Application Of The Capital Asset Pricing Model (Capm) Method As A Basis For Decision Making To Invest In Shares In The Road Transportation Sector

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Abstract- — *The purpose of this study is to determine the types of stocks that are undervalued and overvalued based on stock returns and risks when making stock investment decisions. This research uses the Capital Asset Pricing Model (CAPM) method. This study analyzes the shares of companies in the road transportation sector listed on the Indonesia Stock Exchange (IDX) for the period November 2022 to October 2023. This study took 7 company stocks as samples. The results show that the 7 company stocks fall into the undervalued category because their individual stock returns are greater than the expected rate of return, and none of the stocks fall into the overvalued or inefficient category.*
Keywords— CAPM; stock returns; risk; IDX; road transportation

INTRODUCTION

Investors in the investment world must be able to see promising investment opportunities so that they can generate an ideal rate of return with minimal risk. Under balanced market conditions, equilibrium models can help investors determine their investments in the capital market. One such model is the Capital Asset Pricing Model (CAPM), which can relate the expected return of a risky asset to the risk of that asset.

It is expected that the CAPM helps investors describe complex market conditions, reduce investment risk, and estimate the amount of return earned. CAPM also aims to assist them in making stock selections and minimizing risky investments.

Stocks that have a lower expected return than the actual return will be preferred by rational investors. "Efficient stocks can be determined by choosing a certain level of expected return, then minimizing the risk or minimizing a certain level of risk, then maximizing the expected return" (Tandelilin, 2010). Due to the low level of individual returns compared to expected returns, stocks that are considered inefficient should be avoided. In addition, CAPM can assist investors in determining the risk of a portfolio that cannot be diversified and comparing it with the predicted rate of return.

The stated rate of return and the level of risk have a linear and positive relationship. The Beta (β) variable indicates the level of risk, which shows the sensitivity of the stock in CAPM. The larger *beta of* the stock, the greater the risk contained in it. The market rate of return used is the average rate of return of investment opportunities in the capital market, or the market index.

This research is taken based on data available on the Indonesia Stock Exchange (IDX). This study uses the CAPM method to determine the types of stocks that are classified as undervalued and overvalued, based on the level of stock returns and their risks, as a consideration in returning investment decisions. This research was conducted on the shares of road transportation companies on the Indonesia Stock Exchange (IDX) for the period November 2022 to October 2023. The selection of road transportation objects is due to the various policies issued by the government to carry out renewal and development in the transportation sector. Research & Consulting Manager of Infovesta Utama Nicodimus Kristiantoro said the performance of the IDX sector Road transportation & Logistics sector 1-year performance grew 3.57%. Drivers of road

transportation sector performance include the revocation of PPKM throughout Indonesia, as well as the sentiment of the NATARU (Christmas and New Year) holiday encouraging increased public mobility. On the other hand, the decline in non-subsidized fuel prices is a positive catalyst for the road transportation sector. The easing of global benchmark oil prices is expected to reduce the price of subsidized fuel. Future potential in the road transportation sector has good prospects, driven by the start of the campaign period this year, which can encourage public mobility (Nico, 2023).

GAMBAR I. Market Data by Stock List

Source : idx.co.id (data processed)

Based on the description above, the authors are interested in conducting research with the title: Application of the Capital Asset Pricing Model (CAPM) Method as a Basis for Stock Investing Decisions in the Road Transportation Sector.

RESEARCH OBJECTIVES

The purpose of this study is to apply the CAPM method to determine the types of stocks that are classified as undervalued and overvalued, based on the level of stock returns and their risks, as a consideration in making investment decisions. This research will be conducted on the shares of road transportation sector companies on the Indonesia Stock Exchange (IDX) for the period November 2022 to October 2023.

LITERATUR REVIEW

Bagian ini berisi analisis dan diskusi. Hasil penelitian hendaknya dituliskan secara jelas dan padat. Diskusi hendaknya menguraikan arti pentingnya hasil penelitian, bukan mengulangi. Hindari penggunaan sitasi dan diskusi yang berlebihan tentang literatur yang telah dipublikasikan.

Investment

Investment is the expenditure of money or other resources in an effort to gain future returns. The main objective of investing is to increase the value or earn a return on the money or assets invested. The level of risk associated with an investment varies depending on the type of investment chosen. Investors usually expect a return on their investment in exchange for their risk, which can be income, capital gains, or both. These returns can cover a variety of objectives, such as retirement planning, wealth enhancement, passive income, or achieving other long-term financial goals.

To reduce risk and increase the chances of investment success, it is important to plan and conduct a careful analysis before making an investment. This analysis should consider things like financial goals, risk tolerance, investment time horizon and diversification.

Stocks

One form of ownership that one can have in a company is shares, also known as equity or capital stock. Owning a share indicates that one owns a small part of the company, which is shown in the form of an electronic certificate or share sheet. A stock exchange is a place where stocks can be traded. Well-known stock exchanges in the United States include the New York Stock Exchange (NYSE) and NASDAQ. In the secondary market, investors can buy and sell stocks through stockbrokers or online trading platforms. Whether planning for retirement or diversifying an investment portfolio, investing in stocks can be an important component of one's financial strategy. However, it is important to remember that investing in stocks also involves risk and stock prices can change. One should do research and understand the stock market before investing in stocks.

Investment Return

The rate of return on investment, also known as return on investment (ROI), is a measure used to evaluate the extent to which an investment generates profit or income when compared to the costs incurred for the investment. ROI is a percentage that illustrates the efficiency and productivity of the investment. To assess the performance of their investments, individuals, companies, and organizations use this metric, which is one of the key metrics in financial analysis.

Investment Risk

Investment risk is the possibility that you will lose money or change the value of your investment. When you invest, you face different types of risks that can affect your investment results, so it's important to understand investment risk when making investment decisions.

It is important to remember that no investment is risk-free; all investments carry risk. One common way to reduce risk is to diversify an investment portfolio, which means investing in a variety of assets. The goal of investment management is to achieve a balance between the level of risk and the level of return that suits your financial goals and your risk tolerance. Careful research and planning can also help you discover and better manage investment risks.

Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM) is a financial model used to calculate the expected rate of return of an investment based on the level of systematic risk or market risk. The model helps investors and financial analysts in assessing whether the investment is profitable enough considering the risks involved. In the CAPM, the expected rate of return of an investment (also known as the expected rate of return or the required rate of return) can be calculated using the following formula:

$$R_i = R_f + \beta_i(R_m - R_f)$$

Where:

Ri   : expected rate of return on a particular investment

Rf   : risk-free rate of return, such as the interest rate on government bonds

βi   : beta coefficient, which measures the sensitivity of an investment to changes in the overall market

Rm   : overall market rate of return

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In addition to its frequent use in portfolio analysis and investment decision-making, CAPM is particularly useful in assessing investment returns and risk. Some of the main functions of the Capital Asset Pricing Model (CAPM) are very important in the financial world, especially in investment analysis and portfolio management.

Although the CAPM has some real-world drawbacks, such as simplistic assumptions and no transaction costs, it remains an important tool in financial analysis and investment decision-making.

METHODS

This research is classified as quantitative descriptive research. Descriptive research is to make a systematic, factual, and accurate description of the facts and properties of a particular population or area (Suryabrata, 1983). The research object in this study is shares in road transportation companies on the Indonesia Stock Exchange during the period November 2022 to October 2023. The data source in this study is secondary data obtained from the Indonesia Stock Exchange, Bank Indonesia, and Yahoo Finance, in the form of monthly time series data from stock prices, and the Composite Stock Price Index (CSPI). Analysis of the application of the CAPM method in determining investment is done by:

a. Collecting stock data of road transportation companies for the period November 2022 to October 2023, namely closing price data at the end of the month.

b. Calculating the profit level of each stock (Ri)

$$R_i = \frac{P_t - P_{t-1}}{P_{t-1}}$$

c. Calculating the market rate of return (Rm)

$$R_m = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$$

d. Calculating Beta (β) of the stock

$$\beta = \sum_{t-1}^{N} \frac{(R_i - \bar{R}_i)(R_m - \bar{R}_m)}{(R_m - \bar{R}_m)}$$

e. Calculating the risk-free rate of return (Rf) through the monthly BI rate

f. Calculating the expected rate of return according to CAPM

$$E(Ri) = Rf + \beta i \ [E(Rm)-Rf]$$

Stock valuations based on individual returns and expected returns are classified as efficient stocks and inefficient stocks.

RESULTS AND DISCUSSION

This study discusses the application of the CAPM method to determine the types of stocks that are classified as undervalued and overvalued, based on stock returns and their risks, as a basis for consideration in making stock investment decisions in road transportation sector companies listed on the IDX, with the following steps: Calculate the individual stock rate of return (Ri), calculate the market rate of return (Rm), calculate the risk-free rate of return (Rf), calculate the systematic risk (β), and calculate the expected rate of return [E(Ri)].

Based on these steps, it will then be determined what investment decision to make, by comparing the individual stock rate of return (Ri) with the expected rate of return [E(Ri) to determine the types of stocks that are classified as undervalued and overvalued.

List of Companies Included in Research Sample

TABEL 1. List of Companies Included in Research Sample

Sub Industry	Code	Stock Name
Road Transportation	ASSA	Adi Sarana Armada Tbk
Road Transportation	BIRD	PT Blue Bird Tbk
Road Transportation	BPTR	PT Batavia Prosperindo Trans Tbk.
Road Transportation	LRNA	PT Eka Sari Lorena Transport Tbk.
Road Transportation	SAFE	Steady Safe Tbk
Road Transportation	TRJA	PT Transkon Jaya Tbk.
Road Transportation	WEHA	PT WEHA Road transportation Indonesia Tbk

Results of Individual Stock Return Rate Analysis (Ri)

The rate of return on individual shares can be calculated by comparing the closing price of the current month's shares denoted by month t minus the closing price of the previous month's shares denoted by month t-1 then divided by the closing price of the month t-1 shares.

Individual Stock Returns for the Period November 2022 to October 2023

TABEL 2. Individual Stock Returns for the Period November 2022 to October 2023

No.	Code	Ri
1	ASSA	0.1757
2	BIRD	0.3617
3	BPTR	-0.6847
4	LRNA	0.3381
5	SAFE	-0.2684
6	TRJA	0.1385
7	WEHA	0.3517

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The table shows that PT Blue Bird Tbk (BIRD) gets the highest individual stock return (Ri) of 0.3617. Meanwhile, PT Batavia Prosperindo Trans Tbk (BPTR) got the lowest individual stock return (Ri) of -0.6847.

Results of Market Rate of Return Analysis (Rm)

The market rate of return is the rate of return based on the development of the stock index. The market return is calculated by measuring the difference between the market index in the current month (t) and the previous month (t-1) then divided by the IHSG in the previous month (t-1).

Market Rate of Return for the Period November 2022 to October 2023

TABEL 3. Market Rate of Return for the Period November 2022 to October 2023

Date	Close	IHSG
01/11/2022	7081.31	IHSG
01/12/2022	6850.62	-0.03258
01/01/2023	6839.34	-0.00165
01/02/2023	6843.24	0.00057
01/03/2023	6805.28	-0.00555
01/04/2023	6915.72	0.01623
01/05/2023	6633.26	-0.04084
01/06/2023	6661.88	0.00431
01/07/2023	6931.36	0.04045
01/08/2023	6953.26	0.00316
01/09/2023	6939.89	-0.00192
01/10/2023	6896.29	-0.00628
17/10/2023	6939.62	0.00628
Amount		**-0.01781**

The table shows that the sum of the market rate of return (Rm) is -0.01781.

Results of Systematic Risk Analysis of Each Individual Stock (β)

Systematic Risk (β) of each Stock for the Period November 2022 to October 2023

TABEL 4. Systematic Risk (β) of each Stock for the Period November 2022 to October 2023

No.	Code	BETA
1	ASSA	0.0499
2	BIRD	1.2987
3	BPTR	1.9480
4	LRNA	1.2925
5	SAFE	0.1923
6	TRJA	4.4080
7	WEHA	3.3775

The calculation results show that the general Beta (β) value of the company's shares that are used as research samples have a high systematic risk and tend to be active in responding to changes in market prices. The table shows that PT Transkon Jaya Tbk (TRJA) has the highest Beta (β) value of 4.4080, and Adi Sarana Armada Tbk (ASSA) has the lowest Beta (β) value of 0.0499.

Risk Free (Bank of Indonesia)

The BI rate data in this study is used as an indicator in calculating the Risk-Free rate (Rf); the results of the calculation of the Risk-Free rate are as follows:

Risk-Free Rate of Return for the Period November 2022 to October 2023

TABEL 5. Risk-Free Rate of Return for the Period November 2022 to October 2023

No.	Date	BI-7Day-RR
1	19/10/2023	6.00%
2	21/09/2023	5.75%
3	24/08/2023	5.75%
4	25/07/2023	5.75%
5	22/06/2023	5.75%
6	25/05/2023	5.75%
7	18/04/2023	5.75%
8	16/03/2023	5.75%
9	16/02/2023	5.75%
10	19/01/2023	5.75%

No.	Date	BI-7Day-RR
11	22/12/2022	5.50%
12	17/11/2022	5.25%
Average		**5.71%**

The table shows that Risk Free (BI-7Day-RR) for the period November 2022 - October 2023 has an average of 5.71% or equivalent to 0.0571, with the highest value of 6% and the lowest value of 5.25%.

Expected Rate of Return Analysis Results [E(Ri)] and Classification of Investment Decision

Undervalued stocks are stocks that have individual stock returns greater than the expected rate of return (Ri) > E(Ri), while stocks that have individual stock returns less than the expected rate of return (Ri) < E(Ri) are overvalued stocks.

Expected Rate of Return for the Period November 2022 to October 2023 and Grouping of Undervalued or Overvalued Stocks

TABEL 6. Expected Rate of Return for the Period November 2022 to October 2023 and Grouping of Undervalued or Overvalued Stocks

No.	Code	Ri	E(Ri) CAPM	Result	Score	Decision
1	ASSA	0.1757	0.1720	Ri > E(Ri)	Undervalued	Buy
2	BIRD	0.3617	0.2645	Ri > E(Ri)	Undervalued	Buy
3	BPTR	-0.6847	-0.8306	Ri > E(Ri)	Undervalued	Buy
4	LRNA	0.3381	0.2413	Ri > E(Ri)	Undervalued	Buy
5	SAFE	-0.2684	-0.2828	Ri > E(Ri)	Undervalued	Buy
6	TRJA	0.1385	-0.1916	Ri > E(Ri)	Undervalued	Buy
7	WEHA	0.3517	0.0988	Ri > E(Ri)	Undervalued	Buy

Based on the results of the study, the 7 shares of the company are efficient stocks to buy. The criteria in determining investment decisions are choosing efficient stocks, stocks that have an individual return greater than the expected rate of return (Ri>ERi) while eliminating inefficient stocks, namely stocks that have an individual return value smaller than the expected rate of return (Ri<ERi).

CONCLUSION

Based on the results of the data analysis conducted, the conclusion of this study is that there is a nonlinear relationship between systematic risk and expected stock returns. The study used secondary data with a period of November 2022 to October 2023 in the road transportation sector. The research results from the highest individual stock return is BIRD

of 0.3617, while the lowest is BPTR of -0.6847. The result of the market rate of return (JCI) has an amount of -0.01781. The highest individual stock systematic risk (β) result is TRJA with a Beta (β) value of 4.4080, and ASSA has the lowest Beta (β) value of 0.0499. The risk free result (BI-7Day-RR) has an average of 5.71% or equivalent to 0.0571, with the highest value of 6% and the lowest value of 5.25%.

There are 7 company stocks that are included in the category of efficient stocks to buy. The company's stocks included in the efficient stock category include: ASSA, BIRD, BPTR, LRNA, SAF, TRJA, and WEHA stocks. These stocks have a value of Ri greater than E(Ri) or [Ri > E(Ri)]. The investment decision that investors should make is to buy these stocks.

The limitation of this study is that the calculated rate of return is only the rate of return from capital gains only, without taking into account the dividends earned during the period. In addition, the price reference calculation uses monthly price data, so the resulting return is more similar to the return from short-term investments than if the reference price was a daily or annual price.

SUGGESTION

It is hoped that this research will provide references and additional information for investors and potential investors who will invest in stocks. It is very important for investors to invest their excess funds in profitable stocks so that the risks they face can be minimized and their goal of getting the expected return can be achieved.

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