily coincide with cash collection. Healthy operating cash flow reduces the liquidity risk associated with timing differences.

The construction setting helps to explain this result. Payments to subcontractors, material suppliers, and employees often cannot wait until a client collects a progress payment. When core operations generate net cash, firms have greater flexibility to finance their needs using internal resources. They may be less dependent on short-term loans or delaying payments to counterparties. Conversely, persistent negative operating cash flows can make a firm more vulnerable when project receipts are delayed or when access to external credit tightens. The individual observations described in the source thesis are consistent with this mechanism of action. It reports episodes in which WIKA recorded negative operating cash flow values alongside a quick ratio below one. These cases are illustrative rather than causal proof, but they show why operating cash flow is important in a liquidity assessment. A firm's ability to generate cash internally can be as important as the value of its reported assets when its current liabilities require payment. This result has practical implications for managers. Monitoring profits alone is insufficient. Treasury and project finance functions should connect project billing, collection schedules, supplier payments, and operating cash forecasts. Early identification of a gap between reported project progress and expected cash receipts can help management protect quick assets before short-term obligations accumulate.

4.5 Working Capital Turnover and Liquidity

Working capital turnover had a negative and significant coefficient ($B = -0.426$; $p < 0.001$), supporting H_2 . The results suggest that a faster use of net working capital to generate sales is associated with lower liquidity in the observed firms. While rapid turnover is often interpreted as an efficiency indicator, it may also indicate that firms operate with a thin working capital cushion. This conditional interpretation is consistent with the literature, in which working capital effects depend on financing constraints and the balance between cash and net operating working capital ([Aktas, Croci, & Petmezas, 2015](#); [Baños-Caballero, García-Teruel, & Martínez-Solano, 2014](#); [Kieschnick, Laplante, & Moussawi, 2013](#)). In construction projects, significant operating requirements can absorb liquid resources before cash receipts are realized.

This finding aligns with [Salim and Maududy \(2020\)](#), who reported a negative relationship between working capital turnover and firm liquidity. Studies relating working-capital management to liquidity, profitability, efficiency, and firm value likewise show that turnover requires contextual interpretation rather than automatic treatment as a favorable outcome ([Alfandy, Hendri, & Salmah, 2025](#); [Filbeck, Zhao, & Knoll, 2017](#); [Habib, & Mourad, 2022](#); [Putri, 2025](#)). This result should not be interpreted as evidence that all turnover is harmful. Instead, it indicates that turnover must be interpreted with the availability of short-term liquid assets and current obligations. In the present setting, high turnover can convey both operational intensity and liquidity pressure.

The source thesis provides an illustration of ADHI. The working capital turnover increased from 3.5838 in 2020 to 24.3520 in 2021, whereas the quick ratio declined from 0.8781 to 0.7758. A single firm-year comparison cannot establish the regression relationship; however, it demonstrates the mechanism contemplated by H_2 , sales may be supported by a rapidly turning working-capital base, while the availability of quick assets to cover current liabilities becomes tighter.

A negative relationship may also arise when firms use the most available resources to sustain project execution. In this condition, turnover can be high precisely because the firm operates with a small net working-capital base. Therefore, the ratio must be read alongside cash receipts, current liabilities, and the timing of project obligations. Management should aim for a working-capital level that supports productive activity without eroding the liquidity buffer required to absorb delays in certification or collection.

This result should be interpreted with caution because of the shared accounting components of working capital turnover and the quick ratio. The evidence supports an association in the reported data, not the conclusion that an increase in turnover inevitably reduces liquidity. The source output does not include a sensitivity model excluding working capital turnover; therefore, no such robustness result is claimed. Future research should test alternative liquidity measures and cash conversion cycle variables to assess whether the pattern remains when the degree of formula overlap is reduced.

4.6 Receivables Turnover and Liquidity

Receivables turnover has a positive and significant coefficient ($B=0.183$; $p=0.030$), supporting H_3 . Firms that converted receivables into cash more quickly tended to have higher liquidity. This result is relevant to construction firms because payments are commonly linked to the project milestones. Delayed collection can leave substantial funds tied up in receivables, even when the firm reports sales or profits. This result supports the view that collection effectiveness improves the availability of cash and other liquid resources for current obligations. This is also consistent with the findings of [Ammy and Alpi \(2018\)](#) and [Indriani et al. \(2017\)](#), whose related work links receivables management and trade-credit conditions with working-capital efficiency and performance outcomes ([Boisjoly et al., 2020](#); [Pangaribuan et al., 2023](#); [Petersen & Rajan, 1997](#)). From a signalling perspective, a higher receivables turnover provides a positive signal of credit management effectiveness and lower collection risk.

The source data offer a practical illustration of JKON. Receivables turnover rose from 3.2380 times in 2020 to 4.6191 times in 2021, while the quick ratio increased from 1.4445 to 1.8957. This pattern is consistent with the expected collection-to-cash mechanisms. When trade receivables are collected more quickly, less capital remains tied up in unpaid invoices, and the firm has more resources available for obligations that mature in the short term. For construction firms, effective collection requires more than just sending invoices promptly. It can depend on complete billing documentation, timely project certification, coordination between project and finance teams, monitoring client payment terms, and early escalation of disputed claims. The positive coefficient suggests that these collection-related processes are relevant to liquidity, even though the study's financial statement data do not directly observe each operational practice. The managerial implication is to treat receivables aging as a liquidity-management issue, not solely as a revenue-control issue. Firms should monitor the value and age of trade receivables, distinguish ordinary trade receivables from longer-term project claims, and align collection targets with their current liabilities schedule. Investors and creditors may also consider receivables turnover and operating cash flow when assessing whether reported revenue is converted into cash.

4.7 Joint Effect of the Three Predictors

The simultaneous test produced $F(3,39)=31.033$ with $p<0.001$, so H_4 was supported. The model's R^2 of 0.705 indicates that operating cash flow, working capital turnover, and receivables turnover jointly explain 70.5% of the observed variation in liquidity. The results highlight that the liquidity of construction firms should not be assessed using a single indicator. It reflects the interaction of internally generated operating cash, the manner in which working capital is committed to sales, and the speed at which receivables are collected. Collectively, the findings describe a coherent operational finance picture. Liquidity is stronger when operations generate cash and when trade receivables are converted into cash efficiently. Simultaneously, intense working capital turnover can coincide with pressure on the buffer of short-term resources. Therefore, these three indicators should be monitored as a set. Improving collection without controlling project outlays may not fully protect liquidity, likewise, growing sales without sufficient cash conversion may increase, rather than relieve, short-term pressure.

The results have implications for different decision-makers. Management can use the three ratios as an early warning dashboard, such as operating cash flow identifies whether core activities are producing cash, working capital turnover flags the intensity of short-term resource use, and receivables turnover indicates the speed of collections. Investors can use the same indicators as complementary signals rather than relying solely on earnings or liquidity ratios. Creditors may pay

particular attention to cases in which sales growth and high turnover are not accompanied by operating cash generation or timely collections.

The results should not be generalized beyond their evidentiary scope. The model is based on public financial statement ratios from a purposively selected group of listed firms and a final analytical sample smaller than the initial 72 observations. It excludes leverage, profitability, project-level payment terms, and firm-fixed effects. The source thesis identifies Ln transformation and listwise validity but does not retain a syntax or per-variable exclusion record sufficient to reproduce the final sample. Accordingly, the evidence is most useful as a sector-specific association that guides further analysis and financial monitoring rather than as a definitive causal ranking of liquidity determinants.

5. CONCLUSIONS

5.1 Conclusion

This study examines the association between operating cash flow, working capital turnover, and receivables turnover with liquidity in Indonesian listed construction firms during 2019–2024. Operating cash flow and receivables turnover are positively and significantly associated with liquidity, whereas working capital turnover is negatively and significantly associated. The three variables were jointly significant, and the reported model explained 70.5% of the liquidity variation. For managers, the findings indicate the need to strengthen operating cash generation, balance the intensity of working capital use with the availability of liquid assets, and improve receivables collection. Investors and creditors can use these three indicators as complementary signals when assessing the short-term financial resilience of construction firms.

5.2 Research Limitations

The study is limited by the final analytical sample of 43 observations, which is smaller than the 72 initial firm-year observations used in the analysis. The source thesis states that all analyses used a natural-log (Ln) transformation and reports 43 valid observations on a listwise basis, but it does not include the transformation syntax, any treatment of non-positive values, or a variable-level exclusion log. Therefore, the 29-observation reduction cannot be reproduced or disaggregated from the retained source. This is a methodological limitation of the reported estimates and not merely a presentation issue. The study also uses the quick ratio as a single liquidity proxy, omits financial and firm-specific controls, and employs a working capital turnover measure that shares current asset and current liability components with the quick ratio. Therefore, its results must be interpreted as cautious associations rather than conclusive causal effects.

5.3 Suggestions and Directions for Future Research

Future research should rerun the analysis from the original calculation sheet and SPSS syntax, report a complete case screening log, and use a transformation that is valid for signed values or retain a model specification that does not require their exclusion. It should also extend the observation period, use alternative liquidity and cash conversion measures, add firm-specific control variables such as leverage, profitability, cash holdings, and debt maturity, and apply panel data specifications with robust inference. Supplementary models using the current ratio, cash ratio, days sales outstanding, or the cash conversion cycle, and a sensitivity model excluding working capital turnover, would help assess the robustness of the reported relationships. A complete replication package containing the selected firm list, calculation sheet, transformation syntax, and statistical output would further strengthen transparency.

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AUTHOR CONTRIBUTIONS

KPP contributed to the conceptualization, literature review, data collection, data analysis, and manuscript preparation. UK contributed to the research methodology, validation, supervision, and critical revision of the manuscript. DD contributed to the review process, interpretation of findings, and refinement of the final manuscript. All authors have read and approved the final version of the manuscript.

REFERENCES

- Afrifa, G. A., & Padachi, K. (2016). Working capital level influence on SME profitability. *Journal of Small Business and Enterprise Development*, 23(1), 44-63. <https://doi.org/10.1108/JSBED-01-2014-0014>
- Aktas, N., Croci, E., & Petmezas, D. (2015). Is working capital management value-enhancing? Evidence from firm performance and investments. *Journal of Corporate Finance*, 30, 98-113. <https://doi.org/10.1016/j.jcorpfin.2014.12.008>
- Alfandy, R., Hendri, E., & Salmah, N. N. A. (2025). Analisis pengelolaan modal kerja dalam upaya meningkatkan likuiditas dan profitabilitas pada PT Astra Agro Lestari Tbk yang terdaftar di Bursa Efek Indonesia (BEI). *Jurnal Media Akuntansi (Mediasi)*, 7(2), 364-378. <https://doi.org/10.31851/jmediasi.v7i2.18367>
- Altaf, N., & Ahmad, F. (2019). Working capital financing, firm performance and financial constraints. *International Journal of Managerial Finance*, 15(4), 464-477. <https://doi.org/10.1108/IJMF-02-2018-0036>
- Ammy, B., & Alpi, M. F. (2018). Pengaruh perputaran piutang dan perputaran modal kerja terhadap likuiditas perusahaan otomotif dan komponen. *Jurnal Riset Finansial Bisnis*, 2(3), 135-144.
- Anton, S. G., & Nucu, A. E. A. (2021). The impact of working capital management on firm profitability: Empirical evidence from the Polish listed firms. *Journal of Risk and Financial Management*, 14(1), 9. <https://doi.org/10.3390/jrfm14010009>
- Asare, E., Owusu-Manu, D.-G., Ayarkwa, J., Martek, I., & Edwards, D. J. (2026). Empirical perspective of working capital management practices among large building construction firms in Ghana. *Construction Innovation*, 26(3), 768-785. <https://doi.org/10.1108/CI-11-2023-0287>
- Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2014). Working capital management, corporate performance, and financial constraints. *Journal of Business Research*, 67(3), 332-338. <https://doi.org/10.1016/j.jbusres.2013.01.016>
- Boisjoly, R. P., Conine, T. E., Jr., & McDonald, M. B. (2020). Working capital management: Financial and valuation impacts. *Journal of Business Research*, 108, 1-8. <https://doi.org/10.1016/j.jbusres.2019.09.025>
- Demiraj, R., Dsouza, S., & Abiad, M. (2022). Working capital management impact on profitability: Pre-pandemic and pandemic evidence from the European automotive industry. *Risks*, 10(12), 236. <https://doi.org/10.3390/risks10120236>
- Enqvist, J., Graham, M., & Nikkinen, J. (2014). The impact of working capital management on firm profitability in different business cycles: Evidence from Finland. *Research in International Business and Finance*, 32, 36-49. <https://doi.org/10.1016/j.ribaf.2014.03.005>
- Filbeck, G., Zhao, X., & Knoll, R. (2017). An analysis of working capital efficiency and shareholder return. *Review of Quantitative Finance and Accounting*, 48(1), 265-288. <https://doi.org/10.1007/s11156-015-0550-0>
- Habib, A. M., & Mourad, N. (2022). Analyzing the efficiency of working capital management: A new approach based on DEA-Malmquist technology. *SN Operations Research Forum*, 3(3), 49. <https://doi.org/10.1007/s43069-022-00155-7>
- Heliani, H., Mareta, F., Rina, E., Rahayu, M. S., & Ramdaniansyah, M. R. (2021). Liquidity, profitability and asset growth towards the dividend payout ratio. *Accounting and Financial Review*, 4(2), 225-232. <https://doi.org/10.26905/afr.v4i2.6324>

- Hidayati, R., Utomo, S. P., & Afkar, T. (2019). Pengaruh arus kas operasional, arus kas investasi dan arus kas pendanaan terhadap likuiditas perusahaan asuransi yang terdaftar pada BEI. *Majalah Ekonomi*, 24(1), 135–141.
- Howorth, C., & Westhead, P. (2003). The focus of working capital management in UK small firms. *Management Accounting Research*, 14(2), 94–111. [https://doi.org/10.1016/S1044-5005\(03\)00022-2](https://doi.org/10.1016/S1044-5005(03)00022-2)
- Indriani, D., Ilat, V., & Suwetja, I. G. (2017). Pengaruh perputaran piutang dan arus kas terhadap likuiditas PT Astra International Tbk. *Jurnal EMBA*, 5(1), 136–144. <https://doi.org/10.35794/emba.v5i1.15515>
- Kieschnick, R., Laplante, M., & Moussawi, R. (2013). Working capital management and shareholders' wealth. *Review of Finance*, 17(5), 1827–1852. <https://doi.org/10.1093/rof/rfs043>
- Laghari, F., Ahmed, F., & López García, M. de las N. (2023). Cash flow management and its effect on firm performance: Empirical evidence on non-financial firms of China. *PLOS ONE*, 18(6), e0287135. <https://doi.org/10.1371/journal.pone.0287135>
- Lyngstadaas, H., & Berg, T. (2016). Working capital management: Evidence from Norway. *International Journal of Managerial Finance*, 12(3), 295–313. <https://doi.org/10.1108/IJMF-01-2016-0012>
- Maulana, J., & Karim, A. (2021). Pengaruh perputaran piutang dan perputaran kas terhadap tingkat likuiditas (quick ratio) pada perusahaan konstruksi: Studi kasus PT Wijaya Karya Tbk. *Land Journal*, 1(1), 76–87. <https://doi.org/10.47491/landjournal.v1i1.596>
- Michałowski, M. (2025). Working capital management strategy effects on firm profitability and risk: An analysis of Polish listed construction companies. *Ekonomia Międzynarodowa*, 47, 23–43. <https://doi.org/10.18778/2082-4440.47.02>
- Miller, M. H., & Orr, D. (1966). A model of the demand for money by firms. *The Quarterly Journal of Economics*, 80(3), 413–435. <https://doi.org/10.2307/1880728>
- Moussa, A. A. (2018). The impact of working capital management on firms' performance and value: Evidence from Egypt. *Journal of Asset Management*, 19(4), 259–273. <https://doi.org/10.1057/s41260-018-0081-z>
- Moussa, A. A. (2019). Determinants of working capital behavior: Evidence from Egypt. *International Journal of Managerial Finance*, 15(1), 39–61. <https://doi.org/10.1108/IJMF-09-2017-0219>
- Muhammad, L. T., & Ulpah, M. (2025). Analisis komparatif kinerja keuangan dan risiko kebangkrutan perusahaan jasa konstruksi di Indonesia: Studi kasus perusahaan BUMN vs non-BUMN. *Jurnal Locus Penelitian dan Pengabdian*, 4(8), 7884–7902. <https://doi.org/10.58344/locus.v4i8.4155>
- Nastiti, P. K. Y., Atahau, A. D. R., & Supramono, S. (2019). Working capital management and its influence on profitability and sustainable growth. *Business: Theory and Practice*, 20, 61–68. <https://doi.org/10.3846/btp.2019.06>
- Nursita, M. (2021). Pengaruh laba akuntansi, arus kas operasi, arus kas investasi, arus kas pendanaan, dan ukuran perusahaan terhadap return saham. *Going Concern: Jurnal Riset Akuntansi*, 16(1), 1–15. <https://doi.org/10.32400/gc.16.1.32435.2021>
- Pangaribuan, D. P., Pohan, S., & Panggabean, U. T. U. (2023). Pengaruh perputaran piutang terhadap modal kerja pada UD Manalu. *Jumansi: Jurnal Ilmiah Manajemen dan Akuntansi Medan*, 5(1), 43–55. <https://doi.org/10.47709/jumansi.v5i1.2206>
- Petersen, M. A., & Rajan, R. G. (1997). Trade credit: Theories and evidence. *The Review of Financial Studies*, 10(3), 661–691. <https://doi.org/10.1093/rfs/10.3.661>
- Peti, M. A., Dekrita, Y. A., & Aek, K. R. (2023). Pengaruh arus kas aktivitas operasi terhadap likuiditas pada Kopdit Pintu Air Cabang Paga. *Jurnal Projemen UNIPA*, 10(2), 72–89. <https://doi.org/10.59603/projemen.v10i2.30>

- Putri, D. F. (2025). Pengaruh perputaran modal kerja, cash holding, dan ukuran perusahaan terhadap profitabilitas pada perusahaan sektor teknologi yang terdaftar di BEI periode 2020–2022. *Ekonomika45: Jurnal Ilmiah Manajemen, Ekonomi Bisnis, Kewirausahaan*, 12(2), 1145-1160. <https://doi.org/10.30640/ekonomika45.v12i2.4581>
- Ross, S. A. (1977). The determination of financial structure: The incentive-signalling approach. *The Bell Journal of Economics*, 8(1), 23-40. <https://doi.org/10.2307/3003485>
- Salim, M. N., & Maududy Ary, M. (2020). Determinants of liquidity and their effect on financial performance of construction services SOE companies. *Dinasti International Journal of Economics, Finance and Accounting*, 1(5), 905-915. <https://doi.org/10.38035/dijefa.v1i5.498>
- Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87(3), 355-374. <https://doi.org/10.2307/1882010>
- Sunardi, K., Cornelius, T., & Kumala, M. D. (2021). Pengaruh arus kas operasional, perputaran piutang, dan perputaran persediaan terhadap likuiditas perusahaan manufaktur yang terdaftar di BEI di tengah pandemi COVID-19. *Accounting Global Journal*, 5(1), 13-33. <https://doi.org/10.24176/agj.v5i1.5611>
- Tauringana, V., & Afrifa, G. A. (2013). The relative importance of working capital management and its components to SMEs' profitability. *Journal of Small Business and Enterprise Development*, 20(3), 453-469. <https://doi.org/10.1108/JSBED-12-2011-0029>
- Ukaegbu, B. (2014). The significance of working capital management in determining firm profitability: Evidence from developing economies in Africa. *Research in International Business and Finance*, 31, 1–16. <https://doi.org/10.1016/j.ribaf.2013.11.005>
- Vo, T. Q., & Ngo, N. C. (2023). Does working capital management matter? A comparative case between consumer goods firms and construction firms in Vietnam. *Cogent Business & Management*, 10(3), 2271543. <https://doi.org/10.1080/23311975.2023.2271543>
- Widyadana, A. S., & Seputro, D. N. D. (2025). Analisis arus kas operasional dan likuiditas jangka pendek (Studi kasus: Perusahaan ritel mainan di Surabaya). *Akademik: Jurnal Mahasiswa Ekonomi dan Bisnis*, 5(3), 1441-1450. <https://doi.org/10.37481/jmeh.v5i3.1521>