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The Effect of Liquidity and Leverage on Profitability, with Company Size as a Moderating Variable, in Companies in the Automotive Subsector (Automobiles & Components) Listed on the Indonesia Stock Exchange

Ade Saefu Rohman*, Maiyaliza
Universitas Swadaya Gunung Jati Cirebon, Indonesia
Email: ade.122020074@ugj.ac.id*, maiyaliza@ugj.ac.id

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Abstract

This research examines the effect of liquidity and leverage on profitability, with firm size as a moderating variable, in automotive subsector companies listed on the Indonesia Stock Exchange (IDX). The research was motivated by the fluctuating financial performance of the automotive industry during the post-pandemic recovery period, particularly regarding liquidity management, debt utilization, and profitability achievement. This research aims to analyze the influence of liquidity, proxied by the Current Ratio (CR), and leverage, proxied by the Debt-to-Equity Ratio (DER), on profitability measured by Return on Assets (ROA), as well as the moderating role of firm size. The research employed a quantitative associative approach using secondary data obtained from annual financial reports of automotive and component companies listed on the IDX during 2018–2024. The sample consisted of five companies selected through purposive sampling, resulting in 30 observations after outlier elimination. Data analysis was conducted using Moderated Regression Analysis (MRA). The results indicate that liquidity and leverage have a positive and significant effect on profitability. Furthermore, firm size significantly moderates and strengthens the relationship between liquidity and profitability as well as the relationship between leverage and profitability. These findings imply that companies with effective working capital management, optimal debt structures, and larger asset capacities tend to achieve higher profitability levels. The study supports the Working Capital Theory and Trade-Off Theory in explaining corporate financial performance in the automotive industry.

INTRODUCTION

The automotive industry is one of the main pillars of Indonesia's manufacturing sector, but it has faced significant pressure since the pandemic in 2020. Based on GAIKINDO's report, national car sales volume dropped drastically from 1,030,126 units in 2019 and in 2020 it was only 578,327 units, or a decrease of 43.9% (GAIKINDO, 2021). This sharp decline caused the company's cash flow to weaken and had an impact on declining liquidity, while short-term liabilities still had to be met. In the same period, most companies, such as PT Astra International Tbk, increased from 49.3% (2019) to 53.7% (2020) in line with the need for funding to maintain production and operational capacity (Astra International, 2021). This condition strengthens liquidity and leverage management in maintaining the company's profitability (Pradnyaswari & Dana, 2022).

Entering the recovery period, the automotive industry has again shown improvement. GAIKINDO data recorded that automotive sales increased to 887,202 units in 2021, then

reached 1,048,040 units in 2022 (GAIKINDO, 2023). However, such an increase in sales is not always followed by an increase in the company's profitability. For example, PT Indomobil Sukses International Tbk's ROA only increased slightly from 0.79% (2021) to 1.12% (2022), despite the company's sales rising. This is due to the high leverage ratio, where the company's (DER) reached 2.23 in 2022, so that interest expense increased and pressured the net profit of Ramadan & Larasati (2022). These findings show that increasing leverage during the recovery period has the potential to reduce profitability if debt management is not optimal.

Industry facts also show that there is a difference in durability between large and small-scale companies. Large companies such as Astra International have total assets of more than IDR 350 trillion, while some medium-small automotive companies have assets below IDR 5 trillion. This difference in scale affects the company's ability to manage liquidity, gain access to funding, and bear market risk. This is that firm size has the potential to moderate the relationship between liquidity, leverage, and profitability (Zurriah & Prayogi, 2023).

OJK data (2024) also shows that the average (CR) of companies in the automotive subsector for the 2020-2023 period is in the range of 1.20-1.80, while the average DER is in the range of 1.50-2.40, which shows that the dependence on debt-based funding is relatively high. However, the profitability rate (ROA) of the automotive subsector is only in the range of 1%-3%, much lower than other subsectors such as consumer goods which were able to reach 6%-8% in the same period Sati et al., (2024). This imbalance between increased leverage and low profitability further emphasizes the need to analyze the relationship between these variables.

Previous research results have also shown differences between the influence of leverage and liquidity on profitability, in addition to industry phenomena (Samo dan Murad 2019; Zaitoun dan Alqudah 2020; Ayoush *et al.* 2021). Pradnyaswari and Dana (2022) found that although there is little leverage in the auto subsector, liquidity and company size have a significant influence on ROA. Although the return leverage is not significant, Ramadhan and Larasati (2022) found that liquidity has a significant influence on return on assets (ROA). However, according to research conducted by Sati et al. (2024), the size of a company affects the influence of liquidity and leverage on profitability in the food and beverage industry. In addition, Zurriah and Prayogi (2023) found that the size of the company did not affect the liquidity relationship with ROA as moderation. These variations suggest that there is no clear conclusion yet about the effect of moderation of firm size.

Different results show a variation in the study. First, the results of the study are inconsistent regarding the effect of liquidity and leverage on profitability. Second, moderation variation, which is inconsistent research results regarding the role of company size as a moderation variable. Third, contextual variation occurs because most of the research was done in other fields, such as food and beverage, mining, and transportation, rather than research conducted in the automotive industry. Fourth, there is a time gap due to little research conducted with the latest data from 2020–2024, which is the most dynamic period in the automotive industry. This research is very important because it will provide empirical evidence on how liquidity and leverage impact profitability with company size as a moderation variable in companies in the automotive subsector of the Indonesia Stock Exchange.

Previous studies have also shown that managing leverage and liquidity is essential to maintain stable profitability. A study by Maiyaliza et al., t.t. (2022) found that the Current Ratio

(CR) and Debt to Equity Ratio (DER) greatly affect the profitability of companies in the coal subsector. As a result, the researcher wanted to re-evaluate the consistency of the influence of these variables on various subsectors, especially the automotive subsector, by adding the company size variable as a moderation factor.

This study aims to analyze the effect of liquidity proxied with Current Ratio (CR) and leverage proxied with Debt-to-Equity Ratio (DER) on profitability measured using Return on Assets (ROA) in automotive subsector companies listed on the Indonesia Stock Exchange (IDX). In addition, this study also examines the role of company size as a moderation variable in the relationship between liquidity and profitability and the relationship between leverage and profitability. The results of the research are expected to provide theoretical and practical benefits for academics, investors, and companies in understanding the factors that affect the company's profitability.

This study uses two main theories. First, Working Capital Theory (Smith, 1980) is the basis for the liquidity variable (X1) measured by the Current Ratio (CR), where optimal working capital is required for the company to run operations without obstacles, and affects profitability (Y) as measured by Return on Assets (ROA). Second, the Trade-Off Theory (Myers, 1984) underlies the leverage variable (X2) which is measured by the Debt to Equity Ratio (DER) and company size (Z) as the moderation variable. This theory explains that companies will use debt to the extent that the tax benefits still outweigh the risk of bankruptcy, while the large size of the company provides economies of scale advantages, wider access to funding, and cost stability that affect how liquidity and leverage impact profitability. The integration of these two theories provides a strong conceptual foundation to explain the interaction between variables in automotive subsector companies that have large capital requirements and fast operating cycles.

Empirical studies from nine previous studies show inconsistent results. Several studies have found that liquidity has a significant effect on profitability (Ramdhan & Larasati, 2022; Pradnyaswari & Dana, 2022; Zurriah & Prayogi, 2023), while other studies show negative or insignificant results. Similarly, with leverage, there are studies that report a positive influence (Akbar & Nugraha, 2023; Sati et al., 2024) and some reported negative or insignificant influences. The role of company size moderation also still shows mixed results. In addition, most of the research was conducted in sectors other than automotive (such as food-beverages, coal, and transportation) and not many used post-pandemic data (2020–2024). Therefore, this study aims to examine the influence of liquidity and leverage on profitability with company size as a moderation variable in automotive subsector companies listed on the IDX, referring to the findings of Maiyaliza et al. (2022) which show the consistency of the influence of CR and DER on profitability in the coal sector..

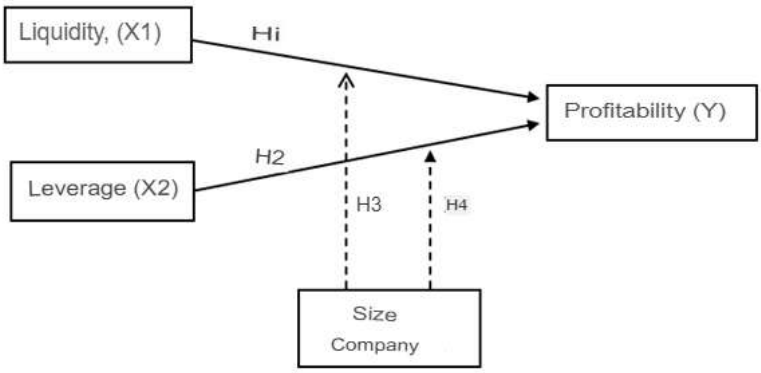

Figure 1. Conceptual Framework of the Effect of Liquidity and Leverage on Profitability with Firm Size as a Moderating Variable

Source: Author's conceptualization based on theoretical review (Working Capital Theory and Trade-Off Theory), 2025

Based on the concept and results of previous research, it can be assumed that the variables of liquidity (X1) and leverage (X2) have an effect on profitability (Y), and these influences can be strengthened/weakened by the size of the company (Z).

H1: Shows that liquidity greatly affects profitability.

H2: Shows that leverage has a big impact on profitability.

H3: Explain how the size of the business affects the relationship between liquidity and leverage.

H4: Explain how the size of the business affects the relationship between leverage and profitability.

RESEARCH METHOD

Research Design

The aim of this quantitative research, conducted using an associative method, was to determine how the variables of profitability, leverage, and liquidity interact and impact each other. Company size is used as a moderation variable. Because this study uses numerical data from the financial statements of automotive subsector companies listed on the IDX from 2018 to 2020, a quantitative approach is used. In analysis, statistical tools are used to obtain objective and measurable empirical evidence.

Location and Time of the Research

This study uses data from the official website of the Indonesia Stock Exchange and the annual report of each company listed in the automotive subsector on the Indonesia Stock Exchange. The research lasted from November 2024 to January 2025, and included the stages of data collection, data processing, analysis, and report preparation.

Population & Sample

1. Population

The population in this study is all companies included in the Automobiles & Components subsector listed on the (IDX) during the observation period 2018–2024. The population

amounted to 17 companies that were consistently recorded in related subsectors. The analysis used in this study is at the company level (corporate entity).

2. Sampling Technique

Purposive sampling is a sampling method that is based on the selection of units based on the researcher's criteria. This method was chosen because the research requires complete and consistent financial statements for each research variable, so that companies that meet certain criteria are considered to meet the sample criteria. As a result, purposive sampling is considered appropriate to obtain samples.

3. Sample Selection Criteria
   a. Automobiles & Components sub-sector companies listed on the IDX for the period 2018–2024
   b. Companies that are not listed continuously during 2018–2024 (new IPO/delisting)
   c. Companies that do not have complete financial statements in 2018–2024
   d. Companies for which research variable data are not available in full (Liquidity, Leverage, Profitability, Company Size)
   e. Companies that have suffered consecutive losses (if the research criteria require positive profits)

Table 1. Summary of Previous Empirical Studies on Liquidity, Leverage, Profitability, and Firm Size

No	Remarks	Quantity
1	Automobiles & Components *sub-sector companies* listed on the IDX for the period 2018–2024	17
2	Companies that are not listed continuously during 2018–2024 (new IPO/delisting)	(6)
3	Companies that do not have complete financial statements in 2018–2024	(3)
4	Companies that use the USD currency in financial reporting	(2)
5	Companies whose research variable data is not available/unstable	(1)
	Total samples	**5**

Source: Compiled by the author from various cited sources (2022–2024)

Number of samples (7 years x 5 companies = 35 samples)

a. Initial Sample : 35 Data
b. Data Outlier : (5) Data
c. Total data processed : 30 Data

The initial sample of this study was 35 data. However, there are 5 data that are categorized as outliers (extreme data) so they must be excluded to meet the assumption of normality. So, the number of final observations is 30 data

Data Types and Sources

These results come from quantitative data derived from numbers in the company's financial statements. Secondary data for this study comes from the annual reports, or annual reports, and audited financial statements of companies in the Automobiles & Components subsector listed on the IDX from 2018 to 2024.

1. Indonesia Stock Exchange (www.idx.co.id)
2. Official website of each sample company
3. Financial Services Authority (OJK)

4. Academic literature, scientific journals, and relevant publications that support the foundations of research theory.

The data collected includes the variables of Liquidity, Leverage, Profitability, and Company Size.

RESULTS AND DISCUSSION

Descriptive Statistical Test

Table 2. Descriptive Statistics of Research Variables (LN_CR, LN_DER, LN_ROA, LN_Z) After Outlier Elimination

Descriptive Statistics

	N	Minimum	Maximum	Mean	Hours of deviation
LN_CR	30	.15	1.82	.9264	.51034
LN_DER	30	-2.28	-.25	-1.0155	.48673
LN_ROA	30	-.05	.20	.0727	.06505
LN_Z	30	3.32	3.42	3.3711	.03680
Valid N (listwise)	30				

Source: Secondary data processed by SPSS (2025)

The Descriptive Statistics Table provides an overview of the data profiles of 30 samples of automotive subsector companies during the 2020-2023 period. The mean of the LN_CR of 0.9264 and the LN_DER of -1.0155 reflect the very dynamic condition of the company's capital structure and liquidity, especially when facing the pressure of declining national sales due to the pandemic in 2020. Theoretically, this data supports the Working Capital Theory which emphasizes the importance of maintaining working capital at an optimal level to ensure the smooth operation of the company in the midst of market fluctuations. This condition is in line with the industry phenomenon which shows that the fluctuation in financial ratios is greatly influenced by the ability to manage its assets and short-term liabilities to survive the economic recovery period.

Classic Assumption Test

1. Uji Kolmogorov-Smirnov.

Table 3. One-Sample Kolmogorov-Smirnov Normality Test for Unstandardized Residuals

One-Sample Kolmogorov-Smirnov Test

		RES_1 Unstandardized Residual
N		30
Normal Parameters [a,b]	Mean	.0000000
	Hours of deviation	.04691350
Most Extreme Differences	Absolute	.105
	Positive	.058
	Negative	-.105
Test Statistic		.105
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Source: SPSS output (2025)

Asymp value. Sig. (2-tailed) 0.200 was found in the results of the Kolmogorov-Smirnov test One Sample. Since the value is greater than 0.05, this regression model shows that the data is normally distributed. Parameter estimation is reliable because the model meets the requirements of key parametric statistics. It is important to meet these assumptions of normality before conducting further analysis to answer the inconsistencies in the results of previous research conducted by Pradnyaswari and Dana (2022) and Ramadhan and Larasati (2022).

2. Multicollinearity Test

Table 4. Multicollinearity Test (VIF Values) for Independent Variables and Moderating Variable

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Say.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	LIVE
1	(Constant)	-1.585	1.005		-1.578	.127		
	LN_CR	.143	.030	1.122	4.762	.000	.360	2.777
	LN_DER	.102	.029	.760	3.487	.002	.421	2.377
	LN_Z	.483	.297	.273	1.625	.116	.708	1.413

a. Dependent Variable: LN_ROA

Source: SPSS output (2025)

The Coefficients table shows the Collinearity Statistics value with the VIF number on the LN_CR variable of 2.777, LN_DER of 2.377, and LN_Z of 1.413. Considering that all VIF values are far below the number 10, this research model is declared free from multicollinearity problems. The absence of a strong correlation between these independent variables ensures that the influence of each variable on profitability (ROA) can be accurately measured without any overlapping influences. This validity is crucial in examining the research gap related to the role of company size moderation, which previously had varying results between studies (Sati et al, 2024) and (Zurriah, 2023).

3. Autocorrelation Test

Table 5. Durbin-Watson Autocorrelation Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.693a	.480	.420	.04955	1.677

a. Predictors: (Constant), LN_Z, LN_DER, LN_CR
b. Dependent Variable: LN_ROA

Source: SPSS output (2025)

According to the results of the autocorrelation test shown in the Model Summary table, a Durbin-Watson (DW) value of 1.677 was obtained, which is around the number 2, indicating

that there were no significant autocorrelation or residual correlation problems in the regression model. The certainty of the model's freedom from autocorrelation interference is critical to ensure that the results of the test of the effects of liquidity and leverage on profitability are valid and unbiased. This strengthens the basis of analysis in answering the research gap related to the inconsistency of the influence of financial variables on the automotive subsector previously researched by Pradnyaswari and Dana (2022) and Ramadhan and Larasati (2022). With this assumption in place, your regression model can be relied upon to predict the relationships between variables according to the established frameworks of Working Capital Theory and Trade-Off Theory.

4. Heteroskedasticity Test

Table 6. Heteroscedasticity Test (Glejser Method) – Absolute Residual Regression

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Say.
		B	Std. Error	Beta		
1	(Constant)	.366	.550		.666	.511
	LN_CR	.012	.016	.230	.736	.469
	LN_DER	.017	.016	.303	1.048	.304
	LN_Z	-.096	.163	-.131	-.588	.561

a. Dependent Variable: Abs_RES

Source: SPSS output (2025)

The results of the Glejser test, which was performed by regressing independent variables to the residual absolute value (Abs_RES), showed that LN_CR was 0.469, LN_DER was 0.304, and LN_Z was 0.561. Because all variables have a Sig. value above 0.05, this model is declared to have passed the heteroscedasticity test. This indicates that the residual variance is identical for each observation. The Glejser method is precise and produces a more objective scatterplot graph than the conventional method. This ensures that the regression model continues to explain well how the variables affect each other. This is in accordance with the principles used in transaction theory and capital work.

Mra Test

1. Test F

Table 7. Simultaneous Significance Test (F-Test) for Liquidity, Leverage, and Interaction Variables

ANOVA

Model		Sum of Squares	df	Mean Square	F	Say.
1	Regression	.059	3	.020	7.940	.001b
	Residual	.064	26	.002		
	Total	.123	29			

a. Dependent Variable: LN_ROA

b. Predictors: (Constant), INT_DERZ, LN_Z, INT_CRZ

Source: SPSS output (2025)

The ANOVA table shows the value of F (Simultaneous Significance), which has a significance level (Sig.) of 0.001, which is lower than 0.05. These results show that the variables liquidity (CR), leverage (DER), and their relationship to company size greatly affect overall profitability (ROA) and separately. Overall, this model shows that a framework of thinking that combines financial aspects and the scale of a company is very relevant to explain how automotive companies operate on the Indonesia Stock Exchange. This supports the idea in the Trade-Off Theory that the size of the company and the combination of capital structure and resource capacity are the main factors that determine the financial success of a company.

2. R2 Test

Table 8. Adjusted R Square for Moderated Regression Analysis Model

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.691a	.478	.418	.04963	1.682

a. Predictors: (Constant), INT_DERZ, LN_Z, INT_CRZ
b. Dependent Variable: LN_ROA

Source: SPSS output (2025)

The Model Summary Table shows the Adjusted R Square value of 0.420. This value shows that company size, leverage, and liquidity are moderation variables of 42% of the variable variation in profitability (ROA). However, the last 58% came from variables that were not included in this study model. This robust determination data shows that the final net profit of automotive companies is strongly influenced by the relationship between working capital management and the scale of the company. This is especially true for the post-pandemic market.

3. Ui T & Moderation

Table 9. Moderated Regression Analysis (MRA) – T-Test Results for Direct and Interaction Effects

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Say.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	LIVE
1	(Constant)	-1.581	1.007		-1.570	.128		
	LN_Z	.482	.298	.273	1.618	.118	.707	1.415
	INT_CRZ	.042	.009	1.114	4.745	.000	.364	2.748
	INT_DERZ	.030	.009	.759	3.476	.002	.421	2.375

a. Dependent Variable: LN_ROA

Source: SPSS output (2025)

a. Effect of Liquidity on Profitability (H1): The liquidity variable (LN_CR) has a t-calculation value of 4.762 with a significance value (Sig.) of 0.000. Since the significance value of 0.000 is less than 0.05, H1 is accepted, indicating that liquidity has a positive and significant impact on profitability.
b. Effect of Leverage on Profitability (H2): The Leverage variable (LN_DER) has a t-count

value of 3.487 and a significance value (Sig.) of 0.002. Since the significance value of 0.002 is smaller than 0.05, H2 is accepted.

c. The interaction variable of Liquidity and Company Size (INT_CRZ), the interaction test (MRA) showed a t-calculated value of 4.745 with a significance of 0.000 < 0.05. Based on these statistical bases, H3 is accepted; Company size has been shown to significantly moderate, or strengthen, the influence of liquidity on profitability.
d. Company Size Moderates the Relationship of Leverage to Profitability (H4): A t-calculated value of 3.476 with a significance of 0.002 < 0.05 resulted from the interaction test of the leverage variable and company size (INT_DERZ), which indicates that H4 is accepted, which means that the size of the company

The Effect of Liquidity on Profitability

Based on the results of the T test, the Liquidity variable showed a significance value of 0.000, where the value was smaller than the significance level of 0.05 (0.000 < 0.05). Thus, the first hypothesis (H1) is accepted, which means that Liquidity has a positive and significant effect on Profitability.

In business logic, high liquidity reflects the ability of automotive companies to manage their working capital. In industries that require rapid stock turnover such as automotive, the availability of strong current assets allows companies to innovate products and maintain parts availability without relying on expensive external debt. This is in line with Signal Theory, where a healthy liquidity ratio gives investors' confidence that the company has a low risk of default, thus having an impact on improving financial performance (ROA).

The results of this study reinforce the findings of Ramadhan & Larasati (2022) which states that an adequate level of liquidity is a guarantee for the sustainability of the company's operations. However, this study is not in line with the results of Rosihana (2023) who in her research found that liquidity has no effect on profitability.

The Effect of Leverage on Profitability

The results of the statistical analysis for the Leverage variable resulted in a significance value of 0.002, which is smaller than 0.05 (0.002 < 0.05). This shows that Leverage has a positive and significant effect on Profitability, so the second hypothesis (H2) is accepted.

This finding proves that in companies in the automotive subsector, the use of debt is not a debilitating burden, but rather an operational leverage tool. Based on the Trade-off Theory, companies use debt to fund productive assets (such as factory machinery) due to the benefits of tax protection (tax shield) from interest expenses. As long as the rate of return on the investment is greater than the cost of the debt, then leverage will continue to drive an increase in the company's net profit.

This research supports the results of research by Sati, Dwilita, & Fachruddin (2024) which stated that leverage makes a positive contribution to increasing profits. On the other hand, these results are in contrast to the research of Ramadhan & Larasati (2022) which shows a negative relationship between leverage and profitability.

Company Size Moderates the Relationship of Liquidity to Profitability

Through the Moderated Regression Analysis (MRA) test, a significance value of 0.000 < 0.05 was obtained. This proves that Company Size is able to moderate (strengthen) the influence of Liquidity on Profitability.

The large size of the company provides an advantage in terms of "efficiency of scale". Large-scale automotive companies tend to have a more integrated financial management system. When large companies have high liquidity, they can allocate those funds to various lines of business more effectively than small companies. This is what causes the impact of liquidity on profitability to be much stronger when the size of the company is getting larger.

These results are consistent with the research of Akbar & Nugraha (2023) which states that company size acts as a moderation that reinforces the influence of independent variables on financial performance.

Company Size Moderates the Relationship of Leverage to Profitability

The results of the moderation test for the Leverage variable showed a significance value of 0.002 < 0.05. This means that Company Size significantly moderates and strengthens the influence of Leverage on Profitability.

Logically, large companies have high asset stability so they have access to loans with lower interest rates than small companies. With a wide scale of operations, large companies can leverage their leverage for massive market expansion, which directly increases profitability. The size of the company here is a catalyst that turns debt risk into greater profit opportunities.

The results of this study support the findings of Sati et al., (2024) who stated that asset capacity (company size) greatly determines the extent to which debt can be converted into profits for the company.

CONCLUSION

Based on the results of data analysis and discussion on the influence of liquidity and leverage on profitability with company size as a moderation variable in automotive subsector companies listed on the Indonesia Stock Exchange for the 2018–2024 period, it can be concluded that liquidity and leverage have a positive and significant effect on company profitability. In addition, company size has been shown to moderate and strengthen the relationship between liquidity and profitability as well as the relationship between leverage and profitability. The results of this study show that companies with good working capital management, optimal debt structure, and large asset capacity tend to have higher ability to increase company profits. The findings support the Working Capital Theory, Trade-Off Theory, and Firm Size concept, which states that large companies have better operational efficiency, bargaining power, and risk management capabilities than small companies. Based on these conclusions, automotive companies are advised to maintain liquidity levels and manage leverage carefully to maintain a positive impact on profitability. Investors are also advised to be more selective in choosing companies with large sizes because they are considered more stable in dealing with operational and financial risks. Meanwhile, for future researchers, it is recommended to add other relevant variables, such as working capital turnover or inflation, as well as expand the period and object of research so that the research results can

be generalized more widely and provide a more in-depth academic contribution.

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