

# **Application Of The Capital Asset Pricing Model (CAPM) Method In Determining Efficient Stock Group (Study On IDX30 And Business Index-27 In Indonesia Stock Exchange)**

Nurul Rahmah Dewi<sup>1</sup>, Uhud Darmawan Natsir<sup>2</sup>, Anwar<sup>3</sup>

<sup>1</sup>, Department of Management, Faculty of Economics and Business, Universitas Negeri Makassar, Makassar, Indonesia

<sup>2</sup> Department of Management, Faculty of Economics and Business, Universitas Negeri Makassar, Makassar, Indonesia

<sup>3</sup> Department of Management, Faculty of Economics and Business, Universitas Islam Malang, Malang, Indonesia

Email : [nurulrahmah57@gmail.com](mailto:nurulrahmah57@gmail.com)

---

## ABSTRACT

The purpose of this study is to classify efficient and inefficient stocks using the CAPM method so that investors can make the right investment decisions on the IDX30 and Bisnis-27 Index on the Indonesia Stock Exchange for the 2018-2022 period. The data used in this research is secondary data of 18 samples. The findings in this study, it can be seen that the greater the systematic risk ( $\beta$ ), the smaller the expected rate of return  $E(R_i)$ . This shows that there is a non-linear or non-linear relationship between ( $\beta$ ) and  $E(R_i)$ . Because the average beta value is less than 1 which indicates that stock prices tend to rise or fall lower than the market price index or  $R_m$  in general. The criteria for determining investment decisions are choosing efficient stocks. Efficient stocks are stocks that have levels individual returns that are greater than the expected rate of return or  $[R_i > E(R_i)]$ , while eliminating inefficient stocks, namely stocks that have individual returns smaller than the expected rate of return or  $[R_i < E(R_i)]$ . The investment decisions made on efficient stocks are considering buying these shares and the decisions made on inefficient stocks are considering selling these shares.

Keywords: *IDX30, Business Index-27, Optimal Portfolio, Capital Asset Pricing Model (CAPM), Investment Decision*

---

Article History:  
Reviewed : 30-05-2023  
Revised : 04-06-2023  
Accepted : 07-06-2023

DOI Prefix :

## Introduction

Globalization in the financial sector is one of the demands of economic development in Indonesia and has an important role in driving the development of the capital market in Indonesia. The business world in Indonesia, especially the investment sector, can be said to be growing rapidly from time to time, this is indicated by the increasing number of buying and selling shares by investors that occur in the capital market. Based on data from the Central Statistics Agency (2022), Indonesia's economic performance continues to strengthen, this development is reflected in economic growth in the third quarter of 2022 which reached 5.72% (yoy), higher than the previous quarter's achievement of 5.54% (yoy).

The number of investors in Indonesia has increased every year in line with the increasing public awareness of investing, which is supported by the development of digital technology. Data from the Indonesian Central Securities Depository (KSEI) states that as of August 2022 the number of capital market investors has exceeded 9.54 million investors (KSEI, 2022). This number shot up 27.38% compared to December 2021 with 7.48 million investors. The surge in the number of capital market investors was mainly supported by the number of mutual fund investors which jumped 25.56% to 8.86 million investors in August 2022. The increase was also recorded from investors in Government Securities (SBN), which shot up 24.53% to 761,014 investors, and investors in stocks and other securities rose 19.89% to 4.13 million investors.

The large number of shares listed on the capital market makes investors have to choose carefully if they want to invest among these stocks. Therefore, the Indonesia Stock Exchange publishes a Stock Index, where the stock index is a statistical measure that reflects the price of a group of stocks that are selected based on certain criteria and methodologies and are evaluated periodically. Currently, the Indonesia Stock Exchange has 42 stock indices, including the IDX30 and the Bisnis-27 Index

As an investor, you definitely want an issuer that can provide *returns* or high returns. According to Lento et al (2019), the Capital Asset Pricing Model (CAPM) was pioneered by William Sharpe, John Litner, and Jan Mossin in 1964-1966. The CAPM model is an important part in the financial sector which is used to predict the balance of expected returns and risk of an asset in equilibrium conditions. In an equilibrium condition, the required return for a stock will be affected by the risk of the stock. Intended use of the CAPM according to Nugraheni (2018), is to provide accurate predictions regarding the relationship between the risk of an asset and the expected return, also determines the price of an asset. Therefore CAPM can be used to

estimate the profit of a security on the assumption that the capital market is efficient, that is, all assets are perfectly divisible and can be traded at any time, meaning that investors can buy and sell shares at any time.

In this case the risk that is taken into account is only systematic risk or market risk as measured by beta ( $\beta$ ). Meanwhile, unsystematic risk is irrelevant, because this risk can be eliminated by diversification. Nugraheni (2018). Therefore, the CAPM as a balance model can help to simplify the real picture of the relationship between risk and return.

## **Literature Review**

### ***Capital market***

According to Capital Market Law no. 8 of 1995, the Capital Market is an activity concerned with public offerings and securities trading, public companies related to the securities they issue, as well as institutions and professions related to securities. A meeting place for owners of capital or investors with other parties who trade stocks, bonds and other securities using securities dealer services, Wardoyo (2012:18).

### ***Stock***

Stock is one of the securities traded in the capital market. To obtain capital, a company in the form of a limited liability company (PT) receives a deposit from the owner. As proof of deposit, proof of ownership in the form of shares is issued which is handed over to the parties depositing capital. The owner of a company in the form of a limited liability company (PT) is a collection of parties who own shares, so they are called shareholders. Shares issued by a limited liability company which include the name of the owner, are called shares in the name. Rudianto (2012:284).

### ***Investment***

Investment is an alternative that can be used to increase asset value in the future. Investment can be in the form of real investment or financial investment. Real investment is in the form of facilities related to the company's production activities, such as land, buildings, equipment, machinery. Financial investment is only proof of company ownership but does not have a direct contribution to the company's production, in the form of stocks and bonds, Lento et al (2019).

### ***Optimal Portfolio***

According to Burra (2018), a portfolio is a collection of investment opportunities, where investors are faced with uncertainty. The essence of forming a portfolio is to reduce risk by means of diversification, namely allocating a number of funds to various investment

alternatives that are negatively correlated. There are three concepts needed to understand the formation of an optimal portfolio.

An efficient portfolio is defined as a portfolio that provides the greatest expected return value with a specific risk or provides the smallest risk with a definite expected return. An efficient portfolio can be determined by selecting a certain expected rate of return and then minimizing risk, Fitriyani (2020).

### ***Capital Asset Pricing Model (CAPM)***

The capital asset pricing model (CAPM) is a tool for predicting the expected balance of returns on a risky asset. CAPM was first introduced by Treynor (1961), Sharpe (1964), and Lintner (1965). *Capital Asset Pricing Model* is an equilibrium asset pricing model which states that the expected return on a particular security is a positive linear function of the sensitivity of a security to changes in its market portfolio return, Nugraheni (2018).

Based on this theory, it is necessary to consider how to determine the profit on an investment so that it can be considered feasible. One way to use the Capital Asset Pricing Model (CAPM), Liadi et al (2020).

## **Methods**

### **Experiment Research**

This type of research uses quantitative research methods. This research was conducted by collecting data in the form of numbers. The data in the form of numbers is then processed and analyzed to obtain scientific information behind these numbers (Prasetyo, 2013). This method aims to test the Capital Asset Pricing Model in the formation of an efficient portfolio to choose the best stock investment alternative.

#### **1) Research variable**

The research variable is a trait or characteristic attached to the object to be studied. In this study, stock investment decision making can be seen through the Capital Asset Pricing Model (CAPM) method on the IDX30 and the Bisnis-27 Index on the Indonesia Stock Exchange for the 2018-2022 period.

#### **2) Research design**

Research design descriptive is used because it aims to describe investment decision making using the Capital Asset Pricing Model (CAPM) method on the IDX30 and the Bisnis-27 Index on the Indonesia Stock Exchange for the 2018-2022 period.

Research with quantitative methods is a scientific approach to managerial and economic decision making. This approach starts from data, processes data and manipulates raw data into useful information.

### Population And Sample

#### 1) Population

The population in this study are all companies on the IDX30 and Bisnis Index-27 which are listed on the Indonesia Stock Exchange

#### 2) Sample

Sampling was carried out by purposive sampling method, namely the selection of sample members based on certain criteria. The criteria used are:

1. Companies listed on IDX30 and Business Index-27.
2. Companies that are shifting or inconsistent are on the IDX30 and Business Index-27 during the 2018-2022 period.
3. Multiple companies listed on the IDX30 or Business Index-27 are automatically entered on the IDX30 and deleted on the Business Index-27.

**Table 1. Research Sample**

No.	Code	Company name
1	ADRO	Adaro Energy Tbk.
2	ANTM	Aneka Tambang Tbk.
3	ASII	Astra International Tbk.
4	BBCA	Bank Central Asia Tbk.
5	BBNI	Bank Negara Indonesia (Persero) Tbk.
6	BBRI	Bank Rakyat Indonesia (Persero) Tbk.
7	BMRI	Bank Mandiri (Persero) Tbk.
8	INDF	Indofood Sukses Makmur Tbk.
9	KLBF	Kalbe Farma Tbk.
10	PGAS	State Gas Company Tbk.
11	SMGR	Semen Indonesia (Persero) Tbk.
12	TLKM	Telkom Indonesia (Persero) Tbk.
13	UNTR	United Tractors Tbk.
14	UNVR	Unilever Indonesia Tbk.
15	CPIN	Charoen Pokphand Indonesia Tbk
16	INKP	Indah Kiat Pulp & Paper Tbk.
17	PTBA	Bukit Asam Tbk.
18	PWON	Pakuwon Jati Tbk.

Source: [www.idx.co.id](http://www.idx.co.id) processed by researchers

### Variable Operational Definitions

The research variable is an observable character from a unit of observation which is an identifier or attribute of a group of objects. The purpose of these variables is the occurrence of variations between one object and another object in a particular group. Based on the existing concept, namely the Capital Asset Pricing Model (CAPM) method in investment, the variables that need to be examined are:

1) Stock returns

The rate of return is one of the factors that motivates investors to interact and is also a reward for investors' courage in taking risks on their investments.

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

Information:

$R_i$  : Return on Shares  $i$  in period  $t$

$P_t$  : Share price  $i$  in period  $t$

$P_{t-1}$  : Share price in period  $t-1$

2) Market Rate of Return

The market rate of return is the rate of return based on the development of the stock price index. The market rate of return can be calculated through the Composite Stock Price Index (IHSG) return. In Microsoft Excel, the Average function is used.

$$R_{om} = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$$

Information :

$R_{om}$  : Market Rate of Return

$IHSG_t$  : Stock Price Index period  $t$

$IHSG_{t-1}$  : Stock Price Index period  $t-1$

3) Risk Free Rate of Return

The risk-free rate of return is a measure of the minimum rate of return at the time of beta risk ( $\beta_i$ ) is zero. The risk-free rate of return is represented by the interest rate for Bank Indonesia Certificates (SBI) set by Bank Indonesia. In Microsoft Excel, the Average function is used.

$$R_f = n_{i=1} R_f$$

4) Systematic Risk (Beta)

Risk is a form of uncertainty about a situation that will occur later with the decisions taken, based on current considerations. In the CAPM, risk is beta ( $\beta$ ). Beta shows the relationship between the rate of return of a stock and the market rate of return because it is the quotient between the stock covariance and the market covariance. In Microsoft Excel, the Slope function is used between R shares and Ri IHSG.

$$\beta = \frac{\sigma_m}{\sigma_m^2}$$

Information :

B : Systematic Risk

$\sigma_m$  : Covariance between stock returns and market returns

$\sigma_m^2$  : Market Covariance

**Data Analysis Technique**

The data analysis technique used in this study was carried out using the Microsoft Excel program. Analysis of the application of the CAPM method in determining investment is carried out by:

- a. Collect closing price data for IDX30 shares and the Bisnis-27 Index listed on the Indonesia Stock Exchange for the 2018-2022 period.
- b. Calculate the rate of return or profit for each stock. The rate of return can be calculated using the following formula.

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

Information:

$Ri$  : Return on Shares i in period t

$P_t$  : Share price i in period t

$P_{t-1}$  : Share price in period t-1

- c. The market rate of return can be calculated through the Composite Stock Price Index (IHSG) return with the formula:

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

Information :

Rom : Market Rate of Return

IHSGt : Stock Price Index period t

IHSGt-1 : Stock Price Index period t-1

d. Calculating Beta Stock can be used the formula:

$$\beta = \frac{\sigma_m}{\sigma_m^2}$$

Information :

B : Systematic Risk

$\sigma_m$  : Covariance between stock returns and market returns

$\sigma_m^2$  : Market Covariance

e. Calculating the risk-free rate of return ( $R_f$ ) through the monthly BI rate which can be accessed via the internet page.

f. Calculating the expected profit level according to the CAPM with the formula:

$$E(R_i) = R_f + \beta_i [E(R_m - R_f)]$$

Where:

$E(R_i)$  : Return expectation of the i-th asset

$E(R_m)$  : Return market portfolio expectations

$R_f$  : Risk free interest rate (SBSN)

$[E(R_m - R_f)]$  : Market risk premium

$\beta_i$  : Asset risk i

g. Graphical depiction of the Security Market Line

The security market line is a line that shows the trade-off between risk and expected return for individual securities” (Jogiyanto, 2009). The Security Market Line (SML) is a graphical depiction of the CAPM model. SML is a line connecting the expected rate of return  $[E(R_i)]$  of a security with systematic risk ( $\beta$ ) to show how the market should price individual securities in relation to the investor's security risk class. SML allows us to calculate the expected rate of return for any security in relation to the market as a whole.

h. Classification of Efficient and Inefficient Shares

Stock valuation based on individual returns and expected returns are classified as efficient stocks and inefficient stocks. Efficient stocks are stocks that have individual stock returns greater than the expected rate of return  $[R_i > E(R_i)]$ . Efficient stocks will be seen above the SML line. Meanwhile, the stock is not efficient  $[R_i < E(R_i)]$  and the stock is below the SML line.



**Result and Discussion**

In determining the stock return in this study using the closing price of each issuer as a research sample. The closing price of the shares is obtained from the official website [www.idx.co.id](http://www.idx.co.id) and [www.yahoofinance.com](http://www.yahoofinance.com) with the research period 2018-2022. A list of closing prices for each company can be seen in the attachment.

**Results of Individual Stock Return Rate Analysis (Ri)**

The results of calculating individual returns for each company can be seen in the appendix.

**Table 2. Calculation Results of Individual Stock Return Rates (RI) of Each Company for the 2018-2022 Period**

No.	Code	Company name	Ri
1	ADRO	Adaro Energy Tbk.	0.01455
2	ANTM	Aneka Tambang Tbk.	0.02618
3	ASII	Astra International Tbk.	-0.00273
4	BBCA	Bank Central Asia Tbk.	0.01230
5	BBNI	Bank Negara Indonesia (Persero) Tbk.	0.00647
6	BBRI	Bank Rakyat Indonesia (Persero) Tbk.	0.00811
7	BMRI	Bank Mandiri (Persero) Tbk.	0.00689
8	INDF	Indofood Sukses Makmur Tbk.	-0.00033
9	KLBF	Kalbe Farma Tbk.	0.00591
10	PGAS	State Gas Company Tbk.	0.00337
11	SMGR	Semen Indonesia (Persero) Tbk.	-0.00218
12	TLKM	Telkom Indonesia (Persero) Tbk.	0.00102
13	UNTR	United Tractors Tbk.	-0.00222
14	UNVR	Unilever Indonesia Tbk.	-0.01181
15	CPIN	Charoen Pokphand Indonesia Tbk	0.01224
16	INKP	Indah Kiat Pulp & Paper Tbk.	0.00959
17	PTBA	Bukit Asam Tbk.	0.00628
18	PWON	Pakuwon Jati Tbk.	-0.00175

Source: processed secondary data, 2023

Based on the table above, the individual rate of return (Ri) of the 18 company shares that are the research sample in the 2018-2022 period shows that the shares of the company Aneka Tambang Tbk (ANTM) have the highest average overall rate of individual returns during the study period, namely 0.02618, while stocks with the lowest overall average

individual returns during the study period areIndofood Sukses Makmur Tbk (INDF) of - 0.00033 Based on the table above, it can also be seen that there are 12 company shares with positive individual returns and 6 company shares with negative individual returns.

The companies that have a negative individual rate of return include Astra International Tbk (ASII), Indofood Sukses Makmur Tbk (INDF), Semen Indonesia (Persero) Tbk (SMGR), United Tractors Tbk (UNTR), Unilever Indonesia Tbk (UNVR), Pakuwon Jati Tbk (PWON). With a negative individual return value, this is also a consideration for investors to make further investment decisions, because a negative (Ri) value is considered less profitable for investors.

**Results of Market Rate of Return Analysis (Rm)**

The market rate of return is a rate of return that is based on the development of the stock index. The stock index used in this study is the Composite Stock Price Index (IHSG), because the JCI can represent all stock trading activities listed on the Indonesia Stock Exchange. Market returns are calculatedby subtracting the JCI in the current month from the previous month, then dividing it by the JCI in the previous month. Calculation of market returns can be seen in table 4.4.

**Table 3. Market Return Rate**

Year	Month	IHSG	Rm
2018	Jan	6605.63	
	Feb	6597.22	-0.00127
	Mar	6,188.99	-0.06188
	Apr	5994.60	-0.03141
	May	5983.59	-0.00184
	Jun	5,799.24	-0.03081
	Jul	5936.44	0.02366
	Aug	6018,46	0.01382
	Sept	5976.55	-0.00696
	Oct	5831.65	-0.02424
	Nov	6056.12	0.03849
	dec	6194.50	0.02285
2019	Jan	6532.97	0.05464
	Feb	6,443.35	-0.01372
	Mar	6,468.75	0.00394
	Apr	6455.35	-0.00207
	May	6209,12	-0.03814
	Jun	6358.63	0.02408
	Jul	6390.50	0.00501
	Aug	6328,47	-0.00971

	Sept	6169.10	-0.02518
	Oct	6,228.32	0.00960
	Nov	6011.83	-0.03476
	dec	6299.54	0.04786
2020	Jan	5940.05	-0.05707
	Feb	5,452.70	-0.08204
	Mar	4,538.93	-0.16758
	Apr	4,716.40	0.03910
	May	4,753.61	0.00789
	Jun	4905.39	0.03193
	Jul	5149.63	0.04979
	Aug	5,238.49	0.01726
	Sept	4,870.04	-0.07034
	Oct	5128,23	0.05302
	Nov	5612.42	0.09442
	dec	5979.07	0.06533
2021	Jan	5862.35	-0.01952
	Feb	6,241.80	0.06473
	Mar	5985.52	-0.04106
	Apr	5995.62	0.00169
	May	5947.46	-0.00803
	Jun	5985.49	0.00639
	Jul	6070.04	0.01413
	Aug	6150.30	0.01322
	Sept	6,286.94	0.02222
	Oct	6591.35	0.04842
	Nov	6533.93	-0.00871
	dec	6581.48	0.00728
2022	Jan	6631.15	0.00755
	Feb	6,888.17	0.03876
	Mar	7071.44	0.02661
	Apr	7,228.91	0.02227
	May	7148.97	-0.01106
	Jun	6911.58	-0.03321
	Jul	6951.12	0.00572
	Aug	7178.58	0.03272
	Sept	7040.79	-0.01919
	Oct	7098.89	0.00825
	Nov	7081.31	-0.00248
	dec	6850.61	-0.03258
Amount			0.08776
Rm			0.00149

Source: processed secondary data, 2023

Based on the table above, it can be seen that the average (Rm) is as big as 0.00149 or 0.14% obtained from calculations using *Microsoft Excel* that is the Average function. The highest Rm value was in December 2020 of 0.06533 or 6.53% which illustrates the trading condition of the IHSB stock that was very active that month. Meanwhile, the lowest market rate of return (Rm) occurred in February 2018 of -0.00127 or -0.12% which illustrates that the IHSB trade experienced sluggishness that month.

**Risk Free Rate of Return (Rf)**

The risk free rate of return is the rate of return on a risk free investment using Bank Indonesia Interest Rate (SBI) data.

Table 4. Risk Free Rate for the 2018-2022 period

Year/Month	2018	2019	2020	2021	2022
Jan	4.25%	6.00%	5.00%	3.75%	3.50%
Feb	4.25%	6.00%	4.75%	3.50%	3.50%
Mar	4.25%	6.00%	4.50%	3.50%	3.50%
Apr	4.25%	6.00%	4.50%	3.50%	3.50%
May	4.75%	6.00%	4.50%	3.50%	3.50%
Jun	5.25%	6.00%	4.25%	3.50%	3.50%
Jul	5.25%	5.75%	4.00%	3.50%	3.50%
Aug	5.50%	5.50%	4.00%	3.50%	3.75%
Sept	5.75%	5.25%	4.00%	3.50%	4.25%
Oct	5.75%	5.00%	4.00%	3.50%	4.75%
Nov	6.00%	5.00%	3.75%	3.50%	5.25%
dec	6.00%	5.00%	3.75%	3.50%	5.50%
Average	0.04500 (4.50%)				
Average/ month	0.00375 (0.37%)				
Maximum	0.06 (6.00%)				
Minimum	0.035 (3.50%)				

Source: [www.bps.co.id](http://www.bps.co.id) data processed, 2023

Based on the table above, the largest Bank Indonesia interest rate occurs in November 2018-June 2019, namely 6.00% or 0.060 and the smallest risk-free rate of return occurs in February 2021-July 2022, namely 3.50% or 0.035 . The average interest rate for the 2018-2022 period is 4.50% or 0.04500, this value is then divided by the number of months in a year (12), resulting in a monthly risk-free rate of return (Rf) value of 0.35% or 0.00375.

**Results of Systematic Risk Analysis for Each Individual Share ( $\beta$ )**

Beta ( $\beta$ ) is a systematic risk attached to a stock. Beta shows the relationship between the rate of return of a stock and the market rate of return because it is the quotient between the stock covariance and the market variance. The CAPM method also explains that investors must

consider the beta of a stock because it affects the price fluctuations of a stock and also the size of the expected rate of return.

**Table 5. Systematic Risk Each Individual Share ( $\beta$ )**

No.	Code	Company name	Beta ( $\beta$ )
1	ADRO	Adaro Energy Tbk.	1.19074
2	ANTM	Aneka Tambang Tbk.	2.69409
3	ASII	Astra International Tbk.	1.38331
4	BBCA	Bank Central Asia Tbk.	0.94408
5	BBNI	Bank Negara Indonesia (Persero) Tbk.	2.13877
6	BBRI	Bank Rakyat Indonesia (Persero) Tbk.	1.45845
7	BMRI	Bank Mandiri (Persero) Tbk.	1.40317
8	INDF	Indofood Sukses Makmur Tbk.	0.37613
9	KLBF	Kalbe Farma Tbk.	0.60742
10	PGAS	State Gas Company Tbk.	2.61047
11	SMGR	Semen Indonesia (Persero) Tbk.	1.52841
12	TLKM	Telkom Indonesia (Persero) Tbk.	0.86946
13	UNTR	United Tractors Tbk.	0.77989
14	UNVR	Unilever Indonesia Tbk.	0.24683
15	CPIN	Charoen Pokphand Indonesia Tbk	0.56808
16	INKP	Indah Kiat Pulp & Paper Tbk.	1.52455
17	PTBA	Bukit Asam Tbk.	0.84822
18	PWON	Pakuwon Jati Tbk.	1.83721

Source: processed secondary data, 2023

Based on the table above, it can be seen that the total value ( $\beta$ ) of the 18 sample companies is 23.00929 with an average beta value of 1.27829. The calculation results show that the average value of beta ( $\beta$ ) is worth more than 1 ( $> 1$ ), which indicates that the stock risk tends to be high. The calculation results also show that the highest beta ( $\beta$ ) value is owned by Aneka Tambang Tbk (ANTM) with a value of 2.69409 which indicates that the company's shares have high risk, are very active and are sensitive to changes in market prices. Meanwhile, the company stock that has the lowest beta value is Unilever Indonesia Tbk (UNVR) of 0.24683 or  $< 1$  which indicates that the stock has little risk, tends to be passive and less sensitive to changes in market prices (IHSG).

#### **Expected Rate of Return Analysis Results [E(Ri)]**

Expected rate of return [E(Ri)] is the amount of profit expected by investors from stock investments made. The CAPM method itself is used to calculate the expected rate of return

using the variable risk-free rate of return ( $R_f$ ), the average market rate of return  $E(R_m)$ , and also the systematic risk of each stock. The results of calculating the expected rate of return from 18 company shares can be seen in the following table:

**Table 6. Expected Rate of Return [E(R<sub>i</sub>)]**

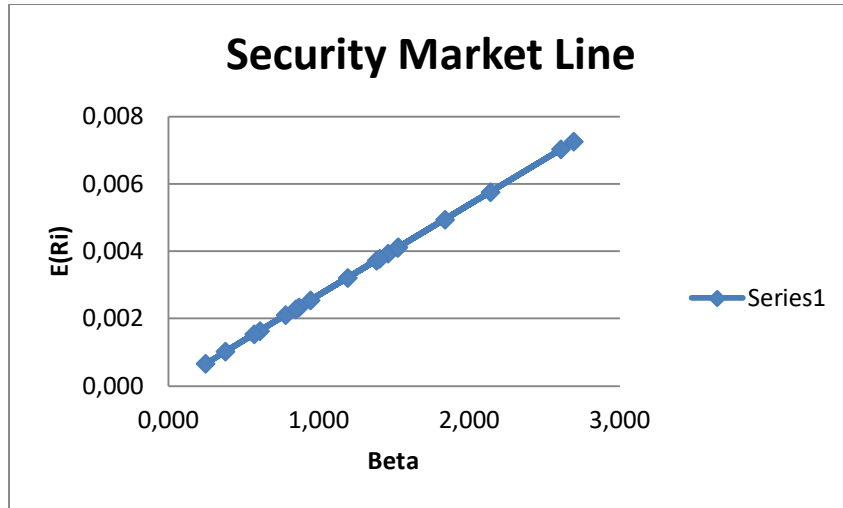
No.	Code	Company name	E(R <sub>i</sub> )
1	ADRO	Adaro Energy Tbk.	0.003203
2	ANTM	Aneka Tambang Tbk.	0.007247
3	ASII	Astra International Tbk.	0.003721
4	BBCA	Bank Central Asia Tbk.	0.002540
5	BBNI	Bank Negara Indonesia (Persero) Tbk.	0.005753
6	BBRI	Bank Rakyat Indonesia (Persero) Tbk.	0.003923
7	BMRI	Bank Mandiri (Persero) Tbk.	0.003775
8	INDF	Indofood Sukses Makmur Tbk.	0.001012
9	KLBF	Kalbe Farma Tbk.	0.001634
10	PGAS	State Gas Company Tbk.	0.007022
11	SMGR	Semen Indonesia (Persero) Tbk.	0.004111
12	TLKM	Telkom Indonesia (Persero) Tbk.	0.002339
13	UNTR	United Tractors Tbk.	0.002098
14	UNVR	Unilever Indonesia Tbk.	0.000664
15	CPIN	Charoen Pokphand Indonesia Tbk	0.001528
16	INKP	Indah Kiat Pulp & Paper Tbk.	0.004101
17	PTBA	Bukit Asam Tbk.	0.002282
18	PWON	Pakuwon Jati Tbk.	0.004942

Source: processed secondary data, 2023

Based on the table above, value *expected returns* the highest using the CAPM method is owned by Aneka Tambang Tbk (ANTM), which is equal to 0.007247, whereas the lowest expected return value using the CAPM method is owned by Unilever Indonesia Tbk (UNVR) as 0.000664. This shows that there is a positive linear relationship between the expected rate of return and systematic risk or beta, which means that the size of the expected rate of return depends on the size of the risk of a stock.

### Graphical Depiction of Security Market Line (SML)

The security market line is a line that shows the trade-off between risk and expected return for individual securities. Princess (2018). The security market line or Security Market Line (SML) is a graphical depiction of the CAPM model, because it describes the relationship between risk and the expected rate of return for individual securities as measured by beta. This is illustrated by the following SML chart:

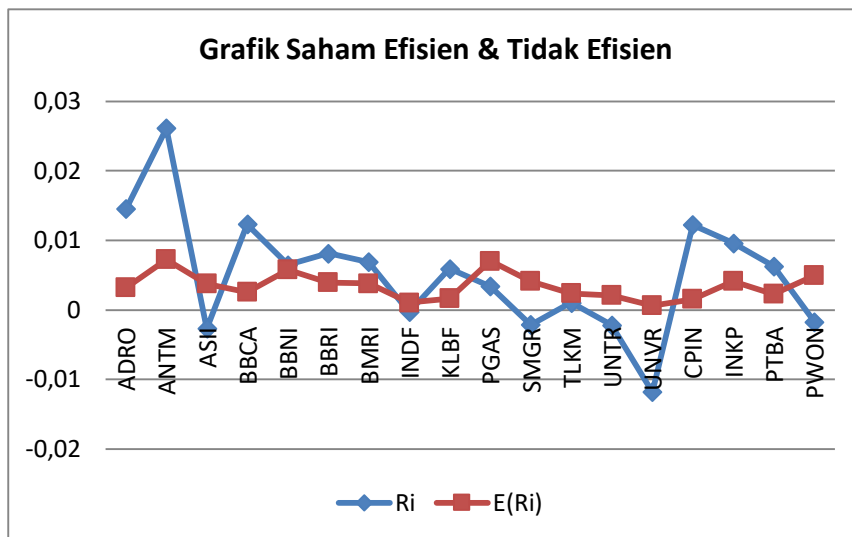


Source: processed data, 2023.

Based on the picture above, it can be seen that the greater the systematic risk ( $\beta$ ), the greater the expected rate of return  $E(R_i)$ . This shows that there is a positive and linear relationship between ( $\beta$ ) and  $E(R_i)$ . Figure 4.1 also shows that if the value ( $\beta$ ) = 1, then the expected rate of return is 0.0025.

### Grouping Efficient Stocks And Investment Decisions

Efficient stocks are stocks with individual returns greater than the expected rate of return or  $[R_i > E(R_i)]$ . Meanwhile, inefficient stocks are stocks with individual returns that are smaller than the expected rate of return  $[R_i < E(R_i)]$ . Efficient and inefficient stocks can be seen from the SML chart below:



Source: processed data, 2023

Based on the picture above, it can be seen that the position of the average individual rate of return (R<sub>i</sub>) for efficient stocks is above the point *expected returns* E(R<sub>i</sub>). On the other hand, the position of the average individual rate of return (R<sub>i</sub>) for stocks that are not efficient is below the expected return E(R<sub>i</sub>). Furthermore, to see a comparison between R<sub>i</sub> and E(R<sub>i</sub>) can be seen in the following table:

**Table 7. Classification of Efficient Shares**

No.	Code	Company name	R <sub>i</sub>	E(R <sub>i</sub> )	Group Share	Decision
1	ADRO	Adaro Energy Tbk.	0.01455	0.003203	Efficient	Buy
2	ANTM	Aneka Tambang Tbk.	0.02618	0.007247	Efficient	Buy
3	ASII	Astra International Tbk.	-0.00273	0.003721	Not efficient	Sell
4	BBCA	Bank Central Asia Tbk.	0.01230	0.002540	Efficient	Buy
5	BBNI	Bank Negara Indonesia (Persero) Tbk.	0.00647	0.005753	Efficient	Buy
6	BBRI	Bank Rakyat Indonesia (Persero) Tbk.	0.00811	0.003923	Efficient	Buy
7	BMRI	Bank Mandiri (Persero) Tbk.	0.00689	0.003775	Efficient	Buy
8	INDF	Indofood Sukses Makmur Tbk.	-0.00033	0.001012	Not efficient	Sell
9	KLBF	Kalbe Farma Tbk.	0.00591	0.001634	Efficient	Buy
10	PGAS	State Gas Company Tbk.	0.00337	0.007022	Not efficient	Sell
11	SMGR	Semen Indonesia (Persero) Tbk.	-0.00218	0.004111	Not efficient	Sell
12	TLKM	Telkom Indonesia (Persero) Tbk.	0.00102	0.002339	Not Efficient	Sell
13	UNTR	United Tractors Tbk.	-0.00222	0.002098	Not efficient	Sell
14	UNVR	Unilever Indonesia Tbk.	-0.01181	0.000664	Not efficient	Sell
15	CPIN	Charoen Pokphand Indonesia Tbk	0.01224	0.001528	Efficient	Buy
16	INKP	Indah Kiat Pulp & Paper Tbk.	0.00959	0.004101	Efficient	Buy
17	PTBA	Bukit Asam Tbk.	0.00628	0.002282	Efficient	Buy
18	PWON	Pakuwon Jati Tbk.	-0.00175	0.004942	Not efficient	Sell

Source: processed secondary data, 2023

Based on the table above, it can be seen that of the 18 company shares that were sampled, there were 10 shares in the efficient category and 8 shares in the inefficient category. Companies that are included in the category of efficient Adaro Energy Tbk, Aneka Tambang Tbk, Bank Central Asia Tbk, Bank Negara Indonesia (Persero) Tbk, Bank Rakyat Indonesia (Persero)



Tbk, Bank Mandiri (Persero) Tbk, Kalbe Farma Tbk, Charoen Pokphand Indonesia Tbk, Indah Kiat Pulp & Paper Tbk and Bukit Asam Tbk. For the efficient stock category, the investment decision is to buy the shares.

In this study, of the 18 company shares that were sampled, there were 10 shares in the efficient category and 8 shares in the inefficient category. Companies that are included in the category of efficient viz Adaro Energy Tbk, Aneka Tambang Tbk, Bank Central Asia Tbk, Bank Negara Indonesia (Persero) Tbk, Bank Rakyat Indonesia (Persero) Tbk, Bank Mandiri (Persero) Tbk, Kalbe Farma Tbk, Charoen Pokphand Indonesia Tbk, Indah Kiat Pulp & Paper Tbk and Bukit Asam Tbk.

While 8 company shares are in the inefficient category ie Astra International Tbk, Indofood Sukses Makmur Tbk, State Gas Company Tbk, Semen Indonesia (Persero) Tbk, Telkom Indonesia (Persero) Tbk, United Tractors Tbk, Unilever Indonesia Tbk, and Pakuwon Jati Tbk.

Because the samples taken in this study are a combination of two indices, namely the IDX30 and the Bisnis-27 Index, so according to research conducted on the two indices, IDX30 has shares that fall into the efficient category of 7 company shares, namely ADRO, ANTM, BBKA, BBNI, BBRI, BMRI, and KLBF. Meanwhile, from the Bisnis-27 Index, there are 8 company shares that are included in the efficient category, namely ADRO, BBKA, BBNI, BBRI, BMRI, CPIN, UNKP, and PTBA.

### **Conclusion and Suggestion**

Based on the results of the research and discussion in this study, the conclusions that can be drawn are Based on the picture above, it can be seen that the greater the systematic risk ( $\beta$ ), the greater the expected rate of return  $E(R_i)$ . This shows that there is a positive and linear relationship between ( $\beta$ ) and  $E(R_i)$ . Because the calculation results show that the average value of beta ( $\beta$ ) is worth more than 1 ( $> 1$ ), which indicates the condition of stock risk tends to be high (meaning that stock prices tend to rise or fall higher than the market price or  $R_m$ ).

And the criteria for determining investment decisions are choosing efficient stocks. Efficient stocks are stocks that have an individual rate of return that is greater than the expected rate of return or [ $R_i > E(R_i)$ ], while eliminating inefficient stocks are stocks that have an individual return value that is smaller than the expected rate of return or [ $R_i < E(R_i)$ ]. The investment decisions made on efficient stocks are considering buying these shares and the decisions made on inefficient stocks are considering selling these shares.

Suggestion for investors and prospective investors, before making an investment decision, investors and potential investors should first select which stocks are able to provide a profit or a more promising rate of return. The Capital Asset Pricing Model method is a method that can be used as a basis for consideration for investing in stocks. However, to get a fairly accurate estimate, you should use a fairly long period with the latest data. Not only looking for sources of information based on the CAPM method which describes the relationship of risk and return more simply because it only uses one variable ( $\beta$ ). The CAPM method also uses technical analysis, so if the results of this analysis are less convincing, we can use other analyzes that use fundamental techniques.

### Reference

- Birra, DAA (2018). Comparative Analysis of Optimal Portfolio Formation of 27 Business Index Stocks Using the Single Index Model (Sim) & Capital Asset Pricing Model (Capm) Method November 2012 - April 2017. In *Journal of Controlled Release* (Vol. 11, Issue 2).
- Fitriyani, DA (2020). Comparative Analysis of the Accuracy of the Capital Assets Pricing Model (Capm) and Arbitrage Pricing Theory (Apt) Methods in Predicting Stock Returns (Case Study of Stocks in Idx30 Period August 2015 – July 2018).
- Hasan, N., Pelleng, FAO, & Mangindaan, JV (2019). Capital Asset Pricing Model (CAPM) Analysis as a Basis for Stock Investment Decision Making (Study on the Bisnis-27 Index on the Indonesia Stock Exchange). *Journal of Business Administration*, 8(1), 36.
- Kennedy, PSJ, & Yanis, A. (2019). Determination of Stock Investment Decisions in the Plantation Sub Sector Based on the Capital Asset Pricing Model (Capm). *Darmajaya Business Journal*, 5(1), 38–52.
- Komara, EF, & Yulianti, E. (2021). Formation of an Optimal Portfolio Using the Capital Asset Pricing Model ( CAPM ) on the LQ-45 Index for the 2016-2018 period. *Journal of Management and Business*, 12(2), 173–183.
- Lento, GLD, Latif, IN, & Verahastut, Ic. (2019). Portfolio Analysis of Shares in Mining Sub-Sector Companies Listed on the Indonesia Stock Exchange (IDX) Using the Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) Approaches. *Journal of Indonesian Science Economic Research (JISER)*, 1(2), 12–19.
- Liadi, E., Dharmawan, K., & Nilakusmawati, DPE (2020). Determining Efficient Stocks Using the Capital Asset Pricing Model (Capm) Method. *E-Journal of Mathematics*, 9(1), 23.
- Nugraheni. (2018). Application of the Capital Asset Pricing Model (CAPM) to Investment

- Decisions (Study of Industrial Companies on the Indonesia Stock Exchange for the 2016-2018 Period). 1–14.
- Nugroho, M. (2018). Stock Portfolio Performance System in Making Investment Decisions Using the Constant Correlation Model in Business. 5, 49–61.
- Octovian, R. (2017). Optimal Portfolio Formation (Case Study of Lq45 Stock Index, Bisnis-27 and Idx30). 1(2), 74–88.
- Prasetyo, B. (2013). Quantitative Research Methods (Pert Edition). Rajawali Press.
- Putra, MDM, & Yadnya, IP (2016). Application of the Capital Asset Pricing Model Method as a Consideration in Making Stock Investment Decisions. Unud Management Journal, 5(12), 8079–8106 .
- Putri, FH (2018). Use of the Capital Asset Pricing Model (CAPM) Method in Determining Stock Investment Decisions (Study on the IDX30 Index on the Indonesia Stock Exchange in 2014-2015). Photosynthetica, 2(1), 1–13.
- Rudianto. (2012). Introduction of accounting. Erlangga Publisher.
- Salisa, NR (2021). Factors Influencing Interest in Investing in the Capital Market: The Theory of Planned Behavior (TPB) Approach. Indonesian Journal of Accounting, 9(2), 182. <https://doi.org/10.30659/jai.9.2.182-194>
- Shintia, D., & Hadistya, ID (2022). The Covid-19 Pandemic And The Movement Of The Business-27 Stock Index For The Period January - December 2021
- Turlinda, A., & Hasnawati. (2021). Capital Asset Pricing Model ( Capm ) And Accumulated / Distribution Line For Determining Groups Of Efficient Stocks.
- Van Horne, JC, & Wachowics, Jr, JM (2019). Principles of Financial Management (Fundamentals of Financial Management) (13th Edition). Salemba Four.
- Wardoyo, P. (2012). Capital Markets (Second Edition). Semarang University Press.
- Yulianti, R., & Azizah, DF (2014). Application of the Capital Asset Pricing Model (CAPM) Method to Determine Efficient Share Groups (Study of Go-Public Insurance Sector Companies Listed on the Indonesia Stock Exchange Period 2012-2014). 38(2), 122–130.