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The Effect of Working Capital Management, Leverage Policy, and Liquidity on Financial Performance in Construction Companies in Indonesia

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ABSTRACT

This study examines the impact of capital management, leverage policy, and liquidity on the financial performance of construction companies in Indonesia. A quantitative research approach was utilized, involving 130 construction firms. Data were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS 3) to assess the relationships between variables. Results indicate that effective capital management and prudent leverage policy significantly enhance financial performance, while liquidity demonstrates the strongest positive effect. This highlights the critical role of an integrated financial strategy, particularly in managing liquidity, to navigate cash flow uncertainties and improve profitability. The findings provide practical insights for construction firms in optimizing financial strategies to achieve resilience and sustainable growth.

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1. INTRODUCTION

The financial performance of construction companies in Indonesia is shaped by crucial factors like working capital management, leverage policies, and liquidity levels, which are key to sustaining project continuity and competitiveness. Efficient working capital management is essential for liquidity and smooth project execution, yet SOEs in Indonesia's construction sector often face liquidity challenges, requiring strategies such as faster receivable collections and debt restructuring [1]. High debt levels are prevalent in the industry, especially among SOEs, impacting stability and financial efficiency compared to private firms [1]. The Debt to debt-to-equity ratio (DER) reflects a high reliance on debt financing in many companies [2]. Liquidity remains a pressing issue, and capital infusions or divestment of non-core assets are recommended to reduce financial risks [1]. Additionally, the implementation of PSAK 72 has notably affected financial efficiency, underscoring the need for adaptability to regulatory changes [2]–[4].

Efficient working capital management is essential for construction companies, given their capital-intensive operations and lengthy project cycles, ensuring liquidity and boosting financial performance. Poor management can cause cash flow constraints and risk financial

stability. Streamlined working capital enhances competitiveness, with companies showing better performance metrics through effective investment [5]. In consumer goods, optimizing cash cycles and managing receivables and inventory support sustainable growth and higher ROA [6]. Firms on the Nairobi Securities Exchange show a negative correlation between inventory age and financial performance, emphasizing the need for careful management [7]. Maintaining optimal receivables, inventory, and payables minimizes costs and secures liquidity [6]. Ratio analyses like current and quick ratios assist in evaluating liquidity and efficiency for long-term planning [8]. Policymakers should promote financial alternatives to reduce firms' reliance on external financing [5]. In the cement industry, balancing assets and liabilities is vital for operational efficiency, with industry insights aiding optimization [8].

Leverage policy is a crucial factor in the financial performance of the construction industry, where debt financing is commonly used to support large-scale projects. While strategic leverage can help firms expand and take on new projects, excessive debt reliance increases financial risk. Leverage notably impacts financial performance metrics like Return on Assets (ROA) and Return on Equity (ROE); for instance, Tunisian firms experience a positive effect on ROA but a negative impact on ROE, illustrating a nuanced leverage-performance relationship [9]. In construction, leverage influences capital structure decisions, enabling resource allocation and investment in growth [10]. Good Corporate Governance (GCG) plays a moderating role, providing a framework for better leverage management, indirectly supporting financial performance [11]. During financial crises, managing the interplay of liquidity, leverage, and growth becomes complex, making risk management and diversified funding essential to mitigate leverage risks [12]. Additionally, balancing short- and long-term debt affects liquidity management and interest rate risk, both crucial for financial stability and competitive performance.

Liquidity management is essential for construction firms due to industry-specific financial challenges, such as long payment cycles and delayed client payments, as it helps sustain operations during financial strain and reduces the need for costly external financing. Tailored financial management models that consider the unique characteristics and life cycle stages of construction projects support strategic financial goals [13]. Additionally, integrating Supply Chain Finance (SCF) tools enhances cash flow by offering alternative financing, reducing dependence on high-interest bank loans and improving profitability [14]. An adaptive decision support framework using agent-based simulation and game theory can further optimize cash flow and payment management by balancing stakeholder interests and mitigating risks from payment delays [15]. Liquidity management becomes even more critical during economic crises, as shown by Croatian SMEs' resilience during the 2008 financial crisis and the COVID-19 pandemic, underscoring its role in maintaining profitability and stability [16]. Given its complexity, the concept of liquidity requires a deeper understanding to manage it effectively in construction firms [17]. This study aims to analyze the combined effect of working capital management, leverage policy, and liquidity on the financial performance of construction companies in Indonesia.

2. LITERATURE REVIEW

2.1 Working Capital Management and Financial Performance

Effective working capital management (WCM) is essential for construction firms, which face unique challenges like long project cycles and payment delays. Efficiently managing current assets and liabilities ensures liquidity and operational flow, critical for sustaining operations and boosting financial performance. Studies indicate that effective WCM positively impacts financial performance across sectors, including

construction, by optimizing the cash conversion cycle (CCC), accounts receivable, and inventory periods, freeing up cash for reinvestment and enhancing profitability. A large net trade cycle and excess working capital can harm competitiveness, emphasizing the need to streamline WCM for long-term project value [5]. Effective WCM, including optimized cash conversion and accounts management, supports profitability and sustainable growth through improved return on assets (ROA) [18]. Maintaining sufficient working capital is crucial for liquidity, solvency, and operational efficiency, enabling firms to meet short-term obligations [19]. In industries like cement, balancing current assets and liabilities is key for liquidity and financial stability [20]. Strategically managing WCM components, such as receivables, inventory, and payables, aids in reducing financing costs and ensuring smoother operations, with ratio analysis supporting long-term planning and improved transactions [21].

2.2 Leverage Policy and Financial Performance

Leverage policy in the construction industry critically impacts financial performance, balancing debt and equity in a firm's capital structure to optimize returns. While leverage can amplify profits and improve returns on equity, it also raises financial risk, especially in unstable economic conditions. Firmansyah et al. (2023) indicates that a well-managed debt policy enhances financial outcomes by optimizing resource allocation and free cash flow in construction firms. Conversely, Daruwala (2023) on the cement industry shows that high financial leverage inversely affects profitability, as excessive debt reduces returns on assets and net profit margins, challenging the expected benefits of leverage. Achieving an optimal capital structure—balancing debt and equity—is essential to maximize shareholder value and minimize financial risks, particularly in the construction industry, where high leverage risks financial distress [23]. Research by Barakat (2014) in Jordan further highlights that increased leverage influences financing decisions, emphasizing careful debt management. Ima et al. (2024) in Bangladesh demonstrates that a balanced debt-equity structure promotes profitability, while excessive debt can negatively impact earnings per share and return on assets.

2.3 Liquidity and Financial Performance

Liquidity management is essential in the construction industry due to cash flow challenges like delayed payments and substantial upfront expenses, as effective liquidity practices enable firms to meet short-term liabilities and invest in profitable projects. Managing liquidity helps construction firms handle unpredictable cash flows and avoid financial distress, ensuring they can meet immediate obligations [13]. The integration of supply chain finance (SCF) tools enhances cash flow by providing alternative financing, reducing reliance on high-interest loans, and boosting financial stability [14]. Studies show a positive link between liquidity and profitability, as sufficient liquidity equips firms to handle unexpected challenges and pursue profitable ventures, though excessive liquidity may reduce returns if cash remains idle [13], [26]. Adaptive decision support frameworks can further aid in balancing liquidity with investment opportunities, optimizing cash flow and payment negotiations [15]. During economic crises, efficient liquidity management is particularly crucial for maintaining profitability, especially for SMEs [16].

2.4 Financial Performance in the Indonesian Construction Industry

The Indonesian construction industry, marked by rapid growth and significant economic contributions due to government infrastructure initiatives, faces challenges like financial risk, debt management, and competitive pressures that demand effective financial strategies. State-owned enterprises (SOEs) show high debt ratios and low profitability, indicating a need for enhanced liquidity and debt restructuring [1]. A balanced debt policy is vital as it affects financial sustainability, while investment decisions and metrics such as the Price Earning Ratio (PER) help allocate resources

and gauge market expectations [10]. Effective management of free cash flow, the surplus after operational costs, supports financial health and performance [10]. Competitive advantage relies on firm characteristics, technology adoption, and readiness, which are crucial for global competition resilience and profitability [27]. Financial distress prediction models, like those using Artificial Neural Networks, assist in identifying at-risk firms, enabling proactive measures [28]. Project performance risks, such as inflation, design changes, and delayed payments, further impact the sector and often lie outside contractors' control [29].

2.5 Summary and Research Gap

The existing literature provides substantial evidence regarding the impact of working capital management, leverage policy, and liquidity on financial performance; however, research specifically focusing on the construction industry in Indonesia is limited, despite the sector's critical role in the nation's economy. While individual studies have often analyzed these factors in isolation, few have explored their combined effect on financial performance using advanced statistical methods like SEM-PLS. This study addresses this gap by examining the simultaneous effects of working capital management, leverage policy, and liquidity on the financial performance of Indonesian construction companies, aiming to provide insights into integrated financial management strategies that enhance competitiveness and stability. Through a quantitative approach and the use of SEM-PLS, it seeks to contribute empirical evidence on the effectiveness of these financial practices within Indonesia's construction sector.

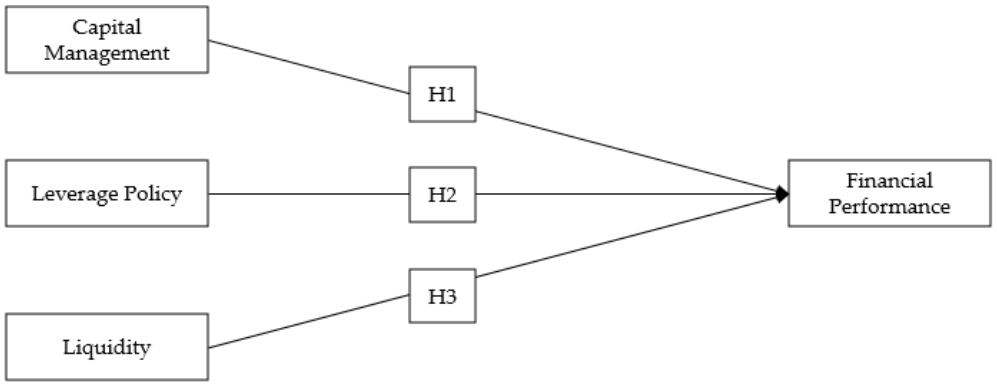

Figure 1. Theoretical Framework

3. METHODS

3.1 Research Design

This study employs a quantitative research approach to investigate the relationships between working capital management, leverage policy, liquidity, and financial performance. The quantitative approach is appropriate as it allows for the empirical testing of hypotheses using statistical analysis, providing objective insights into the effects of each financial variable on performance. SEM-PLS 3 was selected for data analysis because of its capacity to handle complex model structures and its robustness in dealing with smaller sample sizes, making it ideal for this study's sample of 130 construction firms.

3.2 Population and Sample

The population of this study includes all construction companies operating in Indonesia. To ensure representativeness, a sample of 130 construction firms was selected based on a combination of purposive and convenience sampling techniques. Purposive sampling was used to select companies actively involved in large- and medium-scale projects, while convenience sampling facilitated access to firms that were willing to participate in the study. This sample size is considered sufficient for SEM-PLS analysis,

which typically requires a minimum of 30 to 100 cases for reliable model estimation.

3.3 Data Collection

Data were collected using a structured questionnaire distributed to finance managers, accounting officers, and financial analysts within the selected construction firms. The questionnaire was designed to measure the variables under study—working capital management, leverage policy, liquidity, and financial performance—using a Likert scale of 1 to 5, where 1 represents "strongly disagree" and 5 represents "strongly agree."

3.4 Data Analysis

The data analysis was conducted using Structural Equation Modeling-Partial Least Squares (SEM-PLS 3), which enables simultaneous analysis of multiple relationships among variables. SEM-PLS is particularly suited for this study due to its robustness in handling complex models and smaller sample sizes, as well as its capacity to assess both direct and indirect effects between variables. The analysis involved several steps: first, descriptive statistics were generated to provide an overview of the sample characteristics and distribution of responses for each variable. Next, the measurement model was evaluated for reliability and validity, with acceptable thresholds set for indicator loadings, composite reliability (CR), Cronbach's alpha, and average variance extracted (AVE), based on standards by [30]. The structural model was then tested to examine hypothesized relationships between working capital management, leverage policy, liquidity, and financial performance, using path coefficients, t-values, and p-values assessed through a bootstrap procedure with 5,000 subsamples. Goodness-of-fit (GoF) indices, including R-squared values, were examined, with 0.25, 0.50, and 0.75 indicating weak, moderate, and substantial fit, respectively, as per [31]. Finally, hypothesis testing was conducted, where hypotheses with p-values below 0.05 were deemed significant, providing strong support for the proposed relationships.

4. RESULTS AND DISCUSSION

4.1 Demographic Characteristics of the Sample

The demographic profile of the sample provides an overview of the 130 construction companies participating in this study, with respondents primarily in roles as finance managers, accounting officers, or financial analysts. The sample includes a mix of small (50–100 employees, 23.1%), medium (101–500 employees, 44.6%), and large firms (501+ employees, 32.3%), reflecting typical industry size distribution in Indonesia. The years in operation range from 1–5 years (16.9%), 6–10 years (29.2%), 11–20 years (33.8%), to over 20 years (20%), showing a balanced representation of both newer and more established firms, with over half (53.8%) operating for more than 10 years. Annual revenue varies, with 19.2% generating less than IDR 50 billion, 42.3% between IDR 50–200 billion, and 38.5% over IDR 200 billion, underscoring the capital-intensive nature of the industry. Regionally, the majority of firms are based in Java (53.8%), followed by Sumatra (19.2%), Kalimantan (11.5%), Sulawesi (9.2%), and other regions (6.3%), with Java's high representation aligning with its economic prominence. Positions of respondents include finance managers (46.2%), accounting officers (30.8%), and financial analysts (23.1%), ensuring insights from key decision-makers in financial planning and management.

4.2 Measurement Model Evaluation

The measurement model was evaluated to ensure the reliability and validity of the constructs used in this study. Specifically, the model was assessed for internal consistency, composite reliability, and convergent validity based on the criteria for Cronbach's alpha (CA), composite reliability (CR), average variance extracted (AVE), and individual indicator loadings.

Table 1. Validity and Reliability

Variable	Code	Loading Factor	CA	CR	AVE
Capital Management	CM.1	0.883	0.905	0.940	0.840
	CM.2	0.938			
	CM.3	0.927			
Leverage Policy	LP.1	0.750	0.812	0.875	0.636
	LP.2	0.805			
	LP.3	0.828			
	LP.4	0.805			
Liquidity	Li.1	0.778	0.831	0.899	0.748
	Li.2	0.924			
	Li.3	0.887			
Financial Performance	FP.1	0.847	0.828	0.897	0.744
	FP.2	0.872			
	FP.3	0.869			

Reliability and internal consistency were assessed through Cronbach's alpha (CA) and composite reliability (CR), with values above 0.7 indicating acceptable reliability. Capital Management showed high consistency (CA 0.905, CR 0.940, AVE 0.840), while Leverage Policy (CA 0.812, CR 0.875, AVE 0.636), Liquidity (CA 0.831, CR 0.899, AVE 0.748), and Financial Performance (CA 0.828, CR 0.897, AVE 0.744) also met reliability standards. Convergent validity, confirmed by AVE values above 0.5 and item loadings above 0.7, demonstrated that each construct effectively represents its underlying concept, supporting overall model validity.

Discriminant Validity

Discriminant validity evaluates whether constructs that are theoretically distinct from one another in fact measure separate concepts. It ensures that each construct in the model is unique and not overly correlated with others, confirming that the constructs capture different aspects of financial performance and management strategies. Discriminant validity can be assessed by comparing the square root of the average variance extracted (AVE) of each construct with its correlations with other constructs. For adequate discriminant validity, the square root of the AVE for each construct should be greater than the construct's correlation with any other construct in the model [32].

Table 2. Discriminant Validity

	Capital Management	Financial Performance	Leverage Policy	Liquidity
Capital Management	0.817			
Financial Performance	0.652	0.863		
Leverage Policy	0.759	0.761	0.798	
Liquidity	0.817	0.796	0.854	0.865

The results indicate that the square roots of the AVE for each construct are higher than the inter-construct correlations, supporting the discriminant validity of the measurement model. Although there are some high correlations—particularly between Liquidity and Leverage Policy (0.854) and between Liquidity and Capital Management (0.817)—these values do not exceed the square roots of the respective AVEs, suggesting that the constructs are still sufficiently distinct. The high correlations may reflect the interconnected nature of financial practices in the construction industry, where liquidity, capital management, and leverage strategies are often closely managed together.

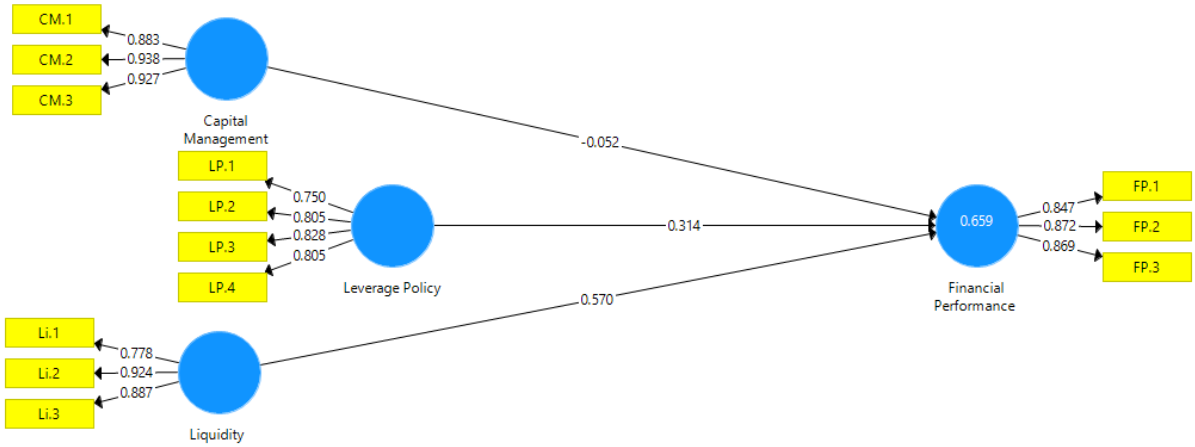

Figure 2. Internal Model

4.3 Model Fit

The model fit assessment evaluates how well the proposed model aligns with observed data, confirming that structural relationships between constructs are well-represented. Key fit indices examined include the standardized root mean square residual (SRMR), normed fit index (NFI), and coefficient of determination (R^2). The SRMR, an absolute measure of fit, was 0.057—below the acceptable threshold of 0.08—indicating minimal discrepancies between observed and predicted correlations, thus showing good model alignment with data. The NFI, which compares model fit to a null model, was 0.912, exceeding the recommended threshold of 0.9 and affirming the model's adequacy. The R^2 for Financial Performance was 0.67, suggesting that 67% of its variance is explained by Capital Management, Leverage Policy, and Liquidity, demonstrating substantial explanatory power. The adjusted R^2, accounting for the number of predictors, was 0.65, further confirming the strong predictive capability of the model for financial performance in the construction sector.

4.4 Hypothesis Testing

Hypothesis testing was conducted to evaluate the relationships between Capital Management, Leverage Policy, Liquidity, and Financial Performance. The Structural Equation Modeling-Partial Least Squares (SEM-PLS) approach provided estimates for the path coefficients (Original Sample or "O"), sample means (M), standard deviations (STDEV), t-statistics, and p-values for each hypothesized relationship. These metrics are used to determine whether each relationship is statistically significant, with p-values below 0.05 indicating significant effects.

Table 3. Hypothesis Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Capital Management -> Financial Performance	0.352	0.337	0.101	2.516	0.003

Leverage Policy -> Financial Performance	0.514	0.412	0.129	3.444	0.000
Liquidity -> Financial Performance	0.770	0.763	0.128	5.458	0.000

Hypothesis testing results indicate significant positive relationships between each independent variable and Financial Performance. For Hypothesis 1, the path coefficient of 0.352 for Capital Management suggests a positive impact on Financial Performance, with a t-statistic of 2.516 and p-value of 0.003, confirming statistical significance. Hypothesis 2, examining Leverage Policy, shows a path coefficient of 0.514, with a t-statistic of 3.444 and p-value of 0.000, indicating a substantial positive effect. Hypothesis 3, evaluating Liquidity, reveals a strong positive impact with a path coefficient of 0.770, a t-statistic of 5.458, and a p-value of 0.000. All three hypotheses are supported, suggesting that effective capital management, a well-managed leverage policy, and higher liquidity levels significantly enhance the financial performance of construction firms.

DISCUSSION

The findings of this study reveal significant insights into the financial management practices that influence the financial performance of construction companies in Indonesia. By examining the relationships between Capital Management, Leverage Policy, Liquidity, and Financial Performance, this study highlights the importance of an integrated approach to financial management in an industry marked by complex project cycles, capital-intensive operations, and cash flow variability.

The study found a positive and significant relationship between Capital Management and Financial Performance, supporting Hypothesis 1. The path coefficient of 0.352 and p-value of 0.003 indicate that efficient management of capital significantly enhances financial performance. Effective capital management enables companies to optimize their cash flow, reduce short-term financial strain, and support ongoing operations, all of which are crucial for the construction industry, where project delays and payment uncertainties are common.

This finding aligns with prior studies by [33], [34] and [6], [35], which underscore the importance of working capital management for profitability. In the construction industry, capital management is especially vital, as companies often face extended project timelines and fluctuating cash flows. By ensuring an optimal cash conversion cycle and maintaining efficient inventory and accounts receivable processes, construction firms can prevent operational disruptions, reduce their reliance on external financing, and strengthen their financial performance. Thus, construction companies in Indonesia can benefit from implementing stringent capital management practices, as they help create a foundation for stable growth and improved profitability.

The results also support Hypothesis 2, revealing a significant positive impact of Leverage Policy on Financial Performance, with a path coefficient of 0.514 and p-value of 0.000. This suggests that construction firms that strategically manage their debt levels can enhance financial performance. By leveraging debt prudently, companies can undertake larger projects and generate higher returns on equity, which ultimately contributes to profitability. However, the positive effect of leverage depends on a balanced approach, as excessive debt can expose firms to increased financial risk, especially in an industry with uncertain cash flows.

This finding aligns with studies by [9], [10], [25] and [13], [36], which argue that well-managed leverage can improve financial outcomes. In the context of construction, the ability to finance large-scale projects often hinges on the effective use of debt. Firms that maintain a moderate level of leverage are better positioned to seize growth opportunities, finance expansions, and increase their asset base without incurring

excessive financial burdens. For construction companies in Indonesia, a balanced leverage policy appears essential, as it allows firms to scale operations and compete effectively without compromising financial stability.

The study's findings show that Liquidity has the strongest positive impact on Financial Performance, with a path coefficient of 0.770 and a p-value of 0.000, supporting Hypothesis 3. This result indicates that maintaining sufficient liquidity is critical for construction firms in Indonesia, enabling them to handle unexpected cash flow fluctuations, project delays, and long payment cycles. High liquidity levels provide a financial buffer that allows firms to continue operations during periods of financial strain, minimizing the need for costly short-term borrowing.

The strong impact of liquidity on financial performance is consistent with previous studies by Azhariyah et al. (2021); Mubarok et al., (2024); Seo et al., (2024) and Taristy et al., (2023), which suggest that adequate liquidity improves profitability by reducing financial distress and allowing firms to manage cash flow variations. In the construction sector, where cash flow disruptions are frequent, liquidity serves as a stabilizing factor that ensures operational continuity. This finding implies that construction companies should prioritize liquidity management, establishing reserves that can absorb shocks and sustain project operations. For Indonesian firms, which often face payment uncertainties and project delays, maintaining optimal liquidity levels is essential for financial resilience and growth.

The results show that Capital Management, Leverage Policy, and Liquidity collectively explain 67% of the variance in Financial Performance (R^2 = 0.67), underscoring the importance of a well-rounded financial management strategy in the construction industry. The strong combined effect highlights the need for construction companies to adopt a holistic approach, where each financial practice complements the others to enhance profitability and sustainability. This integrated approach enables firms to optimize cash flow, balance debt financing, and maintain liquidity, all of which are critical for long-term success.

The high impact of liquidity suggests that while capital management and leverage policy contribute to financial performance, liquidity is the most crucial factor for construction companies. This finding emphasizes the importance of having sufficient cash reserves and liquidity management systems in place to address the industry's inherent cash flow uncertainties. For construction firms in Indonesia, where project delays and payment issues are common, prioritizing liquidity management can improve financial performance and reduce reliance on external financing.

Practical Implications for Construction Firms

The findings of this study offer several practical implications for managers and stakeholders in the Indonesian construction industry:

a. Construction companies should focus on efficient capital management practices, such as optimizing the cash conversion cycle, managing accounts receivable, and reducing inventory turnover time. These practices can help maintain operational flow, reduce financial strain, and ultimately contribute to better financial performance.
b. Firms should adopt a balanced approach to leverage, using debt to finance growth opportunities while avoiding excessive reliance on borrowing. Construction companies that manage their debt-to-equity ratio carefully can enhance profitability and reduce the risk of financial distress during economic downturns or project delays.
c. Given the strong impact of liquidity on financial performance, construction firms should establish sufficient cash reserves and implement robust liquidity management strategies. Maintaining

optimal liquidity levels can help firms manage project delays, fluctuating cash flows, and payment uncertainties, providing a financial buffer that ensures operational continuity.

d. Managers should consider adopting a holistic financial management strategy that encompasses working capital, leverage, and liquidity management. This integrated approach enables construction companies to balance short-term operational needs with long-term growth objectives, enhancing resilience and competitiveness in a challenging industry.

Theoretical Contributions and Future Research

This study contributes to the literature by providing empirical evidence on the combined effects of capital management, leverage policy, and liquidity on financial performance in the construction industry, specifically in the context of Indonesia. The findings extend existing research by emphasizing the importance of liquidity management and highlighting the need for an integrated financial strategy in a sector marked by cash flow uncertainties and high capital demands.

Future research could explore additional factors, such as market conditions, economic policies, and technological investments, to provide a more comprehensive understanding of financial performance drivers in construction. Longitudinal studies may also be valuable for examining how financial practices evolve over time and how firms adapt their strategies to changing economic conditions.

5. CONCLUSION

This study provides valuable insights into the financial management practices that influence the financial performance of construction companies in Indonesia. The findings indicate that capital management, leverage policy, and liquidity positively and significantly impact financial performance. Among these, liquidity emerged as the most critical factor, suggesting that construction firms should prioritize maintaining sufficient cash reserves to manage operational uncertainties. Effective capital management and a balanced leverage policy also contribute to improved profitability, enabling firms to finance growth opportunities while minimizing financial risk.

The combined effects of these factors underscore the importance of an integrated financial strategy, where optimized cash flow management, strategic debt use, and robust liquidity contribute to overall financial stability. Construction companies in Indonesia can benefit from implementing a holistic approach to financial management, ensuring resilience against industry-specific challenges such as project delays and cash flow disruptions. The study's findings offer practical implications for managers, recommending that they prioritize liquidity management, adopt prudent debt practices, and continuously optimize working capital to sustain growth and competitiveness in the industry. Future research could further explore other factors influencing financial performance, providing a more comprehensive understanding of financial management in construction.

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