

Analysis of Investment Risk and Share Return in Coal Mining Companies Listed on IDX for The Period 2019-2021

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Abstract

This research is to determine the level of investment risk and stock returns as well as grouping efficient shares and inefficient shares of coal mining companies through the Capital Asset Pricing Model (CAPM) method for the 2019-2021 period. The research method used is descriptive method with a quantitative approach, while the data analysis method uses the Capital Asset Pricing Model (CAPM) method. The results showed that there were 8 shares of coal mining companies with a beta value (systematic risk) greater than 1 ($\beta > 1$) with a highest value of 3.10 on DOID shares, and 16 company shares with a beta of less than 1 ($\beta < 1$) with the lowest value of 0.12 on GEMS shares. The highest RI was found in HRUM shares with a rate of return of 0.07154 or 7.15%, while the lowest Ri is found in BOSS shares with an average rate of return of -0.5791 or -5.79%. The highest E(Ri) value is found in DOID shares with a value of 0.00177 or 0.18%, while the lowest E(Ri) is found in GEMS companies with a value of 0.00126 or 0.13%. There are 17 shares of coal mining companies which are classified as efficient shares consisting of shares of ADRO, BSSR, BYAN, DOID, DSSA, FIRE, GEMS, HRUM, INDY, ITMG, MBAP, MYOH, PTRO, SMMT, TOBA, and BRMS, as well as 7 inefficient stocks namely ARII, BOSS, BUMI, DEWA, GTBO, KKGI, PTBA, and SMRU. The results of the analysis of beta and expected return in this study prove that the higher the beta of a stock, the higher the expected return.

Keywords: CAPM, Investment Risk, Stock Return Rate

1. INTRODUCTION

From an economic standpoint, Indonesia is currently much better off than in 2020. Indonesia's economy grew well throughout 2021, according to the Central Statistics Agency, reaching 3.69% or better than in 2020 which showed a decline of 2.07%. One of the countries that has passed the pre-pandemic period is Indonesia.

The capital market is one of the main economic innovators of a country. The capital market itself functions as a vehicle for business actors to obtain money because they obtain funding from investors and the capitalist community. In addition, its function for the community is a means of investment in various instruments in the capital market (Listyarti, 2017: 237).

In addition, investment is needed for economic development because it is one of the main sources of economic growth. Companies rely heavily on investment (Astuti, 2018: 4). Stock offerings are an investment option that is in high demand among businesses. Companies can raise funds from the general public or investors by issuing shares, and these funds will be used for company expansion. In investing, investors or potential investors must pay attention to several factors before making an

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investment decision, especially investing in the stock market. One of them is considering the company

which is a good place to invest. Examples of good companies in where one can invest, including those with high liquidity and stock prices (Rukmini, 2019: 301).

One of the relatively most productive sectors on the IDX is mining, especially coal mining. The coal business capital market share price will be affected by the increase in coal prices in 2021, which will also encourage investors to invest in the sector. Coal prices increased by around 7.21% in September 2021. The increase reached 148.26% since the beginning of the year, from US\$ 124.25 per ton to US\$ 189.3 per ton.

In making an investment decision, risk and return are very important to note. There are some lucrative investment opportunities available today, but they are generally unhelpful from an entrepreneurial perspective. There is no discussion or disclosure regarding the magnitude of the risk of participation in the investment which may cause losses to many people or investors in the offering. The current phenomenon in society and among investors is that every time an investment offer promises high returns without taking into account potential future risks, it always gets a high response (Apriani, 2018: 2).

Uncertainty and risk are fundamental components of investing in the stock market. Risk is something investors often face. The investment choice depends not only on the expected return but also on the investor's willingness to assume and manage potential risks. Therefore, measuring the magnitude of this risk is an effort to reduce investment risk. The investment risk that arises is a form of reality that arises and is difficult to avoid but can be managed so that the risks that occur are not too high.

According to investment law, the potential risk increases as the return on investment increases. Investors need to know well how to measure the risk level of an investment (Wardani, 2020: 1). When investors are not aware of the potential risks that will occur, it is difficult for them to determine the amount of return expected from a particular investment or portfolio.

When making an investment, investors are looking for large returns with minimal risk. The CAPM (Capital Asset Pricing Model) approach, which is considered the most objective tool for assessing investment feasibility and predicting stock price changes.

According to research by Pratiwi, Lasmanah, and Azib (2022), the CAPM model is more accurate than the Fama French Three Factor Model (FFTFM) and the Arbitrage Pricing Theory (APT) model. Between CAPM, APT and FFTFM, CAPM can offer lower Mean Absolute Deviation (MAD) figures. When the MAD value is used as a measure of investment risk, CAPM has lower investment risk for investors than APT and FFTFM. The model that can be used to determine the relationship between the level of risk and the rate of return is the Arbitrage Pricing Theory (APT), while the model that explains that there are three factors to measure expected returns, namely by using market factors, size and book to market is called the Fama French Three Factor Model (FFTFM) (Pratiwi, Lasmanah & Azib, 2022: 604). In addition, research by Rantemada, Pelleng, and Mangindaan (2021) shows that the CAPM is more accurate than the APT approach because it can provide greater risk because the CAPM's Mean Absolute Deviation (MAD) value is smaller than the APT.

The financial model known as CAPM expresses the relationship between risk and return in simple terms. (Nasuha, 2013: 4). The main objective of the CAPM method is to calculate the expected return on the least risky investment. By using the CAPM method, inefficient and efficient stocks can be distinguished. Because the predicted return is less than the actual return, efficient (undervalued) stocks are a profitable investment. On the other hand, equity that is not efficient (overvalued) is a stock that is in the market and has an expected rate of return that is greater than the actual return. Investors can use this evaluation as a basis for future investment decisions (Nasuha, 2013: 4).

2. Theoretical Review

2.1 The capital market

The capital market is defined as a market for various tradable long-term financial instruments issued by public and private companies (Husnan, 2015: 3). By facilitating the trading of financial products such as stocks and bonds through a network of dedicated brokerage houses. It can be said that those who need funds (business) and those who have excess funds can be found in the capital market. This capital market functions as a binding agreement between investors and businesses or investors through long-term agreements with government bodies.

2.2 Investment

Investment is the activity of purchasing financial assets with the hope that they will eventually increase in value and can be sold at a higher price (Hardiwinoto, 2018: 1). Investments based on assets are divided into 2, namely:

- a. Real assets are investments with tangible or tangible assets such as gold, land, works of art and real estate.
- b. Financial assets are investments in the financial sector such as stocks, bonds, mutual funds and deposits.

2.3 Capital Asset Pricing Model (CAPM)

The people who first introduced the CAPM model were Sharpe (1964) and Lintner (1965). Where this model is a formal model that was first used to perform pricing of an asset. Markowitz's portfolio theory, which uses the mean-variance and introduces systematic and unsystematic risk, is enhanced by the CAPM model. One of the most important tasks an investor must perform is to evaluate or predict the amount of return on a security.

This CAPM model can be expressed in the following way, in basic terms:

- a. Diversification helps reduce risk.
- b. Systematic risk is risk that cannot be diversified.
- c. Unsystematic risk is risk that can be diversified.
- d. Investors exposed to systemic risk want compensation consistently.
- e. The measure of market model beta, which reflects how the rate of return on assets (R_i) corresponds to the rate of return on the market or market returns, can be used to measure systematic risk (R_m).
- f. A risk-free asset is an asset whose return on investment is not related to market movements when the beta is zero (zero beta). Meanwhile, beta equal to one ($\beta=1$) means that the yield of this asset is very positive and correlates with market trends.

2.4 Investment Risk

In investing, investors must consider both the level of risk that can occur in these investment activities and the returns or returns when investing (Handini & Astawinetu, 2020: 5). Investment risk is divided into two categories, namely as follows :

- a. Systematic Risk, This risk is related to the general movement of the market. This risk relates to the overall changes that occur in the market. As a result of market risk, systematic risk cannot be controlled. This type of risk also cannot be eliminated by diversification and will always be there
- b. Unsystematic Risk, This risk relates to changes in the internal circumstances of the company that issues the securities. Portfolio risk can be reduced by diversifying its holdings.

2.5 Stock Return Rate

Stock return is referred to as stock income and is a change in the value of stock prices period t (current period) with period $t-1$ (previous period) ". This can be interpreted that the yield of stock

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dividends increases in proportion to the volatility of the stock market (Khoirunnisa, 2018: 21).

There are 2 types of returns, including:

a. Realized return.

Realized return calculated using historical data is the actual stock return rate. Because of its use as a measure of business performance, this type of payment is very important.

b. Expected return

Expected returns are more significant than realized returns because investors anticipate receiving them in the future

3. RESEARCH METHOD

Descriptive research with a quantitative approach is the type of research used in this study. Without comparing one variable with another, this study uses quantitative descriptive analysis to explain and understand risks and returns related to stocks using the CAPM approach. The research population consists of 28 coal mining companies listed on the Indonesia Stock Exchange (IDX) for 2019 to 2021. From this population, some companies will be used as research samples. Purposive sampling is the sampling method used to obtain a sample of 24 coal mining companies listed on the IDX for the 2019-2021 period.

The data management method used in this study is documentation using secondary data. The information used includes data on monthly closing prices for coal mining companies listed on the Indonesia Stock Exchange for the period 2019 – 2021 from www.idx.co.id, www.idnfinancials.com and www.finance.yahoo.com; JCI monthly closing price data for the period 2019 – 2021 from www.finance.yahoo.com; and reference interest rate data from Bank Indonesia, especially the BI-7 Day Reverse Repo from www.bi.go.id

The method used for data analysis is based on the Capital Asset Pricing Model (CAPM). The research data will be processed using Microsoft Excel 2010. The following are the steps in data analysis in this study:

a) Counting Stocks

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

b) Calculating Market Return (RM)

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

c) Calculate the risk-free return (Rf)

$$R_f = \frac{\sum_{i=1}^n SBI}{n}$$

d) Beta Systematic Risk (β)

$$\beta_i = \frac{n (\sum R_i R_M) - (\sum R_i) (\sum R_M)}{n (\sum R_M)^2 - (\sum R_M) (\sum R_M)}$$

e) Expected Return Rate / E (Ri)

$$E(R_i) = R_f + (R_M - R_f) \beta_i$$

f) Classifying Shares

4. RESULTS AND DISCUSSION

4.1 Analysis Results of Stock Return Rate (stock return)

There are 17 coal mining companies that have a positive average return, where these shares provide returns for investors during the study period. The highest average rate of return on coal company shares is PT Harum Energy Tbk (HRUM) with a return rate of 0.07154 or 7.15%. This average rate of return on HRUM shares shows that during the period February 2019 to December 2021 investors earned an average profit of 7.15% on HRUM company shares.

In addition, there are 7 coal mining companies that have a negative average rate of return, which means that during the study period, these shares did not provide any profit to investors. The lowest average rate of return on shares of coal mining companies is PT Borneo Olah Sarana Tbk (BOSS) with an average rate of return of -0.5791 or - 5,79%. The average rate of return on BOSS shares shows that during the period February 2019 to December 2021 investors experienced an average loss of 5,79% on HRUM company shares.

4.2 Results of Risk Free Rate Analysis (Rm)

This study uses BankIndonesia Certificates (SBI) as a risk-free asset that can be calculated by dividing BankIndonesia's monthly benchmark interest rate (BI7DRR) with the period in this study, namely February 2019 to December 2021.

The average SBI Risk Free Rate (Rf) for the period February 2019 to December 2021 is 4.42%. The lowest BI7DRR interest rate during the study period was 3.50% which occurred from February to December 2021, this determination was made so that the inflation forecast remained low and the stability of the rupiah exchange rate was maintained. While the highest BI7DRR interest rate was 6% which occurred from January to June 2019, this determination was made in an effort to maintain external stability in the Indonesian economy amid increasing global financial market uncertainty and to strengthen the attractiveness of domestic financial assets. The average risk-free rate of return during the study period is 0.001263 or 0.13%, which means that during the study period the risk-free rate of return provides a profit of 0.13%.

A high BI7DRR interest rate can increase SBI returns because this risk-free asset follows the BI7DRR reference. Because SBI is a safer investment because it is risk-free and also has higher returns, investors will be more interested if Bank Indonesia raises interest rates. However, capital market investment will also decrease. On the other hand, if Bank Indonesia lowers interest rates, returns will also decrease when they return to the capital market.

4.3 Analysis of Market Return (Rm)

The average market rate of return (Rm) during the period February 2019 to December 2021 is 0.001410 or 0.14%, meaning that the rate of return obtained by investors during the research period on the capital market is 0.14%. During the research period, the highest value for the market rate of return was 0.094417 or 9.44% which occurred in November 2020, while the lowest value was -0.167581 or -16.76% which occurred in March 2020.

During the study period, the performance of stock investment was said to be good, this was because the market return was higher than the risk-free rate of return, namely $0.001410 > 0.001263$. This causes investors to prefer investing in the capital market (stocks) compared to risk-free assets.

4.4 Results of Beta Analysis of Each Stock

There are 8 coal mining companies that have a beta greater than 1 ($\beta > 1$), namely ADRO, BOSS, DOID, FIRE, INDY, ITMG, KKG and PTRO. The highest beta was found in PT Delta Dunia Makmur Tbk (DOID) with a value of 3.10, which means that this stock experienced an average increase of 3.10 times the market increase (IHSG) during the study period. Then there

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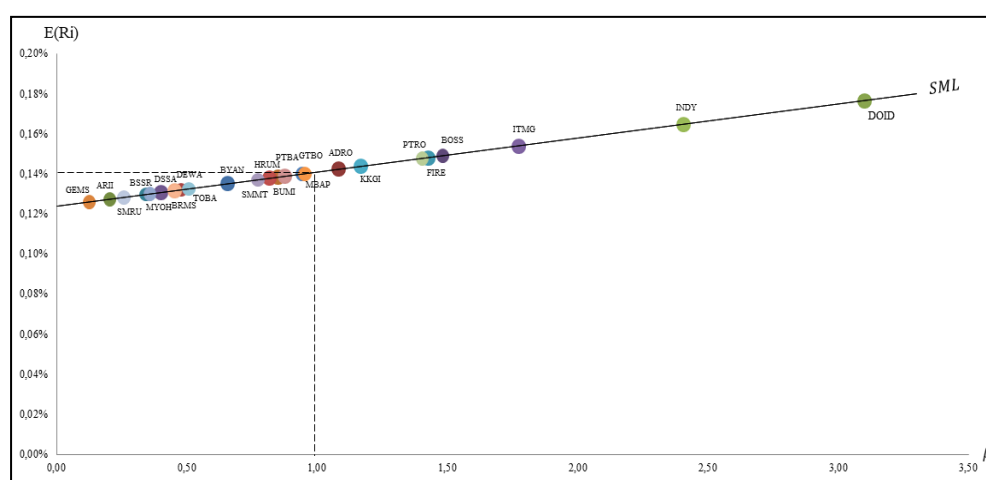
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are 16 coal mining companies with a beta value of less than 1 ($\beta < 1$), namely ARII, BSSR, BUMI, BYAN, DEWA, DSSA GEMS, GTBO, HRUM, MBAP, MYOH, PTBA, SMMT, TOBA, BRMS, and SMRU. The lowest beta is found in PT Golden Energy Mines Tbk (GEMS) with a beta value of 0.12 ($\beta < 1$), which means that during the study period this stock had very slow stock movements in following market movements (IHSG).

4.5 Analysis Results Average expected return [E(Ri)]

All coal mining companies used as research samples have a positive expected rate of return. The average expected rate of return is 0.00140, which means that investors expect a profit of 0.14% during the study period. The highest E(Ri) value is found in the company PT Delta Dunia Makmur Tbk (DOID) with an E(Ri) value of 0.00177 or 0.18%. While the lowest E(Ri) value is found in PT Golden Energy Mines Tbk with an E(Ri) value of 0.00126 or 0.13%.

4.6 Depiction of the Security Market Line



(Security Market Line chart)

SML is formed from the relationship between the beta point and E(Ri) based on the order of the smallest number. This SML has a positive slope because the movement is from the bottom left to the top right which illustrates that the greater the beta value, the greater the expected return by investors. This shows that beta has a linear/unidirectional relationship with the expected rate of return (E[Ri]).

4.7 Classification of Efficient and Inefficient Shares

There are 17 shares of coal mining companies which are efficient shares, namely ADRO, BSSR, BYAN, DEWA, DOID, DSSA, FIRE, GEMS, HRUM, INDY, ITMG, MBAP, MYOH, PTRO, SMMT, TOBA, and BRMS, as for investment decision on the stock is to buy. The company PT Harum Energy Tbk (HRUM) is one of the first ranked efficient stocks with the highest difference between Ri and E(Ri) during the study period, namely 0.07016 or 7%, which means that HRUM shares are able to provide benefits. of 7%. of level

The return investors expect. In addition, there are 7 shares of coal mining companies which are considered to be inefficient shares, namely ARII, BOSS, BUMI, GTBO, KKGI, PTBA, and SMRU, while the investment decision in these shares is to sell or not to buy these shares because there is a possibility of a decrease in the share price. . The company PT Borneo Olah Sarana Tbk (BOSS) is one of the inefficient stocks that ranks last with the lowest difference in Ri and E(Ri) during the study period, namely -0.05940, which means that investors experience a loss of 5.9% of the expected rate of return. expected. expect.

4.8 Relationship of Risk and Return of Stock (Return)

The relationship between beta (systematic risk) and the expected rate of return in this study shows a positive and unidirectional nature which proves that the higher the risk of a stock, the higher the rate of return that will be obtained. From the results of research that has been carried out, it was found that DOID shares have the highest risk level of 3.10 and also provide the highest expected rate of return of 0.00177 or 0.18% in the 2019-2021 period. Conversely, the lowest risk is found in GEMS shares with a value of 0.12 and provides the lowest expected rate of return with a value of 0.00126 or 0.13%.

Research conducted by Yovita, Lailatullia & Monica (2015), found a linear relationship between systematic risk and the expected rate of return. Where the results obtained are that MNCN shares have the highest systematic risk with a value of 2.08 and also provide the highest expected rate of return with a value of 0.009457 or 0.95%. Conversely, UNVR shares have the lowest systematic risk with a value of 0.49 and also provide the lowest expected rate of return with a value of 0.003676 or 0.37%.

Similar research was also conducted by Ferrari (2019), where the results of his research obtained a positive or unidirectional relationship between systematic risk and the expected rate of return. In his research, the highest beta is found in NAGA stock of 3.98 and also has the highest expected rate of return of 0.0115 or 1.15%. Conversely, the lowest beta is found on BBYB stock of -2.02 and also has the lowest expected rate of return of 0.0001 or 0.01%.

From several previous studies, it can be concluded that the Capital Asset Pricing Model (CAPM) method is quite accurate in predicting or determining the relationship between risk and return. From the results of the study it can also be seen that during the study period, market conditions were in a state of balance.

5. CONCLUSION

Based on research that has been carried out related to Investment Risk Analysis and Rate of Return on Shares in Coal Mining Companies Listed on the IDX for the 2019-2021 period, with a total sample of 24 shares of coal mining companies. The results that have been examined based on data analysis using the Capital Asset Pricing Model (CAPM) method using Microsoft Excel 2010 are as follows:

- a. From the results, it can be seen that there are 17 shares of coal mining companies with an average rate of return (R_i) positive and 7 shares of coal mining companies with an average rate of return (R_i) negative. The highest R_i is found in the company PT Harum Energy Tbk (HRUM) with a return rate of 0.07154 or 7.15%, while the lowest R_i is found in the company PT Borneo Olah Sarana Tbk (BOSS) with an average return rate of -0.5791 or -5.79%.
- b. Based on the research results, of the 24 shares of coal mining companies, there are 8 shares of companies with $\beta > 1$, namely ADRO, BOSS, DOID, FIRE, INDY, ITMG, KKG, and PTRO. and 16 shares of companies with $\beta < 1$ namely ARII, BSSR, BUMI, BYAN, DEWA, DSSA, GEMS, GTBO, HRUM, MBAP, MYOH, PTBA, SMMT, TOBA, BRMS, and SMRU.
- c. Based on the research results, all coal mining companies used as research samples have a positive expected rate of return. The highest $E(R_i)$ value is found in a DOID company with an $E(R_i)$ value of 0.00177 or 0.18%. While the lowest $E(R_i)$ value is found in GEMS

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companies with an $E(R_i)$ value of 0.00126 or 0.13%.

- d. From the results of the study there were 17 shares of coal mining companies which included efficient shares and the decision taken for efficient shares was to buy shares. In addition, there are 7 shares of coal mining companies which are included as inefficient shares and the investment decision taken for inefficient shares is to sell or not to buy these shares.

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