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Firm Value: Analysis of Capital Structure, Capital Intensity, and Cash Holding in Transportation and Logistics Listed Companies

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Abstract---*This study aims to provide empirical evidence by analyzing the influence of capital structure, capital intensity, and cash holding on firm value in transportation and logistics companies listed on the Indonesia Stock Exchange during the 2020 2024 period. The variables examined in this study include capital structure, capital intensity, cash holding, and firm value. Data were collected through documentation and literature studies. The study population consisted of 60 transportation and logistics companies that were previously or are currently listed on the Indonesia Stock Exchange during the 2020–2024 period. The sample was determined using purposive sampling, resulting in 17 transportation and logistics companies with 85 observations over five years. Panel data regression analysis was employed with the assistance of STATA 17 software. The results indicate that, partially, capital structure has a significant negative effect on firm value, capital intensity has no significant effect on firm value, and cash holding has a significant positive effect on firm value.*
Keywords---*Capital Intensity, Capital Structure, Cash Holding, Firm Value, Transportation and Logistics Listed Companies.*

Introduction

Transportation and logistics companies play a vital role in global and domestic supply chains. The transportation sector has played a strategic role in supporting and facilitating both domestic and international trade, as it enables a more efficient flow of goods from production sites to consumers, thereby ensuring the fulfillment of consumer needs. Currently, the development of transportation services in Indonesia is beginning to show progress, as evidenced by the growing number of industrial companies that rely on these services (Maulinasari, 2022). An indicator of the development of the transportation and logistics sector in Indonesia is reflected in the increasing number of companies operating in this sector.

Data from the Central Statistics Agency, titled *2016 Economic Census*, presents the results of data collection on transportation and warehousing businesses conducted across all regions of Indonesia, covering 24 provinces and 514 districts/cities. Based on the results, a total of 1,302,455 business units in the transportation and warehousing sector were recorded. This figure was obtained through sample data collection for micro and CSall enterprises (UMK) and complete data collection for medium and large enterprises (UMB), categorized by province and type of business activity. These business units include postal and courier services, water transportation, transportation support activities, as well as land and pipeline transportation warehousing.

In addition, the Central Statistics Agency, with the title of 2024 VPEK-24 warehousing, expedition and courier statistics which has been implemented in 372 districts/cities covering 38 provinces in Indonesia in 2024, published

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the results of the proportion of companies according to income scale in the national warehousing, expedition and courier business. For the results of the proportion of companies according to revenue scale in the warehousing business nationally, they have business revenues below 2 billion per year with a percentage of 50.43 percent; business scales above 2 to 15 billion are 36.23 percent; business scales above 15 to 50 billion are 8.53 percent; and the remaining 4.81 percent with a business scale above 50 billion. In addition, for the results of the proportion of companies according to revenue scale in the expedition and courier business nationally, they have business revenues below 2 billion per year with a percentage of 66.17 percent; with a business scale above 2 to 15 billion is 27.52 percent, a business scale below 15 to 50 billion is 4.62 percent; and the remaining 1.69 percent with a business scale above 50 billion. Although indicated as strategic and having large business opportunities, this sector still faces major problems, namely high logistics costs.

Based on the results of the Logistics Performance Index (LPI) 2023 published by the World Bank, Indonesia was ranked 61st out of 139 countries. The country's score declined from 3.15 (on a scale of one to five) in 2018 to 3.00 in 2023, resulting in a drop of 17 positions from its previous rank of 46 in 2018. This decline was influenced by the rising logistics performance scores of several ASEAN countries, with significant ranking improvements recorded by Singapore, which moved from seventh to first place, Malaysia, which climbed 15 positions (from 41st to 26th), and the Philippines, which rose 17 positions (from 60th to 43rd). The LPI score is based on six key components: customs, infrastructure (transport and port infrastructure), international shipments, logistics competence, tracking and tracing, and timeliness.

"Although data from the Indonesian government indicate a decline in Indonesia's logistics costs to 14.1 percent of the gross domestic product (GDP), when compared to neighboring countries in the ASEAN region, the cost level is still classified as relatively high. When including export logistics costs, which account for 8.98 percent of GDP, the total national logistics burden reaches 23.08 percent of GDP. In Malaysia, logistics costs are around 13 percent of GDP, while in Singapore, they are approximately 8 percent of GDP. This was conveyed by senior researcher of Tenggara Strategics, Ms. Eva Novi Karina, along with leading experts Mr. Yose Rizal Damuri and Mr. Widodo Ramadyanto, during a conference held on November 22, 2024," (December 13, 2024), as reported by The Jakarta Post.

High logistics costs exert pressure on a company’s cost structure, thereby influencing financial policies, including capital structure decisions. Companies facing a heavy logistics cost burden often require additional funding to maintain operational continuity and support investments, which can lead to an increase in leverage. In efforts to strengthen capital structure, funding needs can be met through internal or external sources that are deemed safe for the company. When such funds are utilized to reinforce capital structure, capital management can be carried out in an optimal, effective, efficient, and well-targeted manner. According to signalling theory, this condition can be interpreted as a positive signal conveyed to investors, thereby attracting investment interest due to its perceived potential for generating returns (Damayanti & Darmayanti, 2022).

Furthermore, high logistics costs also affect capital intensity, which refers to the extent to which a company allocates fixed assets to support its operations. Logistics companies typically have high capital intensity due to the need for large-scale assets such as vehicles, warehouses, ports, and supply chain management systems. Greater investment in capital assets can accelerate production processes, save time, and enhance operational efficiency. Strong capital intensity reflects the optimal utilization of assets to support increased profitability (Kusumaningrum & Triyono, 2025).

On the other hand, to maintain operational continuity amid high and unstable logistics costs, companies tend to hold large amounts of cash as a form of liquidity and protection against uncertainty. This gives rise to the phenomenon of *cash holding*, which refers to a company’s policy of retaining significant amounts of cash. Holding large amounts of cash can be seen as an indicator of a high level of liquidity. However, this condition may also suggest slow cash turnover, indicating over-investment in cash and reflecting inefficiencies in cash management (Anwar et al., 2023).

All aspects above, namely capital structure, capital intensity, and cash holding, contribute to firm value, which is the main indicator in assessing the performance and prospects of a business entity. When large asset ownership is utilized optimally, an increase in firm value can be achieved, allowing stock prices to trade above their book value. Conversely, if assets are not used effectively, a decline in firm value may occur, and stock prices tend to fall below their book value (Hidayat, 2019, in Damayanti & Darmayanti, 2022). Current and potential investors may use financial and non-financial information disclosed to the public to assess a company for their investment decisions. As a result, company policies or plans that are responded to by the market can influence the company's value (Firmansyah et al., 2020). Firm value is also influenced by how efficiently management controls operational and financial costs. In the context of transportation and logistics companies, high logistics costs that are not accompanied by appropriate financial strategies may lead to a decrease in firm value in the eyes of investors.

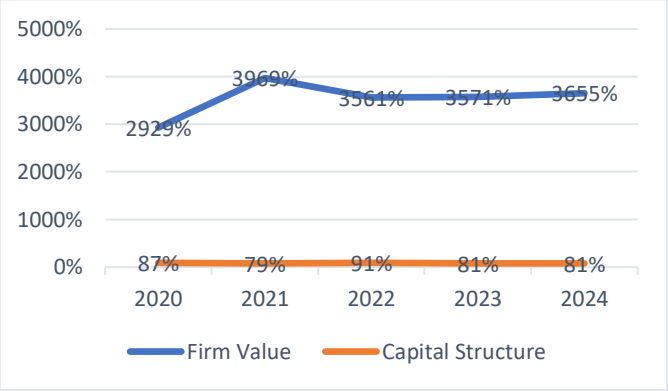

Figure 1. Average Capital Structure and Firm Value of Transportation and Logistics Listed Companies on the IDX for the 2020-2024 Period
Source: idx.co.id (processed data)

Based on Figure 1 above, it can be observed that changes in capital structure and firm value in the transportation and logistics sector move in both the same and opposite directions. This may indicate either a positive or a negative influence of capital structure on firm value. According to Signalling Theory, an increase in debt by management can serve as a positive signal to the market, indicating that management is optimistic about future cash flows. However, debt management must be conducted wisely, as it is considered highly sensitive to fluctuations in firm value. If the proportion of debt is maintained within appropriate limits, it may lead to an increase in firm value. Conversely, if debt usage exceeds the proportional threshold, the market may perceive it as a negative signal due to rising financial risk, ultimately resulting in a decline in firm value (Ayuningtyas et al., 2020). Therefore, companies have an interest in balancing their capital structure to ensure that the signals conveyed are effective and do not create negative perceptions.

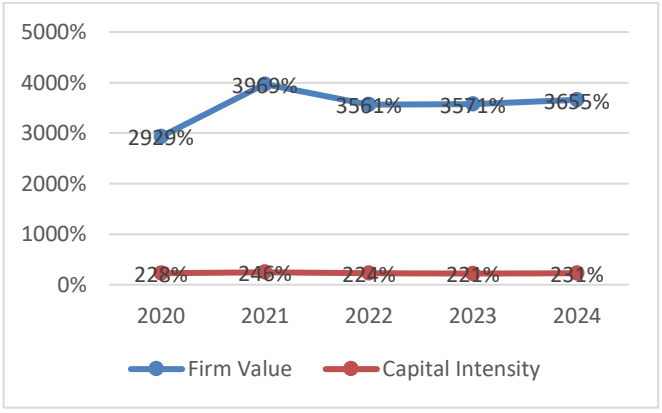

Figure 2. Average Capital Intensity and Firm Value of Transportation and Logistics Listed Companies on the IDX for the 2020-2024 Period
Source: idx.co.id (processed data)

Based on Figure 2 above, it can be observed that in 2021 and 2023, capital intensity experienced movements in opposite directions from firm value. This may indicate either a positive or a negative influence of capital intensity on firm value. From the perspective of signalling theory, a company's decision to make large investments in fixed assets can serve as a signal to investors.

Freshillya et al. (2025) state that the greater the amount of assets utilized in the production process, the higher the perceived value of those assets. Therefore, capital management must be carried out efficiently so that asset utilization in operational activities can be effective, while also maintaining the company's profitability and growth. Continuous profit growth is seen as capable of attracting investor interest and contributing to the sustainable increase of firm

value. However, excessively high capital intensity may also raise concerns, as the company may face issues related to inefficiency, high fixed costs, and limited flexibility in adapting to market changes.

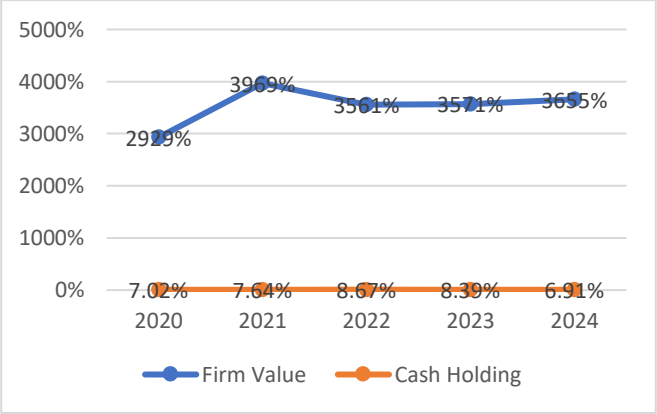

Figure 3. Average Cash Holding and Firm Value of Transportation and Logistics Listed Companies on the IDX for the 2020-2024 Period
Source: idx.co.id (processed data)

Based on Figure 3 above, it can be observed that in 2022 and 2023, cash holdings exhibited movements in opposite directions from firm value. This may indicate either a positive or negative influence of cash holding on firm value. In the context of signalling theory, the amount of cash retained by a company serves as a signal to investors regarding its internal conditions and business opportunities. Holding an adequate amount of cash is often perceived as preparation for expansion or part of a growth strategy, and thus may be viewed by the market as a positive signal with the potential to enhance firm value (Margaritis & Psillaki, 2010). However, excessive cash holding may also generate negative signals, as it can be interpreted as a sign of inefficient investment (Ardianto & Sulaiman, 2024).

The following is a research gap regarding the variables of capital structure, capital intensity and cash holding on firm value. Imronudin et al. (2022); Nopianti & Suparno (2021); and Oktiwiati & Nurhayati (2020) found that capital structure has a positive effect on firm value. Contrary to this finding, Abdillah & Situngkir (2021); Supeno et al. (2022); and Yusuf & Syarif (2021) found that capital structure negatively impacts firm value. However, Ferriswara et al. (2022); Natalia & Bertuah (2022); and Nurhayati et al. (2020) found that capital structure has no effect on firm value.

Research related to capital intensity has been conducted by Alamsah & Adi (2022); Armiawan & Achyani (2024); and Zhafira & Astuti (2024), who found that capital intensity has a positive effect on firm value. This contrasts with the results of research conducted by Putri et al. (2025); and Siregar & Yanti (2024), which found that capital intensity had a negative effect on firm value. However, research conducted by Natali & Herawaty (2020); Natalia & Bertuah (2022); and Supia et al. (2021) found different results, namely that capital intensity had no effect on firm value.

Based on research by Emanuel et al. (2022); Halim (2022); and Anandita & Septiani (2023), which found that cash holding has a positive influence on firm value. However, research by Anwar et al. (2023); Firmansyah et al. (2020); Putri & Lisiantara (2022) found that cash holding has a negative influence on firm value. Other results were found in research by Agustianingrum et al. (2023); Sriyono & Ramadhani (2023); and Suzan & Supriyadiputri (2023), which stated that cash holding does not influence firm value. Based on the description of the phenomenon and the results of several previous studies, the variables studied have not produced consistent results, so further research is needed. Referring to the problems and background above, the purpose of this study is to determine and analyze "Firm Value: Analysis of Capital Structure, Capital Intensity, and Cash Holding in Transportation and Logistics Listed Companies ".

Literature review
Signalling Theory

The Signalling Theory proposed by Ross states that the choice of debt-to-equity ratio is not based on the concept of an optimal capital structure, but rather influenced by the company's desire to convey certain signals to investors. A

company perceived as profitable may increase its debt proportion beyond the optimal level as an effort to raise its stock price and shape market perceptions of higher future growth potential (Ross, as cited in Dao & Ta, 2020).

Firm Value

According to Imronudin et al. (2022), firm value can be represented by either book value or market value. Market value refers to the product of a company's stock market price multiplied by the total number of shares outstanding. Therefore, a company's value will also increase if its stock price rises. A high firm value is generally desired by the company's owners, as it leads to greater wealth for stakeholders. Company management must be able to maximize firm value when the company enters the market. The market value indicator of a company's shares influences investment prospects in shaping the firm's overall value.

Capital Structure

According to Almomani et al. (2022), capital structure can be defined as the overall resources used to finance a company's assets. Capital structure is understood as a form of long-term financing employed by a company, measured through the comparison between long-term debt and equity. Equity funding can be obtained through the issuance of shares, while debt funding is sourced through borrowing from banks (Sudana, as cited in Nurhayati & Kartika, 2020).

1. Capital Structure Approach

According to Sudianto et al. (2022), the capital structure approach includes:

a) Net Income Approach. The more long-term debt is used to finance the business, the greater the firm's value and the lower its cost of capital. Thus, a company that maximizes the use of debt will achieve an optimal capital structure.
b) Traditional Approach. The traditional approach states that an ideal capital structure enables a business to enhance its firm value.

2. Factors Affecting Capital Structure

According to Agus Sartono (as cited in Sudianto et al., 2022), managerial decisions regarding capital structure can be influenced by several factors:

a) Sales Level. Sales stability within a company reflects cash flow stability, which allows the company to more freely utilize debt financing compared to when sales are unstable.
b) Asset Tangibility. A large number of fixed assets can be used as collateral to obtain substantial debt financing.
c) Growth Opportunity. Companies with high growth rates should not distribute profits as dividends but rather allocate them to fund investment activities. This is due to the significant funding needs required for company expansion.

3. Capital Structure Ratio

The use of solvency or leverage ratios is tailored to the company's objectives. This means that companies can use leverage ratios in their entirety or a portion of each of the existing solvency ratios. Capital structure can be calculated using one of the financial leverage ratios, the Debt-to-Equity Ratio (DER). The formula is as follows:

$$\text{DER} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Capital Intensity

According to Putri et al. (2025), capital intensity refers to the extent of capital investment, both financial and physical, required to produce a certain unit of output. This concept is important for investors as it provides insight into how much capital an entity needs to generate revenue or profit. It helps investors assess the company's capital efficiency and understand the investment implications.

According to Pilanoria (as cited in Armiawan & Achyani, 2024), capital intensity is considered a form of financial decision made by company management to increase profitability. It also reflects the amount of capital needed by a company through sales or the acquisition of fixed assets.

From the explanations above, capital intensity can be understood as a company's strategic decision through its management on how much capital in the form of assets is required to generate profit. The formula for Capital Intensity (CI):

$$\text{CI} = \frac{\text{Total Assets}}{\text{Revenue}} \times 100\%$$

Cash Holding

According to Firmansyah et al. (2020), cash holding refers to the cash or cash equivalents retained by a company to meet various operational and strategic needs. Determining the appropriate amount of cash to hold is essential, as cash is a key component of working capital that supports daily operations. Holding excessive cash for too long can expose the company to risks beyond its control, such as currency depreciation, and may lead to losses due to inefficient use of funds. Conversely, if the company does not have sufficient cash to meet unexpected obligations, its liquidity position may be compromised.

According to Putri & Lisiantara (2022), cash holding is a current asset that can be used at any time for operational activities as well as other purposes, such as dividend distribution, share buybacks, or future investment opportunities. From the above explanations, cash holding can be understood as the cash retained by a company that can be used to support its operational activities and strategic needs.

Formula for Cash Holding (CH):

$$\text{CH} = \frac{\text{Cash And Cash Equivalents}}{\text{Total Assets}}$$

Conceptual Framework

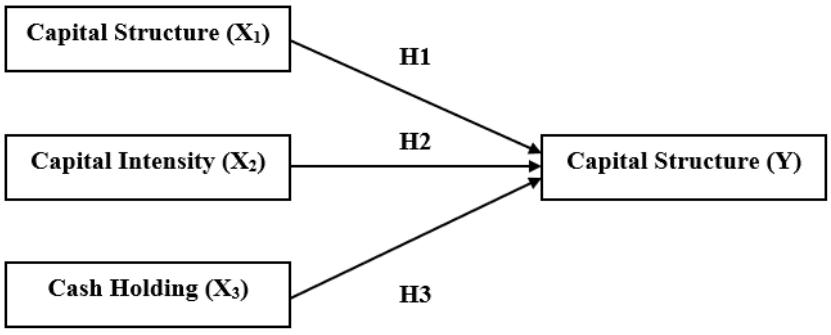

Figure 3. Conceptual Framework

Information:
The hypotheses in this study are as follows:
H1 : Capital Structure has a significant negative effect on Firm Value.
H2 : Capital Intensity has a significant positive effect on Firm Value.
H3 : Cash Holding has a significant positive effect on Firm Value.

Method

This research is a quantitative explanatory study. The selected companies are 60 transportation and logistics listed companies on the Indonesia Stock Exchange (IDX) for the 2020-2024 period, using panel data. This study aims to identify factors influencing firm value (dependent variable), such as capital structure, capital intensity, and cash holdings, as independent variables. The approach used in this study is quantitative research using panel data regression analysis.

The study uses secondary data from the annual financial reports of transportation and logistics listed companies on the IDX for the 2020-2024 period. Furthermore, the data sources are supported by various scientific papers,

journals, publications, and previous research. The secondary data required are the financial reports and annual reports of transportation and logistics listed companies on the IDX for the 2020-2024 period. The company's financial reports must be able to provide the data needed for the variable research. Data collection techniques for the study were collective and observational, using the financial reports of transportation and logistics listed companies on the IDX for five periods, from 2020-2024. Data collection was conducted through documentation and literature studies. Documentation obtained data from available literature. Data were obtained from websites.www.idx.co.id.

The sample for this study consisted of 60 transportation and logistics listed companies that were or are currently listed on the Indonesia Stock Exchange (IDX) for the 2020-2024 period. Purposive sampling was used to determine the sample based on specific criteria because not all transportation and logistics listed companies are still listed on the IDX and have complete financial reports for the past five years in rupiah. The following are the sample criteria for this study:

1) Transportation and logistics listed companies on the IDX consistently in the 2020-2024 period.
   The reason is that companies that are no longer listed on the IDX do not have the desired data.
2) Transportation and logistics listed companies on the IDX consistently upload their annual financial reports for 2020-2024.
   The consideration is because not all companies report their annual finances.
3) Transportation and logistics listed companies on the IDX consistently did not experience capital deficiencies in their financial reports in 2020-2024.
   The consideration is because the ratio used is in the form of *debt-to-equity* ratio (DER), which is usually used if the listed companies have positive equity.
4) Transportation and logistics listed companies on the IDX consistently submitted financial reports in rupiah for 2020-2024.
   The reason for not including the company's financial reports in dollar exchange rates is that when the dollar exchange rate is calculated in rupiah exchange rates, it does not explain the actual conditions at that time.
5) Transportation and logistics listed companies on the IDX have share price reports for the 2020-2024 period.
   The reason is that not all companies are listed on the IDX every year.

Currently, 17 transportation and logistics listed companies meet the desired sample criteria for the five-year period 2020-2024. Using the data aggregation method, the resulting observational data is 17 companies x five years = 85 data.

Table 1
Research Sample

No	Information	Amount	Size
1	Transportation and logistics listed companies that were and are still listed on the IDX in the 2020-2024 period	60	Company
2	Transportation and logistics listed companies that are not listed on the IDX consistently in the 2020-2024 period.	(35)	Company
3	Transportation and logistics listed companies on the IDX have not consistently uploaded their annual financial reports for 2020-2024.	(1)	Company
4	Transportation and logistics listed companies on the IDX are experiencing a capital deficiency in financial reports from 2020-2024.	(3)	Company
5	Transportation and logistics listed companies on the IDX consistently did not prepare financial reports in rupiah exchange rates in 2020-2024.	(4)	Company
6	Transportation and logistics listed companies on the IDX that did not have share price reports during the 2020-2024 period.	(0)	Company
	The number of listed company’s samples used in the study.	17	Company
	Research period	5	Year
	Total research observations	85	Sample

Source: processed data

The list of listed companies used as samples is:

Table 2
List of Sample Listed Companies

No	Company name	Company Code
1	Mineral Resources Mandiri Tbk.	ACTION
2	Adi Sarana Armada Tbk.	ASSA
3	Blue Bird Tbk.	BIRD
4	Batavia Prosperindo Trans Tbk.	BPTR
5	Jaya Trishindo Tbk.	HELI
6	Armada Berjaya Trans Tbk.	JAYA
7	Krida Network Nusantara Tbk.	KJN
8	Eka Sari Lorena Transport Tbk.	LRNA
9	Mitra International Resources Tbk.	MIRA
10	Nelly Dwi Putry Tbk Shipping.	NELY
11	Prima Globalindo Logistics Tbk.	PPGL
12	Satria Antaran Prima Tbk.	SAPX
13	Golden Combat Shipping Tbk.	TMAS
14	Trimuda Nuansa Citra Tbk.	TNCA
15	Transkon Jaya Tbk.	TRJA
16	Guna Timur Raya Tbk.	TRUCK
17	WEHA Transportation Indonesia Tbk.	WEHA

Source: data processed from idx.co.id

Panel Data Regression. There are three panel data regression models tested, namely the *pooled ordinary least squares* (*Pooled* OLS), fixed effect model (FEM), and random effect model (REM).

Table 3
Operational Definitions and Measurement of Variables

Variables	Definition	Formula	Measuring
Capital Structure	According to Oktiwiati & Nurhayati (2020), capital structure is the balance between total short-term liabilities and permanent long-term liabilities, preferred stock, and common stock. It is measured using the debt-to-equity ratio (DER).	The formula used by Almomani et al. (2022), Ferriswara (2022) and Imronudin et al. (2022) to calculate the capital structure: $\text{DER} = \frac{\text{Total Debt}}{\text{Total Equity}}$ Information : DER: Debt to Equity Ratio Total Debt: Total Debt Total Equity: Total Equity	Ratio
Capital Intensity	According to Freshillya et al. (2025), capital intensity indicates how much money is invested in assets to support a company's operational activities.	The formula used by Lee & Xiao (2011), Lehenchuk et al. (2023), and Putri et al. (2025) to calculate capital intensity:	Ratio

Variables	Definition	Formula	Measuring
		$CI = \frac{\text{Total Assets}}{\text{Revenue}}$ Information : CI: capital intensity	
Cash Holding	According to Prameswari & Ratnaningsih (2023), cash holding is a company's cash that is usually used for investing or distributed to investors.	The formula used by Firmansyah et al. (2020), Habib et al. (2021), and Widianingrum & Dillak (2023) to count cash holding: $CH = \frac{\text{Cash And Cash Equivalents}}{\text{Total Assets}}$ Information : CH: cash holding	Ratio
Firm Value	According to Agustianingrum et al., (2023), firm value is the performance of a company in the capital market related to the response of investors regarding information published by the company.	The formula used by Almomani et al. (2022), Agustianingrum et al. (2023) and Wardoyo & Fauziah (2024) to calculate the firm value: Tobin's Q= $\frac{EMV+Debt}{\text{Total Assets}}$ Information : Tobin's Q: firm value EMV: equity market value TA: total assets D : debt (book value of total debt)	Ratio

Source: data processed by the author from previous research articles.

Results and Discussion

Results
Descriptive Statistics

In this study, the variables used in descriptive statistical testing are capital structure, represented by the code CS; capital intensity, represented by the code CI; cash holding, represented by the code CH; and firm value, represented by the code FV. The results can be seen through descriptive statistics, including the average value, standard deviation, minimum value, and maximum value. The following is an overview of the descriptive statistical results using STATA 17:

Table 4
Descriptive Statistics Results in STATA 17

Variable	*Mean*	*Std. dev.*	*Min*	*Max*
FV	35.78272	87.44347	0.3041979	336.8938
CS	0.8356212	0.8149066	0.0679804	3.661827
CI	2.299578	1.904832	0.4220513	10.57231
CH	0.0772709	0.0825958	0.0014285	0.3222572

Source: STATA 17 processing results for 2025

1) The results obtained from descriptive statistics show that the average value of FV is 35.78272, while the standard deviation value is 87.44347. In addition, the minimum value of FV is 0.3041979 and the maximum value of FV is 336.8938. This indicates that transportation and logistics listed companies experience a standard deviation that is greater than the average value, which can indicate the occurrence of significant data variable distribution or significant variation in FV data.
2) The results obtained from descriptive statistics show that the average value of CS is 0.8356212, while the standard deviation value is 0.8149066. In addition, the minimum value of CS is 0.0679804 and the maximum value of CS is 3.661827. This indicates that transportation and logistics listed companies experience a standard deviation that is Smaller than the average value, which can indicate the occurrence of less significant data variable distribution or insignificant variations in CS data.
3) The results obtained from descriptive statistics show that the average value of CI is 2.299578, while the standard deviation value is 1.904832. In addition, the minimum value of CI is 0.4220523 and the maximum value of CI is 10.57231. This indicates that transportation and logistics listed companies experience a standard deviation that is smaller than the average value, which can indicate the occurrence of less significant data variable distribution or insignificant variation in CI data.
4) The results obtained from descriptive statistics show that the average value of CH is 0.0772709, while the standard deviation value is 0.0825958. In addition, the minimum value of CH is 0.0014285 and the maximum value of CH is 0.3222572. This indicates that transportation and logistics listed companies experience a standard deviation that is greater than the average value, which can indicate the occurrence of significant data variable distribution or significant variation in CH data.

Panel Data Regression Model
Pooled Ordinary Least Squares (Pooled OLS)

Table 5
Results Pooled Ordinary Least Squares (Pooled OLS) in STATA 17

Variable	*Coefficient*	*Pro. t*	*R2*	*Prob. F*
CS	-0.8665684	0.938		
CI	1.234711	0.816	0.1332	0.0087
CH	398.4553	0.002		

Source: STATA 17 processing results for 2025

Fixed Effect Model (FEM)

Table 6
Results Fixed Effect Model (FEM) in STATA 17

Variable	*Coefficient*	*Pro. t*	*R2*	*Prob. F*
CS	-19.93441	0.017		
CI	-1.278093	0.573	0.0670	0.0023
CH	92.1307	0.009		

Source: STATA 17 processing results for 2025

Random Effect Model (REM)

Table 7
Results Random Effect Model (REM) in STATA 17

Variable	*Coefficient*	*Pro. t*	*R2*	*Prob. F*
CS	-9.597434	0.016		
CI	-1.439215	0.513	0.0725	0.0007
CH	97.07893	0.004		

Source: STATA 17 processing results for 2025

Panel Data Regression Model Test

To determine the best model between the pooled ordinary least squares (*Pooled* OLS) and fixed effects models (FEM), the first step is to conduct a Chow test. A HauCSan test is then performed if the Chow test results are in the form of a fixed effects model (FEM). The Hausman test is then performed if the results of the Chow test are in the form of a fixed effects model (FEM). The results of the regression model selection test are as follows:

Chow Test

Table 8
Chow Test Results in STATA 17

Test Summary	*Prob*> F
F(16, 65) = 207.21	0.0000

Source: STATA 17 processing results for 2025

Based on the Chow test conducted in STATA 17 software on the regression equations between capital structure (CS), capital intensity (CI), and cash holding (CH) on firm value (FV), the probability value is 0.0000, or less than 0.05. Therefore, H0 is rejected and H1 is accepted. This indicates that the best panel data regression model is the fixed effects model (FEM). Next, a Hausman test will be conducted to determine the panel data regression model to be selected.

Hausman test

Table 9
Hausman Test Results in STATA 17

Test Summary	*Prob*> chi2
chi2(3) = 0.78	0.8551

Source: STATA 17 processing results for 2025

Based on the Hausman test conducted in STATA 17 software on the regression equations between capital structure (CS), capital intensity (CI), and cash holdings (CH) on firm value (FV), the probability value is 0.8551, or greater than 0.05. Therefore, H0 is accepted and H1 is rejected. This indicates that the selected panel data regression model is the random effects model (REM).

Statistical Test
F test

Table 10
F-Test Results in STATA 17

Wald chi2(3)	Prob > chi2
17.11	0.0007

Source: STATA 17 processing results for 2025

The influence of independent variables on dependent variables, simultaneously with an F table of 2.717, is as follows:
The calculated F value from Wald chi2(3) is 17.11 > F table of 2.717, and the probability value is 0.0007 < 0.05. Therefore, the variables of capital structure, capital intensity, and cash holding have a simultaneous effect on firm value.

t-test

Table 11
t-Test Results in STATA 17

FV	*Coefficient*	*Standard Error*	z	P >|z|
CS	-9.597434	3.994488	-2.40	0.016
CI	-1.439215	2/199071	-0.65	0.513
CH	97.07893	33.74031	2.88	0.004
_cons	39.61075	22.51876	1.76	0.079

Source: STATA 17 processing results for 2025

The regression equation obtained based on table 11 is:

FV = 39.61075 + (-9.597434) CS+ (-1.439215) CI+ (97.07893) CH

The effect of the independent variable on the dependent variable partially with a t table of 1.989, is as follows:

1) The results of the t-test on the CS (X1) variable obtained a calculated t value of -2.40 < t table of 1.989 and a probability value of 0.016 < 0.05, so the capital structure variable has an effect on the firm's value (H0 is accepted and H1 is rejected). The conclusion obtained is that the first hypothesis is accepted, with the statement that the capital structure has a negative effect on the firm's value.
2) The results of the t-test on the CI variable (X2) obtained a calculated t value of -0.65 < t table of 1.989 and a probability value of 0.513 > 0.05, so the capital intensity variable has no effect on the firm's value (H0 is rejected and H1 is accepted). The conclusion obtained is that the second hypothesis is rejected, with the statement that capital intensity has no effect on the firms' value.
3) The results of the t-test on the CH (X3) variable obtained a calculated t-value of 2.88 > t-table of 1.989 and a probability value of 0.004 < 0.05, so the cash holding variable has an effect on the firm's value (H0 is accepted and H1 is rejected). The conclusion obtained is that the first hypothesis is accepted with the statement that cash holding has a positive effect on the firm's value.

Analysis of the Coefficient of Determination (R2)

Table 12
Results of the Analysis of the Coefficient of Determination (R2) in STATA 17

R-Squared Overall
0.0725

Source: STATA 17 processing results for 2025

The overall R-squared value is 0.0725, or 7.25%. This coefficient of determination indicates that the capital structure, capital intensity, and cash holding variables are able to explain 7.25% of the firm's value. The remaining 82.75% (100% - the overall R-Squared value) is explained by other variables not included in this research model.

Discussion
The Influence of Capital Structure on Firm Value

Capital structure is a crucial element in corporate financial decision-making, relating to the proportion of debt to equity in financing operational and investment activities. In signalling theory, financing decisions are considered a form of communication that conveys information to investors about the company's future condition and prospects (Subramaniam et al., 2011).

Based on the results of the t-test in Table 11, it is known that the capital structure (CS) variable has a coefficient value of -9.597434, a calculated t-value of -2.40, with a probability of 0.016, which is CSaller than the significance level of 0.05. This indicates that capital structure has a significant negative effect on firm value. Statistically, this means that every one unit increase in capital structure (in other words, the higher the proportion of debt in the capital structure), will reduce the company's value by 9.597434. The calculated t-value is smaller than the t-table (-2.40 <1.989), indicating that the first hypothesis stating that capital structure has a negative effect on firm value is accepted.

This finding aligns with signalling theory in corporate finance. An excessively high capital structure (high debt relative to equity) can send a negative signal to the market that a company faces high financial risk or liquidity difficulties. This can erode investor confidence and lead to a decline in the company's value (Jiao, 2010).

Conversely, investors tend to favor companies with balanced capital structures or healthy debt ratios, as they are perceived as being able to manage financial risks effectively. Therefore, excessive use of debt can negatively impact market perception and firm value.

The results of this study support previous studies that found that capital structure has a significant negative effect on firm value, such as those by Abdillah & Situngkir (2021), Supeno et al. (2022), and Yusuf & Syarif (2021). They concluded that a high level of capital structure (leverage) can reduce firm value due to increased bankruptcy risk and agency costs.

The influence of capital structure on firm value also depends on the type of business or company. When the capital structure is at the upper threshold or uses too much debt, it can increase the risk of bankruptcy. Furthermore, investors can assess the company's passive management strategy. Furthermore, when the capital structure is at the lower threshold or has too little or no debt, it can indicate a company's overreliance on equity and concerns about loan interest payments. However, when the capital structure is at an optimal level, it can lead to stable loan payments and competent management in managing risk (low bankruptcy risk).

Overall, these results demonstrate the importance of management in designing an optimal capital structure, taking into account the company's capacity to repay debt as well as the impact of market perception on these financing decisions.

The Influence of Capital Intensity on Firm value

Capital intensity. This ratio illustrates the extent to which a company invests in fixed assets to run its operations. This ratio indicates the amount of fixed assets required to generate revenue and is typically high in capital-intensive sectors such as transportation or heavy manufacturing. Theoretically, investment in productive fixed assets can improve a company's efficiency and performance, ultimately boosting its value (Irawan et al., 2022).

However, based on the t-test results in Table 11, the capital intensity (CI) variable has a coefficient value of -1.439215, with a calculated t-value of -0.65 and a probability value of 0.513, which is much greater than the 0.05 significance level. Thus, it can be concluded that capital intensity does not significantly influence firm value in this study.

The calculated t-value, which is smaller than the t-table (-0.65 < 1.989), indicates that the second hypothesis is rejected. Although theoretically, capital intensity has the potential to increase firm value, these results indicate that in the context of the research sample, this variable does not have a significant influence on firm value. Several possible causes of this insignificance include: unproductive fixed assets, thus not optimally contributing to the company's financial performance. Inefficiency in asset utilization, such as idle or underutilized equipment. Dependence on external funding sources creates a cost burden without increasing value.

From a signalling theory perspective, high investment in fixed assets should send a positive signal to investors regarding the company's long-term prospects. However, if this investment isn't accompanied by optimal operational efficiency and performance, the signal risks will be ignored by the market.

The results of this study support previous studies that found that capital intensity has no significant effect on firm value, such as those by Natali & Herawaty (2020), Natalia & Bertuah (2022), and Supia et al. (2021).

The Influence of Cash Holding on Firm value

Cash holding. Cash holdings indicate the size of a company's cash reserves. Companies hold cash for various purposes, such as investment, short-term debt repayment, or addressing economic uncertainty. In signalling theory, sufficient cash holdings are often interpreted as a positive signal that a company is in a healthy financial position and ready to face future opportunities or risks.

Based on the t-test results in Table 11, the cash holding (CH) variable has a coefficient value of 97.07893, with a calculated t of 2.88, and a probability value of 0.004, which is smaller than 0.05. This indicates that cash holding has a significant positive effect on firm value. This means that the greater the cash reserves a company has, the higher the company's value is reflected in market response or growth potential. The calculated t value is greater than the t table (2.88 > 1.989), and the very small p value strengthens the belief that the third hypothesis is accepted.

These results are consistent with signalling theory and support previous research, such as that of Emanuel et al. (2022), Halim (2022), and Anandita & Septiani (2023), where cash reserves reflect a company's financial flexibility

and ability to respond to investment opportunities or cover liabilities without relying on external financing. Investors perceive companies with high cash holdings as financially resilient.

However, it's important to note that excessive cash holdings without a clear plan for their use can raise questions from shareholders about management's efficiency in allocating resources. The impact of cash holdings on firm value also depends on the type of business or company. When cash holdings exceed the threshold, or too much cash or cash equivalents are held, they can result in unproductive cash or cash not being used for investments that have the potential to generate greater profits for the company. Furthermore, investors can assess a passive strategy by company management. Furthermore, when cash holdings fall below the threshold, or too little cash or cash equivalents are held, they can lead to a cash crunch and impair the company's ability to repay short-term debt. However, when cash holdings are at an optimal level, they can lead to productivity in investment activities, timely payment of obligations, and meeting routine operational needs. A balanced approach to cash is essential to avoid inefficiency (Ardianto & Sulaiman, 2024).

Limitations

This research is limited to analyzing transportation and logistics listed companies that meet the sample criteria. Only four variables are used: capital structure, capital intensity, and cash holdings on firm value. The research period is limited to five periods, from 2020 to 2024.

Conclusion

This study aimed to determine whether capital structure, capital intensity, and cash holdings influence firm value in transportation and logistics listed companies. Conclusions drawn from the panel data regression analysis include: Capital structure has a significant negative partial effect on firm value. This indicates that the higher the proportion of debt in a company's capital structure, the lower its firm value. This finding suggests that excessive debt usage may send negative signals to investors and increase the company's financial risk. The effect of capital structure on firm value also depends on the nature or type of the company. When capital structure reaches the upper threshold (i.e., too much debt), it can increase the risk of bankruptcy and signal passive management strategies. On the other hand, when capital structure is at the lower threshold (i.e., too little or no debt), it may indicate over-reliance on internal funding and concern over the ability to service debt. However, when capital structure is at an optimal level, it can indicate well-managed debt repayments and competent risk management, resulting in lower bankruptcy risk. Capital intensity has no significant partial effect on firm value. This suggests that the amount of investment in fixed assets does not directly affect firm value within the sample of this study. This could be due to fixed assets that are not yet productive or have not yet contributed optimally to the company's performance.

Cash holding has a significant positive partial effect on firm value. This means that companies with adequate cash reserves are perceived as more valuable by investors, as they are considered better able to manage risk and seize future business opportunities. This finding supports the signaling theory, which states that cash holdings can serve as a positive signal of a firm's financial health. The effect of cash holding on firm value also varies based on the type of company. When cash holding reaches an upper threshold (i.e., excessive cash or cash equivalents), it may indicate unproductive funds or a lack of investment, which can be interpreted by investors as a passive management strategy. Conversely, when cash holding is too low, it can result in a cash crisis and impair the company's ability to meet short-term obligations. However, when cash holding is at an optimal level, it supports productive investment activities, timely debt repayments, and the smooth running of daily operations.

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