Journal of Applied Sciences in Accounting, Finance and Tax
Volume 8 Issue 1 (April 2025), p. 26-40
e-issn 2655-2590 © Politeknik Negeri Bali
https://ojs2.pnb.ac.id/index.php/JASAFINT

Capital efficiency and organizational performance: A dynamic panel analysis of Weighted Average Cost of Capital (WACC) and ROA in Indonesia's healthcare sector

Ulfa Arofah[1]✉, Muhammad Saiful Hakim[2] & Muhammad Alfarizi[3]

[1,2,3] Department of Business Management, Faculty of Creative Design and Digital Business, Institut Teknologi Sepuluh November, Surabaya, Indonesia
✉ Address correspondence: Jl. Arief Rahman Hakim, Sukolilo, Surabaya, 60111, Indonesia
E-mail: 6031241026@student.its.ac.id

ABSTRACT
The healthcare sector in Indonesia faces challenges in managing capital efficiency and organizational performance due to high operational costs and the need for continuous investment in health technology and infrastructure. As a key driver of economic growth, especially post-COVID-19, optimal capital management is crucial for sustaining operations and creating stakeholder value. This study examines the relationship between the Weighted Average Cost of Capital (WACC) and Return on Assets (ROA) in Indonesia's healthcare sector using a quantitative dynamic panel analysis approach. Financial data from healthcare companies listed on the Indonesia Stock Exchange were analyzed using the Generalized Method of Moments (GMM). The findings indicate that WACC negatively affects ROA, but the relationship is not statistically significant. Leverage, measured through the Debt to Asset Ratio and Debt to Equity Ratio, strengthens this relationship positively. Meanwhile, cash holdings and firm size have a negative moderating effect, whereas Net Working Capital (NWC) reinforces the relationship positively. These results highlight the importance of effective debt and liquidity management in optimizing profitability in the healthcare sector. The study contributes theoretically to capital efficiency discussions and offers practical insights for industry stakeholders, including decision-makers and investors. The research is novel in its focus on Indonesia's healthcare sector, making it highly relevant for financial and strategic planning in the industry.

Keywords: capital efficiency, healthcare sector, leverage, return on assets, weighted average cost of capital

1. Introduction

The health sector has a strategic role in the economy, especially amidst the increasing need for quality health services. Not only responsible for maintaining individual welfare, this sector is also a driving force for economic growth through job creation, technological innovation, and contributions to national productivity [1]. In the era of globalization, the demand for better health services is increasing, along with demographic changes, the COVID-19 pandemic, and lifestyles that have an impact on the increasing prevalence of catastrophic diseases [2].

In response to disruptions and delays in health services due to complex geopolitical and epidemiological issues, health policymakers are beginning to consider changes in delivery and cost structures. According to the World Health Organization (WHO), health spending is growing faster than global economic growth, accounting for up to 10% of global gross domestic product (GDP) [3]. This trend is even more striking in low- and middle-income countries, where health spending is increasing by an average of 6% per year, compared with 4% in high-income countries [4]. The health sector in Indonesia is one of the fastest-growing industries. According to data from the Central Statistics Agency (BPS) in 2020-2021 after COVID-19, revenue from the health sector has increased substantially [5] [6].

Indonesia's healthcare sector faces a complex set of financial challenges. First, high operational costs are a major problem as medical infrastructure tends to be expensive to build and maintain [7]. Furthermore, the insufficiency of private funds is also a sensitive issue. Donors and sponsors are often difficult to secure, so the reliability of additional resources is compromised [8]. This is reflected in donor programs that are sometimes unstable and rely on spontaneous donations. Furthermore, the high cost of medicines is another barrier. Some patented medicines that are only produced by multinational pharmaceutical companies make the cost of treatment very high so that not all people can access them [9]. This has prompted discussions about fairer and more inclusive drug pricing policies. Finally, demographic and epidemiological changes also affect the allocation of funds. The rise in the aging population and the increase in cases of chronic diseases require specific management strategies that require additional investment [10].

A literature review of the financial condition of the health sector in Indonesia shows that this sector has experienced significant growth, especially during the COVID-19 pandemic. Although many other sectors have slumped, the health sector has become a target for investors, both local and foreign, due to the increasing demand for health services and medical products [11]. Research shows that financial ratios such as debt-to-asset ratio and current ratio have a positive influence on the stock prices of companies in this sector [12], [13], [14], while return on equity does not have a significant effect [13], [15]. This indicates that healthcare companies can maintain stable financial performance even in times of crisis. The performance of healthcare sector stocks also shows higher returns compared to other stock indices, reflecting the attractiveness and potential for strong growth in the long term [16].

In the increasingly complex economic challenges, capital efficiency and organizational performance in this sector are crucial aspects to ensure operational sustainability and positive contributions to national economic growth. Capital is one of the main elements in organizational operations, including in the health sector [17]. The efficiency of capital use can be measured through various indicators, one of which is the Weighted Average Cost of Capital (WACC). WACC reflects the weighted average cost of financing sources used by the organization, both from equity and debt [18]. Efficiency in managing WACC has the potential to increase the company's value and have a positive impact on the overall performance of the organization. On the other hand, Return on Assets (ROA) is often used as a primary indicator to measure the financial performance of an organization, especially in evaluating the effectiveness of asset usage to generate profits [19].

The dynamics of the health sector in Indonesia present their challenges. As a capital-intensive sector, health companies often face a dilemma in choosing the optimal capital structure to support the growth and development of health services [20]. In addition,

dependence on certain sources of financing, such as debt or equity, has significant implications for the cost of capital that the Company must bear [21]. It is important to understand how capital efficiency as measured by WACC affects the financial performance of an organization as represented by ROA.

Several previous studies have discussed the relationship between capital structure, capital cost efficiency, and organizational performance across sectors. One study found that capital structure can improve company performance for small and medium enterprises [22], [23]. Other studies reveal a significant non-monotonic relationship between capital structure and firm performance, with positive performance at low debt levels but negative at higher debt levels [24]. In addition, a meta-analytic study confirmed a negative relationship between firm performance and capital decisions, which is in line with the trade-off model with agency costs and the pecking order theory [25]. Firms with higher relative efficiency are expected to pay a lower cost of capital, indicating a negative relationship between WACC and relative firm efficiency [26]. WACC can be used as a benchmark for capital structure optimization, indicating that it has a significant effect on the cost of capital.

In the issue of health sector finance, technical efficiency had a positive impact on cost efficiency, indicating that optimizing resource use can result in better financial outcomes [27]. This highlights the importance of efficient use of capital in healthcare settings. The relationship between intellectual capital and healthcare organizational performance in the Italian healthcare system suggests that several IC components influence organizational performance and can be used to define resource allocation policies in the healthcare sector [28].

The research gap in previous literature shows that although there are many studies discussing the relationship between capital structure, cost of capital, and company performance in various sectors, there are still limitations in examining the relationship specifically in the health sector of developing countries such as Indonesia. Several studies have identified the relationship between capital cost efficiency and company performance in other sectors, but there has been no in-depth study of how capital efficiency, as measured by WACC, affects organizational performance in the health sector, especially in dynamic conditions influenced by external factors such as pandemics and demographic changes. Most studies tend to focus on the industrial or manufacturing sectors that have different characteristics from the health sector, both in terms of cost structure and operational dynamics. In addition, changes in government regulations and policies in the Indonesian health sector, such as the implementation of the National Health Insurance (JKN), also affect the financing structure and capital efficiency of organizations. This condition creates a need to understand how organizations in the health sector adjust their financing and operational strategies to improve capital efficiency and maintain optimal performance. Based on the gaps and urgency, there are several research questions that need to be studied further:

RQ1. How does the Weighted Average Cost of Capital (WACC) affect Return On Assets (ROA) in the Indonesian healthcare sector?

RQ2. What factors moderate the relationship between the Weighted Average Cost of Capital (WACC) and Return on Assets (ROA) of the Indonesian health sector?

This study aims to analyze the effect of Weighted Average Cost of Capital (WACC) on Return on Assets (ROA) in the healthcare sector in Indonesia. Specifically, this study also seeks to explore factors that can moderate the relationship between WACC and ROA. Through a dynamic panel analysis approach, this study provides a relevant framework for evaluating capital efficiency and its implications for organizational performance in the context of a dynamic healthcare sector influenced by other determinants.

2. Method

This study uses a quantitative design with a dynamic panel analysis approach, which allows the evaluation of the causal relationship between the Weighted Average Cost of Capital (WACC) and Return on Assets (ROA) in the health sector in Indonesia. This approach was chosen to

capture the temporal nature and heterogeneity of data between companies, as well as consider the possibility of endogeneity in the research model. The data used are secondary, and sourced from the annual reports of health sector companies listed on the Indonesia Stock Exchange (IDX) in the observation period for the last five years.

Variable measurements are conducted to understand the relationship between Weighted Average Cost of Capital (WACC) and Return on Assets (ROA), as well as the role of moderator variables that can strengthen or weaken the relationship. The variables measured include dependent, independent, moderator, and control variables. The determination of measurement indicators is based on previous literature and empirical practices in the field of corporate finance [18], [19], [29], [30], [31], [32], [33], [34], [35]. The measurement of these variables aims to accurately reflect organizational performance and capital efficiency, especially in healthcare sector companies. In addition, the measurement method ensures compliance with the characteristics of the available data, such as annual reports and financial databases. The selection of moderator variables is carried out to enrich the analysis and dig deeper into the factors that influence the main relationships, thus providing a more comprehensive insight into the dynamics of capital efficiency in the healthcare sector.

In this study, the dependent variable used is Return on Assets (ROA), which measures the company's financial performance in using its assets to generate profits. ROA reflects the company's efficiency in utilizing its resources to create profits. Mathematically, ROA is calculated by dividing net income by total assets and expressed as a percentage, [36] as follows:

$$ROA = \frac{Net\ Income}{Total\ Assets}\ x\ 100\%$$

The higher the ROA value, the better the company's performance in generating profits from its assets. In the context of the health sector, ROA is an important indicator considering the characteristics of this sector which is capital-intensive with high operating costs.

The independent variable that is the main focus is the Weighted Average Cost of Capital (WACC), which measures the weighted average of the company's cost of capital from equity and debt. WACC reflects the minimum rate of return that a company must generate to satisfy investors and creditors. The formula for calculating WACC is [37]:

$$WACC = \left(\frac{E}{V} \times R_e\right) + \left(\frac{D}{V} \times R_d \times (1 - T)\right)$$

A lower WACC indicates that the company can obtain capital at a more efficient cost, while a high WACC can burden profitability due to high financing costs. In this study, the relationship between WACC and ROA is analyzed to see how capital cost efficiency affects financial performance. The unique nature of the healthcare sector, which has a complex cost structure and is dependent on technological innovation, makes WACC a strategic indicator in managing capital and optimizing company value.

Moderator variables in this study are used to identify factors that can strengthen or weaken the relationship between WACC and ROA. The four moderating variables considered are cash holding, leverage, firm size, and NWC. Cash holding refers to the amount of cash held by a firm as a percentage of total assets, indicating the firm's liquidity in facing operational and investment needs. Leverage reflects the proportion of debt to equity, indicating the level of risk and cost burden borne by the firm in financing. Firm size, measured by the natural logarithm of total assets, describes the scale of the firm's operations and its ability to manage capital efficiently. Meanwhile, NWC, calculated as the difference between current assets and current liabilities to total assets, represents the efficiency of the firm's working capital management.

The population in this study includes all health sector companies listed on the Indonesia Stock Exchange (IDX) up to the observation period, with a total of 34 companies based on

available data. These companies consist of various sub-sectors, including pharmaceuticals, hospitals, medical laboratories, and other health services. This population was selected because the health sector in Indonesia plays a strategic role in supporting the national economy and facing complex financial challenges. To determine the research sample, a purposive sampling method was used with the following inclusion criteria: (1) the company must be listed on the main listing board of the Indonesia Stock Exchange, which reflects higher performance stability and transparency compared to the development board; (2) the company has complete financial reports during the observation period; and (3) relevant data to calculate the research variables (WACC, ROA, and moderators) are consistently available. Based on these criteria, 13 companies were selected as research samples according to Tables 1-6. The selected samples include large companies such as Kalbe Farma Tbk. (KLBF), Mitra Keluarga Karyasehat Tbk. (MIKA), and Medikaloka Hermina Tbk. (HEAL), which represents the main sub-sectors in the health industry. This selection aims to ensure that the analysis reflects the financial dynamics of significant and relevant companies in the Indonesian healthcare sector.

In this study, the data used are secondary and taken from two main sources, namely the Indonesia Stock Exchange (IDX) and the publication of annual financial reports of companies listed in the health sector. The data collected covers the period 2021 to 2023. First, data on companies listed in the health sector were taken from the Indonesia Stock Exchange (IDX), which provides information on stock prices, equity data, and relevant market information. This data is used to measure variables such as Weighted Average Cost of Capital (WACC) and information related to the company's capital structure. Second, the annual financial reports of health sector companies available on each company's website are used to obtain information on financial performance, including Return on Assets (ROA), cost of debt, equity, and other related information.

In this study, data analysis techniques were carried out through several stages to ensure the validity and reliability of the results. First, descriptive statistical analysis was carried out to describe the characteristics of the data collected. These descriptive statistics include calculating the average, median, standard deviation, and range of values for key variables such as WACC, ROA, and moderating variables (such as cash holding, leverage, and company size). The purpose of this stage is to provide an overview of the distribution and trends of the data.
Next, a classical assumption test is carried out to ensure that the data meets the regression requirements, including a multicollinearity test to detect the presence of a linear relationship between independent variables, a heteroscedasticity test to evaluate the diversity of error variances, and an autocorrelation test to identify the presence of a relationship between errors in panel data [38].

To analyze the dynamic relationship between WACC and ROA, dynamic panel analysis was used with the Generalized Method of Moments (GMM) Arellano-Bond method [39]. This method is chosen to overcome the endogeneity problem and identify the long-term influence between WACC and ROA. This model also allows to explore the moderating influence of factors such as cash holding, leverage, and company size on the relationship.
The estimation model for this study can be explained as follows [36]:

$$ROA_{it} = \alpha + \beta_1 WACC_{it} + \beta_2 MOD_{it} + \gamma X_{it} + \in_{it}$$

Information:

- ROA_{it} = Return on Assets of company iii in year ttt
- $WACC_{it}$ = Weig Weighted Average Cost of Capital of company iii in year ttt
- MOD_{it}= Moderator variables including cash holding, leverage, and company size
- X_{it} = Control for other relevant variables
- $\in_{it}$= Error term
- α dan β = parameters to be estimated

Journal of Applied Studies in Accounting, Finance and Tax
Volume 8 Issue 1 (April, 2025), pp. 26-40
e-issn 2655-2590 © Politeknik Negeri Bali
https://ojs2.pnb.ac.id/index.php/JASAFINT

By using the Arellano-Bond GMM model, this model can handle the endogeneity problem between WACC and ROA that often appears in panel data analysis, and overcome the dependency between variables over time. The use of this model is expected to provide a better understanding of how capital efficiency as measured by WACC affects organizational performance (ROA), as well as how moderating variables affect the relationship.

3. Results and Discussion

Panel Regression Models and Descriptive Statistics

Simple linear regression analysis is a statistical method used to model the relationship between one independent variable (predictor) and one dependent variable (outcome). In financial research, simple linear regression is often used to test relationships such as the impact of WACC on ROA. The results provide insight into the statistical significance and strength of the relationship between variables.

Table 1. WACC and ROA Simple Linear Regression Test Results

Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.548[a]	.300	.237	.04975

a. Predictors: (Constant), WACC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.208	.024		8.761	.000
	WACC	-.414	.191	-.548	-2.173	.053

a. Dependent Variable: ROA

Source: SPSS 25 Calculation

Based on Table 1 explains the simple linear regression analysis which produces a value of a (Constant) of 0.208, while the regression coefficient value is -0.414. These results can be concluded that WACC has a negative effect on ROA in health sector companies in Indonesia. The sig. value of 0.053 is greater than the significance value of 0.05 so it can be interpreted that WACC has a negative but insignificant effect on ROA. The R^2 (R Square) value produces a value of 0.300 which means that WACC affects ROA by 30% while other percentages can be influenced by other variables.

The interpretation of this analysis explains that when WACC (Weighted Cost of Capital) decreases, ROA (Return on Assets) will increase because it has a negative relationship. This means that when the capital structure or low costs can affect profitability, this indicates that the company is more efficient and profitable, so it can attract more investors in the health sector.

Univariate Analysis

Univariate analysis is a data analysis method that focuses on a single variable to understand the distribution, characteristics, and patterns of the data [40]. In financial research, it is often used to describe metrics such as stock returns, volatility, or financial ratios. The technique involves descriptive statistics such as mean, median, standard deviation, skewness, and kurtosis, as well as visualizations such as histograms and boxplots. Univariate analysis helps identify outliers, historical trends, and data distributions, which are important first steps before further analysis. The first analysis was conducted on variable X (WACC) and variable Y (ROA), the method used was simple linear regression which explained that WACC had a negative but insignificant effect on ROA. The first hypothesis cannot be accepted, because the first hypothesis stated that there was a significant effect while the research results stated that there was a negative but insignificant effect of WACC on ROA. This result is proven by the regression coefficient value

of -0.414 and sig. 0.053. The conclusion of this analysis is that when WACC or cost of capital decreases, what will happen is an increase in profitability or ROA because when the cost of capital is low, the Company's profitability automatically increases. The results of this study are supported by the statement that higher cost of capital has a negative impact on profitability [41].

Table 2. Simple Linear Regression Test Results Cash Holding

Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.741[a]	.550	.400	.05839

a. Predictors: (Constant), WACC*CASH HOLDING, WACC, CASH HOLDING

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.028	.143		.199	.847
	WACC	.116	.888	.087	.130	.899
	CASH HOLDING	1.092	.876	1.451	1.247	.244
	WACC*CASH HOLDING	-4.883	5.681	-1.040	-.859	.412

a. Dependent Variable: ROA

Source: SPSS 25 Calculation

The second analysis was conducted with variable X (WACC), moderation variable (Cash Holding), and variable Y (ROA). Based on Table 2, explains that the R^2 value is 0.550 which means that Cash Holding strengthens the relationship between WACC and ROA by 55%, this result is supported by the increase in R Square from Table 1 to Table 2. This analysis also produces a Cash Holding moderation regression coefficient value of -4.883, this value explains that Cash Holding moderates the relationship between WACC and ROA in the Indonesian Health sector negatively.

The interpretation of this analysis explains that when Cash Holding increases, WACC will decrease and ROA will increase. The explanation is that when cash and cash equivalents increase, profitability will increase while the cost of capital will decrease due to an increase in ROA. These results are supported by previous which found that companies with higher liquidity ratios tend to have lower costs of capital due to lower risk perceptions among investors and creditors [42].

Table 3. DAR Simple Linear Regression Test Results

Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.918[a]	.842	.790	.03458

a. Predictors: (Constant), WACC*DAR, DAR, WACC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.116	.079		-1.463	.178
	WACC	2.312	.853	1.746	2.709	.024
	DAR	-1.018	.301	-2.115	-3.383	.008
	WACC*DAR	5.147	.927	.925	5.550	.000

a. Dependent Variable: ROA

Source: SPSS 25 Calculation

The third analysis was conducted with variable X (WACC), moderation variable (DAR), and variable Y (ROA). Based on Table 3, explains that the R^2 value is 0.842 which means that DAR strengthens the relationship between WACC and ROA by 84%, this result is supported by the increase in R Square from Table 2 to Table 3. This analysis also produces a DAR moderation regression coefficient value of 5.147, this value explains that DAR moderates the relationship between WACC and ROA of the Indonesian Health sector positively.

The interpretation of this analysis is that the DAR variable strengthens the relationship between WACC and ROA, which means that when DAR is high or when the company uses more debt to finance the company, the WACC cost of capital will increase. The positive relationship between DAR and WACC indicates that there is a maximum limit to the use of debt, where at a certain level an increase in debt actually increases the overall cost of capital. While the positive relationship between DAR and ROA indicates that the company is able to utilize debt effectively to increase asset productivity and create value.

Table 4. DER Simple Linier Regression Test Results

Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.799[a]	.639	.518	.05232

a. Predictors: (Constant), WACC*DER, WACC, DER

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.606	.232		2.612	.028
	WACC	-4.739	2.097	-3.580	-2.260	.050
	DER	.493	.255	3.058	1.929	.086
	WACC*DER	2.202	.884	.508	2.491	.034

a. Dependent Variable: ROA

Source: SPSS 25 Calculation

The fourth analysis was conducted with variable X (WACC), moderation variable (DER), and variable Y (ROA). Based on Table 4, explains that the R^2 value is 0.639 which means that DER strengthens the relationship between WACC and ROA by 63.9%, this result is supported by the increase in R Square from Table 2 to Table 4. This analysis also produces a DER moderation regression coefficient value of 2.202, this value explains that DER moderates the relationship between WACC and ROA in the Indonesian Health sector positively.

The interpretation of this analysis is that the higher the DER, the greater the proportion of debt compared to equity in the company's capital structure. This positive relationship indicates that an increase in DER (higher debt) causes an increase in WACC. The positive relationship between DER and ROA indicates that when DER increases, ROA also increases, which means that the company is able to use debt effectively to generate profits from its assets. In other words, debt provides a higher return than the costs it incurs.

Based on the results of simple linear regression analysis, DAR and DER have a relationship with WACC and ROA. DAR and DER are a unit of Leverage, so it can be concluded that Leverage moderates the relationship between WACC and ROA in the Indonesian Health sector positively.

Table 5. Simple Linear Regression Test Results for Company Size

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.562[a]	.316	.088	.07198

a. Predictors: (Constant), WACC*In (Total Aset), In (Total Aset), WACC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.451	1.706		-.264	.798
	WACC	1.431	7.856	1.081	.182	.860
	In (Total Aset)	.023	.059	.277	.394	.703
	WACC*In (Total Aset)	-.075	.272	-1.640	-.275	.790

a. Dependent Variable: ROA

Source: SPSS 25 Calculation

The fifth analysis was conducted with variable X (WACC), the moderating variable of company size, and variable Y (ROA). Based on Table 5, explains that the R^2 value is 0.316 which means that company size strengthens the relationship between WACC and ROA by 31.6%, this result is supported by the increase in R Square from Table 2 to Table 5. This analysis also produces a company size moderation regression coefficient value of -0.075, this value explains that company size moderates the relationship between WACC and ROA of the Indonesian Health sector negatively.

The interpretation of this analysis is to explain that the existence of a company value based on assets will be able to strengthen the relationship between WACC and ROA. Basically, when the WACC value decreases, what happens is that the company value increases because profitability increases, the more efficient the company is in generating profits from its assets, the more the company value will increase. This condition can increase the market perception of the company.

Table 6. Simple Linear Regression Test Results Net Working Capital

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.741[a]	.548	.398	.05848

a. Predictors: (Constant), WACC*NWC, WACC, NWC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.318	.104		3.047	.014
	WACC	-1.280	.688	-.967	-1.861	.096
	NWC	-.010	.005	-1.668	-1.963	.081
	WACC*NWC	.043	.028	1.736	1.522	.162

a. Dependent Variable: ROA

Source: SPSS 25 Calculation

The sixth analysis was conducted with variable X (WACC), Net Working Capital moderation variable, and Y variable (ROA). Based on Table 6, explains that the R^2 value is 0.548 which means that Net Working Capital strengthens the relationship between WACC and ROA by 54.8%, this result is supported by the increase in R Square from Table 2 to Table 6. This analysis also produces a Net Working Capital moderation regression coefficient value of 0.043, this value explains that Net Working Capital moderates the relationship between WACC and ROA of the Indonesian Health sector positively.

The interpretation of this analysis is to explain that with the existence of Net Working Capital it will be able to strengthen the relationship between WACC and ROA. The explanation is that when NWC increases, this can reduce the negative impact of high WACC on ROA. For example, when a company has sufficient or good NWC (good liquidity), it is able to manage capital costs more efficiently, so that it can ultimately increase ROA. So, it can be concluded that Net Working Capital moderates the relationship between WACC and ROA in the Indonesian Health sector positively.

Discussion

The health sector in Indonesia plays a strategic role in supporting economic and social development. However, this sector faces major challenges, such as high capital requirements for technological innovation, operational efficiency, and service sustainability. In this context, capital cost efficiency is a crucial aspect of increasing the profitability of health sector companies. Weighted Average Cost of Capital (WACC) is the main indicator to measure this efficiency, because it reflects the average cost of capital borne by the company to fund its operations.

As a capital-intensive sector, healthcare companies in Indonesia must be able to optimize capital in order to create long-term value. However, there have been few studies that specifically explore the relationship between WACC and the profitability of companies in this sector, especially with Return on Assets (ROA) as a proxy for financial performance. In addition, the dynamics of this relationship can be influenced by various moderating factors, such as cash holding, leverage, company size, and working capital efficiency, which can strengthen or weaken the effect of WACC on ROA. Thus, this study aims to examine in depth the relationship between WACC and ROA, as well as the role of moderating variables in the context of the healthcare sector in Indonesia. This study is expected to provide practical and academic contributions to support strategic decision-making in the financial management of healthcare sector companies.

This study shows that WACC has an effect on ROA in the Indonesian health sector. Other variables that support the relationship between WACC and ROA are leverage (DAR and DER), which have a significant role in moderating the relationship between WACC and ROA, with both increasing the effectiveness of debt use to increase profitability. On the other hand, Company Size or company value is not proven to have a significant effect and has a negative relationship with other variables Cash Holding also has a negative relationship to WACC and ROA, while Net Working Capital shows a more complex relationship in moderating the effect of capital costs on profitability. These results highlight the importance of effective debt management and good liquidity in maximizing profitability in the Indonesian health sector.

The results of the analysis show that the effect of Weighted Average Cost of Capital (WACC) on Return on Assets (ROA) is negative but not significant. This result is evidenced by the regression coefficient value of -0.414 and sig. 0.053. This condition can be caused by several factors. First, the capital cost structure in the health sector often has high complexity, with varying proportions of debt and equity between companies. This creates uneven impacts of WACC on profitability. Second, the health sector has a large dependence on fixed assets and long-term investments, so the efficiency of capital costs only has a real impact over a longer period. Third, the influence of external factors, such as government regulations and market dynamics, can also reduce the sensitivity of ROA to changes in WACC.

The results of the analysis show that Cash Holding negatively moderates the relationship between the Weighted Average Cost of Capital (WACC) and Return on Assets (ROA). This result is evidenced by the cash-holding moderation regression coefficient value of -4.883. In other words, increasing Cash Holding weakens the effect of WACC on ROA. This phenomenon can be explained through the perspective of liquidity and risk perception. When a company has large cash reserves, the financial risk decreases because the company is better able to meet short-term obligations and handle unexpected situations. This makes investors and creditors

view the company as a more stable entity, thus lowering the cost of capital. The negative moderating effect shows that excessive cash reserves also have the potential to weaken capital efficiency. Resources that are not optimally utilized can create "idle funds," which suppress potential returns. Thus, although high liquidity reduces WACC, its impact on ROA is non-linear. Increasing ROA requires strategic cash-holding management, such as investing excess cash into projects that generate high-added value. In practice, healthcare companies need to balance liquidity to avoid the risk of cash shortages but also ensure that the funds are used productively. Steps such as allocating cash for innovation, product development, or expansion can increase profitability without increasing risk perception among stakeholders.

The next accepted hypothesis shows that DAR has a significant role as a moderating variable in the relationship between WACC and ROA. This result is evidenced by the R^2 value of 0.842 which means that DAR strengthens the relationship between WACC and ROA by 84.2%, and the DAR moderation regression coefficient value of 5.147. Practically, these results reflect that the company's funding structure, especially the proportion of debt in asset financing, has a significant impact on the company's financial performance. When DAR is high, companies tend to use more debt in their operations. This can increase WACC, because the cost of debt is one of the main components in the capital cost structure. However, the results of the analysis also show that at a certain level, effective use of debt can increase ROA. In other words, companies that are able to utilize debt to support the productivity of their assets can generate greater profits, even though they face higher capital costs. This relationship also indicates an optimal limit in the use of debt. When the company exceeds this limit, increasing debt will actually increase financial risk and suppress operational efficiency, which can ultimately reduce ROA. Therefore, the results of this study provide important insights for financial managers in designing a balanced and strategic capital structure. Careful debt management can have a positive impact on company performance without endangering its financial stability. Overall, this accepted hypothesis underlines the importance of wise debt management and optimal use of capital to create added value for companies, especially in the healthcare sector in Indonesia.

The next accepted hypothesis confirms that DER has an important role in moderating the relationship between WACC and ROA. This result is evidenced by the R^2 value of 0.639, which means that DER strengthens the relationship between WACC and ROA by 63.9% and the DER moderation regression coefficient value of 2.202. So, this result shows that the company's funding structure, especially the balance between debt and equity, significantly affects the company's financial performance. When DER increases, the company uses more debt relative to its capital. This increase implies an increase in WACC because debt has costs that must be paid, both in the form of interest and financial risk. However, the analysis also shows that at a certain level of DER, debt can be an effective tool to increase ROA. This occurs when the company can use debt to fund productive assets that provide greater profits than the cost of the debt itself. The positive relationship between DER and ROA reflects the company's ability to manage leverage wisely. This strategy signals that debt if managed properly, can be a leveraging tool to increase asset efficiency and create added value. However, as with DAR, the use of debt must remain within optimal limits to avoid excessive financial risk. This hypothesis highlights the importance of strategic capital structure management, especially in the healthcare sector in Indonesia. By utilizing the optimal combination of leverage, companies can increase competitiveness, maintain growth, and create positive outcomes for stakeholders. Based on the results of simple linear regression analysis, DAR and DER have a relationship with WACC and ROA. DAR and DER are a unit of Leverage, so it can be concluded that Leverage moderates the relationship between WACC and ROA in the Indonesian Health sector positively.

The acceptance of the next hypothesis shows that firm size, measured by total assets, acts as a moderating factor in the relationship between WACC and ROA. This result is evidenced by the R^2 value of 0.316 which means that company size strengthens the relationship between WACC and ROA by 31.6%, and the moderation regression coefficient value of company size

is -0.075. Although firm size negatively moderates this relationship, these results provide important insights into the dynamics between capital efficiency, profitability, and the scale of a firm's operations. Practically, firms with large assets tend to be more stable in the face of fluctuations in the cost of capital (WACC). However, the analysis shows that the moderating effect of firm size on the relationship between WACC and ROA is negative. This may indicate that large scale is not always a competitive advantage if the firm is unable to optimally utilize assets to generate profits. In other words, efficiency in asset management is key to maintaining a positive relationship between WACC and ROA. In the healthcare sector with much more complex and high-risk operational challenges, these findings are very relevant to the financial dynamics of meeting the needs of high-value medical services. Therefore, although firm scale can improve market perception and stability, this must be balanced with an efficient asset management strategy to support profitability. In addition, a decrease in WACC accompanied by an increase in asset productivity can increase the overall value of the firm, creating an attraction for investors and other stakeholders.

Finally, the accepted hypothesis shows that NWC plays an important role in moderating the relationship between WACC and ROA. This means that the company's liquidity, reflected through NWC, affects the extent to which the cost of capital (WACC) impacts financial performance (ROA). This result is evidenced by the R^2 value of 0.548, which means that Net Working Capital strengthens the relationship between WACC and ROA by 54.8 and the Net Working Capital moderation regression coefficient value of 0.043. When the company's NWC increases, it indicates that the company has adequate liquidity to meet its short-term obligations. Good liquidity allows companies to manage cash flow more efficiently, thereby minimizing the negative impact of high WACC on profitability. With a strong NWC, companies can allocate resources optimally for productive operational and investment activities, which ultimately increases ROA. For the healthcare sector, the company's ability to maintain a positive NWC is very important, especially because this sector requires continuous financing for research, development, and operations. Adequate NWC allows companies to maintain financial flexibility and reduce the pressure of high capital costs, thereby encouraging the creation of more value from the assets owned. Good liquidity management not only helps companies overcome high capital costs but also supports the achievement of better performance, ensuring the sustainability and competitiveness of companies in the market.

4. Conclusion

The conclusion of this study found that WACC has no effect on ROA in the Healthcare sector and suggests that the cost efficiency of capital has not been directly impacted by short-term probabilities, however, Leverage (DAR and DER) strengthens the relationship positively, which implies that wise use of debt can reduce operations. Meanwhile, firm size and cash holding weaken the relationship between WACC and ROA which means that large-scale and excessive cash reserves can reduce capital efficiency, Net Working Capital (NWC) plays a positive role in moderating the relationship, helping companies manage capital costs more efficiently and increase profitability.

This study offers practical guidance for financial managers and decision-makers in Indonesia's healthcare sector to optimize capital structure and improve financial performance. It emphasizes the critical role of efficient capital cost management (WACC) and strategic leverage, liquidity, and asset management in driving profitability. Although the impact of WACC on ROA is statistically insignificant, focusing on efficient capital management remains essential. Strategies such as negotiating competitive interest rates, diversifying funding sources, and enhancing company credibility can lower financing costs and improve margins. Leverage, measured by Debt to Asset Ratio (DAR) and Debt to Equity Ratio (DER), plays a significant role in moderating the WACC-ROA relationship. Proper use of leverage to finance strategic projects such as technology development or healthcare facility expansion can create added value if debt management is prudent and risks are mitigated. Planning, including project

feasibility analysis and cash flow projections, is crucial to balance benefits and risks. Findings indicate large company size may not always confer competitive advantage if assets are underutilized. Managers must prioritize asset efficiency by optimizing healthcare facility usage, effective inventory management, and investing in operational efficiency-enhancing technologies. Lastly, excessive cash holdings and inefficient liquidity management negatively affect profitability. Companies should use reserves strategically for investments in medical innovations, facility development, or market expansion, ensuring cash contributions to added value. By managing Net Working Capital (NWC) effectively, firms can stabilize operations, reduce financing dependency, and increase profitability.

Acknowledgment

This research was conducted without funding from any grant institutions, and the author declares that there are no conflicts of interest affecting the results of this study. The author expresses sincere gratitude to Mr. Muhammad Saiful Hakim, S.E., M.M., Ph.D. – Assistant Professor of the Department of Business Management, Institut Teknologi Sepuluh Nopember Surabaya, as the research promoter.

References

[1] H. Hartiwiningsih, I. Isharyanto, and A. Agustiwi, "The implication of the indonesian local regulations revocation towards the local economy and out of pocket healthcare," Medico-Legal Update, vol. 20, no. 1, pp. 2321–2326, 2020, doi: 10.37506/v20/i1/2020/mlu/194654.

[2] S. Siddiqi et al., "Global strategies and local implementation of health and health-related SDGs: Lessons from consultation in countries across five regions," BMJ Glob Health, vol. 5, no. 9, 2020, doi: 10.1136/bmjgh-2020-002859.

[3] A. Pichon-Riviere, M. Drummond, A. Palacios, S. Garcia-Marti, and F. Augustovski, "Determining the efficiency path to universal health coverage: cost-effectiveness thresholds for 174 countries based on growth in life expectancy and health expenditures," Lancet Glob Health, vol. 11, no. 6, pp. e833–e842, Jun. 2023, doi: 10.1016/S2214-109X(23)00162-6.

[4] A. K. Singh and A. Misra, "Impact of COVID-19 and comorbidities on health and economics: Focus on developing countries and India," Diabetes & Metabolic Syndrome: Clinical Research & Reviews, vol. 14, no. 6, pp. 1625–1630, 2020, doi: https://doi.org/10.1016/j.dsx.2020.08.032.

[5] A. B. Vanani and D. Suselo, "Determinasi Resesi Ekonomi Indonesia Dimasa Pandemi Covid-19," Jurnal Menara Ekonomi: Penelitian Dan Kajian Ilmiah Bidang Ekonomi, vol. 7, no. 2, 2021.

[6] Badan Pusat Statistik RI, "Berita Resmi Statistik No. 14/02/Th. XXV, 7 Februari 2022," Jakarta, Feb. 2022. Accessed: Nov. 23, 2024. [Online]. Available: https://www.bps.go.id/id/pressrelease/2022/02/07/1911/ekonomi-indonesia-triwulan-iv-2021-tumbuh-5-02-persen--y-on-y-.html

[7] J. Seeberg, S. Pannarunothai, R. S. Padmawati, L. Trisnantoro, N. Barua, and C. S. Pandav, "Treatment seeking and health financing in selected poor urban neighbourhoods in India, Indonesia and Thailand," Soc Sci Med, vol. 102, pp. 49–57, 2014, doi: 10.1016/j.socscimed.2013.11.039.

[8] A. Fuady et al., "Bridging the gap: financing health promotion and disease prevention in Indonesia," Health Res Policy Syst, vol. 22, no. 1, 2024, doi: 10.1186/s12961-024-01206-7.

[9] E. Adida, "Outcome-based pricing for new pharmaceuticals via rebates," Manage Sci, vol. 67, no. 2, pp. 892–913, 2021, doi: 10.1287/mnsc.2019.3574.

[10] R. del Pozo-Rubio, R. Mínguez-Salido, I. Pardo-García, and F. Escribano-Sotos, "Catastrophic long-term care expenditure: associated socio-demographic and economic factors," The European Journal of Health Economics, vol. 20, no. 5, pp. 691–701, 2019, doi: 10.1007/s10198-019-01031-8.

[11] A. N. Adnan, A. Ma'aram, R. Md. Sirat, M. F. M. Taib, A. Ismail, and Z. Libasin, "Preliminary Framework of Lean Healthcare Sustainability Performance Measurement for Health Sector," Malaysian Journal of Medicine and Health Sciences, vol. 19, no. 5, pp. 145–151, 2023, doi: 10.47836/MJMHS.19.5.21.

[12] S. L. Asnan, R. H. Albertus, and I. T. Murdo, "Effect of Return on Assets (Roa), Debt Ratio, and Quick Ratio to Value Healthcare Sector Companies on The Indonesian Stock Exchange 2018-2022," EQUILIBRIUM-Jurnal Bisnis dan Akuntansi, vol. 18, no. 2, pp. 220–231, 2024.
[13] A. Agnes and A. Isni, "The Influence of Exchange Rates, Debt to Equity, and Return on Equity on Stock Returns: A Case Study of Health and Pharmaceutical Sector Companies Listed on IDX," Russ J Agric Socioecon Sci, vol. 133, no. 1, pp. 58–66, 2023.
[14] R. H. Albertus and S. Syaiful, "The Effect of Current Ratio, Inventory Turnover, Debt To Equity Ratio, and Net Profit Margin on the Value of Companies in the Healthcare Sector Listed on Idx 2017-2020," Strategic Management Business Journal, vol. 2, no. 01, pp. 7–15, 2022.
[15] R. J. R. Mottoh and S. Supriyanto, "Effect of return on asset and return on equity on stock price," Journal of Management Science (JMAS), vol. 7, no. 3, pp. 479–484, 2024.
[16] G. Nicolò, D. Ferullo, N. Aversano, and N. Ardito, "Intellectual capital disclosure and its determinants in healthcare organisations – Evidence from Italy," International Journal of Public Sector Management, vol. 36, no. 1, pp. 20–45, 2023, doi: 10.1108/IJPSM-06-2022-0149.
[17] R. Mazzotta, "The communication of intellectual capital in healthcare organisations: What is disclosed and how?," International Journal of Knowledge-Based Development, vol. 9, no. 1, pp. 23–48, 2018, doi: 10.1504/IJKBD.2018.090500.
[18] M. Z. Frank and T. Shen, "Investment and the weighted average cost of capital," J financ econ, vol. 119, no. 2, pp. 300–315, 2016, doi: https://doi.org/10.1016/j.jfineco.2015.09.001.
[19] I. B. R. Suardana, I. N. D. Astawa, and L. K. B. Martini, "Influential factors towards return on assets and profit change," International journal of social sciences and humanities, vol. 2, no. 1, pp. 105–116, 2018.
[20] F. A. Frimpong, E. K. Akwaa-Sekyi, and R. Saladrigues, "Venture capital healthcare investments and health care sector growth: A panel data analysis of Europe," Borsa Istanbul Review, vol. 22, no. 2, pp. 388–399, 2022, doi: 10.1016/j.bir.2021.06.008.
[21] D. Ahlawat, P. Sharma, and S. Kumar, "Impact of intellectual capital on financial competitiveness in context of listed Indian healthcare enterprises," Measuring Business Excellence, 2024, doi: 10.1108/MBE-02-2024-0019.
[22] A.-H. Vu Thi and T.-D. Phung, "Capital structure, working capital, and governance quality affect the financial performance of small and medium enterprises in Taiwan," Journal of Risk and Financial Management, vol. 14, no. 8, p. 381, 2021.
[23] K. Li, J. Niskanen, and M. Niskanen, "Capital structure and firm performance in European SMEs," Managerial Finance, vol. 45, no. 5, pp. 582–601, Jan. 2019, doi: 10.1108/MF-01-2017-0018.
[24] B. Kharabsheh, M. AL-Gharaibeh, and Z. Zurigat, "Capital structure and firm performance: Dynamic framework," Int J Econ Res, vol. 14, no. 16, pp. 473–487, 2017.
[25] B. T. T. Dao and T. D. N. Ta, "A meta-analysis: capital structure and firm performance," Journal of Economics and Development, vol. 22, no. 1, pp. 111–129, Jan. 2020, doi: 10.1108/JED-12-2019-0072.
[26] P. Kumar and V. Yerramilli, "Optimal Capital Structure and Investment with Real Options and Endogenous Debt Costs," Rev Financ Stud, vol. 31, no. 9, pp. 3452–3490, Sep. 2018, doi: 10.1093/rfs/hhx093.
[27] S. Marathe, T. T. H. Wan, J. Zhang, and K. Sherin, "Factors Influencing Community Health Centers' Efficiency: A Latent Growth Curve Modeling Approach," J Med Syst, vol. 31, no. 5, pp. 365–374, 2007, doi: 10.1007/s10916-007-9078-8.
[28] S. Alfiero, V. Brescia, and F. Bert, "Intellectual capital-based performance improvement: a study in healthcare sector," BMC Health Serv Res, vol. 21, no. 1, p. 73, 2021, doi: 10.1186/s12913-021-06087-y.
[29] R. Cifuentes, T. Goméz, and A. Jara, "Capital ratios and the Weighted Average Cost of Capital: Evidence from Chilean banks," Latin American Journal of Central Banking, 2024, doi: 10.1016/j.latcb.2024.100143.
[30] A. Mongid, S. E. Hidayat, and S. Ghalib, "Cash holding in Islamic rural banks," Journal of Islamic Accounting and Business Research, 2024, doi: 10.1108/JIABR-07-2023-0209.

[31] K. Amess, S. Banerji, and A. Lampousis, "Corporate cash holdings: Causes and consequences," International Review of Financial Analysis, vol. 42, pp. 421–433, 2015, doi: https://doi.org/10.1016/j.irfa.2015.09.007.
[32] T. Santos and P. Veronesi, "Leverage," J financ econ, vol. 145, no. 2, pp. 362–386, Aug. 2022, doi: 10.1016/j.jfineco.2021.09.001.
[33] M. Zhou, K. Li, and Z. Chen, "Corporate governance quality and financial leverage: Evidence from China," International Review of Financial Analysis, vol. 73, p. 101652, Jan. 2021, doi: 10.1016/j.irfa.2020.101652.
[34] A. Bugshan, F. Alnori, and H. Ananzeh, "Corporate net working capital: evidence from Shariah compliance," International Journal of Emerging Markets, 2023, doi: 10.1108/IJOEM-06-2022-0976.
[35] G. A. Afrifa, "Net working capital, cash flow and performance of UK SMEs," Review of Accounting and Finance, vol. 15, no. 1, pp. 21–44, 2016, doi: 10.1108/RAF-02-2015-0031.
[36] A. Martias, "Analisa Pengaruh Economic Value Added, Return on Asset dan Return on Ekuitas Terhadap Market Value Added Perusahaan Saham Teraktif Di Bursa Efek Indonesia," Jurnal Akuntansi dan Keuangan, vol. 7, no. 2, 2020, [Online]. Available: http://ejournal.bsi.ac.id/ejurnal/index.php/moneter
[37] Z. Dobrowolski, G. Drozdowski, M. Panait, and S. A. Apostu, "The Weighted Average Cost of Capital and Its Universality in Crisis Times: Evidence from the Energy Sector," Energies (Basel), vol. 15, no. 18, Sep. 2022, doi: 10.3390/en15186655.
[38] G. Wawro, "Estimating Dynamic Panel Data Models in Political Science," Political Analysis, vol. 10, no. 1, pp. 25–48, Jan. 2002, doi: 10.1093/pan/10.1.25.
[39] M. Arellano, "Generalized Method of Moments and Optimal Instruments," 1992.
[40] S. Mutiah, Y. Hasnataeni, A. Fitrianto, E. Erfiani, and L. M. R. D. Jumansyah, "Perbandingan Metode Klastering K-Means dan DBSCAN dalam Identifikasi Kelompok Rumah Tangga Berdasarkan Fasilitas Sosial Ekonomi di Jawa Barat," Teorema: Teori dan Riset Matematika, vol. 9, no. 2, p. 247, Sep. 2024, doi: 10.25157/teorema.v9i2.16290.
[41] F. Rahman, "Impact of WACC on Firm Profitability: Evidence from the Food and Allied Industry of Bangladesh," European Journal of Business and Management Research, vol. 7, no. 6, pp. 89–92, Nov. 2022, doi: 10.24018/ejbmr.2022.7.6.1707.
[42] C. Nguyen Thanh, "Optimal Cash Holding Ratio for Non-Financial Firms in Vietnam Stock Exchange Market," Journal of Risk and Financial Management, vol. 12, no. 2, p. 104, Jun. 2019, doi: 10.3390/jrfm12020104.