International Journal Of Management Finance

*Vol. 1, No. 2 December 2023, Hal. 11-19*

*DOI: https://doi.org/10.62017/finance.v1i2.11*

# Analysis Of The Effect Of Stock Returns Using The Capital Asset Pricing Model (Capm) Method On Risk In Food And Beverage Companies Listed On The Idx For The 2020-2022 Period

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***Abstract***

*This study aims to determine whether the stock return obtained from the CAPM calculation can significantly affect the risk of food and beverage companies listed on the Indonesia Stock Exchange for the period 2020–2022. The variables used in this study are risk as an independent variable or independent variable calculated using the Beta (β) formula, and stock returns as a dependent variable or dependent variable calculated using the CAPM formula. This study uses a descriptive statistical analysis test, a classical assumption test, and a partial t hypothesis test. The results of this study indicate that the stock return variable significantly affects the risk variable because the sig value is 0.004 < 0.05, which means Ho is rejected and Ha is accepted, which means that the effect of the independent variable on the dependent variable is unidirectional. This shows that the higher the level of return expected by investors, the higher the level of risk that investors will take. This is in accordance with the portfolio theory in the CAPM method, which suggests that there is a positive and linear relationship between beta, risk, and the expected rate of return.*

***Keywords***: *CAPM, Stock Return, Risk*

## INTRODUCTION

People are looking for investment opportunities in Indonesia as one of the places to get the money they need to fulfill their needs. Investment plans must be carefully considered by investors because investing is a long-term strategy that involves the use of capital resources to generate future profits. The decision to invest requires careful consideration of risks and returns. Investors usually anticipate high returns with little risk. However, if they are aiming for a much higher return, the risks involved will also be high. In addition, there is a high probability that investors will receive a lower return if they choose not to bear a large risk. Investors can use the CAPM approach to determine the level of return and risk before making an investment (Wardono, 2023).

The Capital Asset Pricing Model (CAPM) approach is a technique used as a way to determine the level of return and risk. The CAPM model, which was first proposed by scientists named Sharpe in 1964 and Lintner in 1965, is a way to determine the price of assets in equilibrium conditions. When a stock is in equilibrium, the amount of profit or return sought by investors will depend on the risk of the stock (Tandelilin E., 2010). CAPM makes the assumption that planners over a period of time have the same understanding of market conditions and optimal portfolios. In addition, CAPM makes the assumptions that there are no taxes or transaction costs, that all assets are publicly traded, that investors can lend and borrow without restriction at risk-free and fixed interest rates, and that the stock market is broad and investors are price takers. Capital markets are assumed to be efficient for the purpose of CAPM analysis. As a result, assets are always transferable and all securities are diversifiable, so investors can diversify to the smallest unit at any time.

According to the theory behind equity investment, the rate of return and the risk that investors anticipate will always be positively correlated; the higher the rate of return on a stock,

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the higher the risk of that stock. Because they are cautious of risk, investors will favor stocks with low projected returns. However, if they want to maximize returns, they should invest in riskier stocks (Hudri, 2013).

**PROBLEM FORMULATION**

Can stock returns using the CAPM method significantly affect risk?

**RESEARCH OBJECTIVES**

This study aims to determine whether stock returns using the CAPM method can significantly affect risk.

**RESEARCH BENEFITS**

1. For Investors
   This research is expected to provide information to investors regarding the risks and returns associated with the use of the CAPM approach before investing, so that investors can choose the appropriate shares.
2. For Issuers
   This research is expected to maximize the share price that may occur so that issuers can consider using the Capital Asset Pricing Model (CAPM) approach.
3. For researchers
   The author hopes that this research can add insight and knowledge, especially those related to the return and risk of shares of Food and Baverage companies listed on the Indonesia Stock Exchange (IDX) using the Capital Asset Pricing Model (CAPM) approach.
4. For further research
   It is estimated that in the future, researchers will be able to use the Capital Asset Pricing Model, or CAPM method, to assess how stock returns affect risk and choose the best investment.

**OVERVIEW**

**Investment and Portfolio Management**

Investment management, according to Hartono (2009), is the process of compiling a portfolio of stocks and bonds, as well as other financial instruments, in accordance with or appropriate to the objectives. In other words, management in investment is a type of financial service that involves buying, selling, and managing investments on behalf of clients. The process of putting together a portfolio of stocks, bonds, and other financial instruments that is fit for purpose is known as intra-investment management. The collection of investment assets held by people, businesses, financial organizations, and investment managers is called an investment portfolio (Tandelilin E., 2010).

**Capital Asset Pricing Modal *(CAPM)***

One of the equilibrium models that can ensure the relationship between return and risk that investors will receive is CAPM. According to Tandelilin E. (2010) in his book Portfolio and Investment, CAPM establishes a correlation between risk and expected return by an asset that fluctuates in the market with equilibrium prices. If the capital market is in a state of balance, the size of the risk concerned as well as the correlation between the risks of all assets can be ascertained through the creation of a general equilibrium model. This model is based on the equilibrium condition that systematic risk, which is measured using beta, will affect the amount of profit or return that investors want from a company because diversification can eliminate unsystematic risk (Husnan S., 2005).

**Stock Return (Ri)**

A number of cash distributions, such as dividends or interest payments expressed as a percentage of the initial value of an investment period, are usually included in the stock return

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expression, along with changes in asset value (capital gains or losses) (Hudri, 2013). The following formula can be used to determine the stock return of an asset (i) over a certain period of time (t) using historical data (stock prices in percentage terms) :

$$\text{Ri} = \frac{Pt - P(t-1)}{Pt-1}$$

**Expected Return (Ri)**

Expected Return (Ri)The higher the return that can be expected through investments that can be made in the future, the higher the expected return obtained by the company (Hudri, 2013). This expected return indicates that the expected return has not occurred, in contrast to the realization, which indicates that the return has occurred (Jogiyanto, 2017).

Expected Return Formula :

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

Ri = expected return
Rf = Risk-Free Rate of Return
β = Beta,
Rm = Expected Market Return

**Market Return (Rm)**

The average income or equity listed in the capital market is known as the market return. The anticipated future return is known as the market rate of return. The composite stock price index is the basis of the market rate of return (JCI). According to Fitria (2016), market return is defined, among others, as the market rate of return. Therefore, to maximize profits, one must ascertain market conditions by utilizing the Jakarta Composite Index (JCI) (Jamil, 2018).

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

$R_{M...}$ = Return Market…
$IHSG_{t...}$ = Current IHSG
$IHSG_{t-1}$ = Previous IHSG

**Risk-Free (Rf)**

The risk-free rate of return represents the fundamental truth that investing now will allow you to consume more later. It is a reward for the choice to defer consumption, not for the risk assumed. The risk-free rate, also known as the discount rate, is exclusively used by itself as a target rate of return for low-risk investments. According to Husnan S. (2005), the risk-free rate of return is the lowest rate of return and occurs when beta (βi) falls to zero. The interest rate on government securities, particularly the Bank Indonesia Certificate (SBI), is used as a fundamental proxy for this rate of return (Irfan, 2020).

**Systematic Risk/Beta (β)**

In accordance with Tandelilin E. (2010), beta represents the covariance between security returns and market returns, normalized by the variability of stock returns. (Hartono, 2009) defines beta as a metric for comparing the volatility of stock or portfolio returns with market returns. In other words, beta measures the extent to which an asset's return fluctuates or is susceptible to changes in market return (Irfan, 2020). A good way to measure systemic risk is to look at the stock beta of the relevant securities. According to Septian (2014), the beta value of a security signifies how responsive its rate of return is to market fluctuations. Biased betas are betas determined in emerging capital markets based on historical data.

Thin market transactions as a result of asynchronous trading are the cause of this biased beta (Septian, 2014). The assessment of investment-related beta, which characterizes the

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variance of returns similar to market returns, is very important (Bandawaty E., 2020). The formula of the single index technique for beta calculation is as follows (Bandawaty E., 2020) :

$$\beta_i = \frac{n \sum Ri\ Rm - \sum Ri \sum Rm}{n \sum Rm^2 - (\sum Rm)^2}$$

**CONCEPTUAL FRAMEWORK**

The relationship between one idea and another idea of the subject under study is known as the conceptual framework of research. The scientific ideas or theories that underlie a study are the source of the conceptual framework (Sujarwen, 2014).

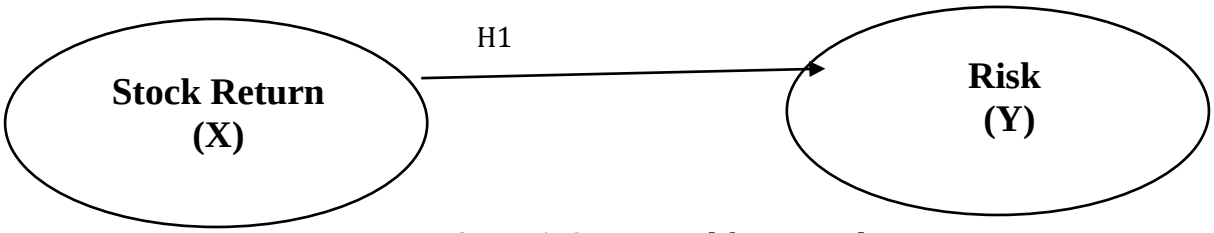


**Figure 1. Conceptual framework**

In this study, there are two variables. Stock return is the independent variable measured by Expected Return (Ri) CAPM, while risk is the dependent variable measured by Systematic Risk/Beta (β).

**Hypothesis Development**

"Stock returns affect risk." This is reinforced by knowledge of the CAPM, which states that there are several ways to calculate stock returns and risks and that the CAPM is an appropriate model. Among the equilibrium forms that serve to identify, in a balanced market, the correlation between the expected rate of return and the risk is CAPM (Safitri, 2017). In the investment world, there is an established relationship between return and risk. Specifically, a higher level of return is associated with high risk, and vice versa (Fakhri, 2021).

In addition, the CAPM model helps simplify and characterize the sometimes very complicated real-world relationship between return and risk (Fakhri, 2021). Stock returns should be measured using indicators consisting of Ri, Rm, and Rf to calculate the expected return E(Ri) of CAPM, and investor risk is determined by Beta. This allows one to ascertain whether stock returns have an impact on risk by using CAPM.

Based on the above description, the following hypothesis is proposed :

*H1= Stock returns have an effect on risk.*

**METHOD**

**Research Design**

The purpose of this design is to conduct quantitative descriptive research. Numbers of various types are used as data in quantitative research. (Sujarwen, 2014) defines quantitative research as any type of research that produces findings that can be evaluated or quantified (measured) using statistical methods. By using statistics, information, appearance, and findings, the quantitative descriptive research approach aims to create a picture or describe a scenario (Sujarwen, 2014). It starts with the collection and interpretation of data and ends with the presentation and results.

**Type of Data**

Quantitative data, specifically financial statement data in the form of numbers, rates, comparisons, and amounts, is used in this investigation. Time series data covering Food and Baverage companies listed on the Indonesia Stock Exchange (up to 50 companies) for 2020–2022.

**Data Source**

Secondary data, or data obtained indirectly from the source but from other sources, is the source of the data used in this study. These data sources include the Annual Reports of FnB Companies for the 2020–2022 Period Listed on the Indonesia Stock Exchange (IDX), Yahoo

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Finance, the official website of the Indonesia Stock Exchange, the internet, reference books, and scientific literature relevant to the research topic.

**Population and Sample**

a) Population
The population is the entire research subject. All 50 FnB companies, which are shares of FnB companies and have been listed on the IDX in 2020–2022, are the overall subject of this study.

b) Sample
The sample is representative of the benchmark as well as the overall set of research subjects and population. In this study, researchers can use some research subjects that can be taken from some of the overall research subjects if it is too large for them to be able to investigate all research subjects for any reason, for example, due to limited resources, time, or energy. Purposive sampling was used to determine the research sample. Based on certain standards and criteria, the purposive sampling method is a sampling technique.
These criteria are as follows :

1. Food and beverage companies listed in 2020–2022 on the Indonesia Stock Exchange (IDX)
2. Food and Beverage Sector companies listed on the Indonesia Stock Exchange that have an IPO (initial public offering) under the 2020 research period.
3. Market index data from January 2019 to December 2022, using monthly Composite Stock Price Index (JCI) data Information is sourced from Yahoo Finance and the Indonesia Stock Exchange website.
4. Risk-free asset data from the Bank Indonesia website, using monthly Bank Indonesia Certificate (SBI) data from January 2020 to December 2022.

Based on these standards and characteristics, five sample FnB companies were obtained for 2020–2022, namely :

**Table 1. LIST OF STOCKS THAT MEET THE SAMPLE CRITERIA**

| No | Company Name | Company Code | IPO Date |
|---|---|---|---|
| 1. | PT Indofood Sukses Makmur Tbk | INDF | 14 Juli 1994 |
| 2 | PT Campina Ice Cream Industry Tbk | CAMP | 9 Desember 2017 |
| 3 | PT Nippon Indosari Corpindo Tbk | ROTI | 28 Juni 2010 |
| 4 | PT Garudafood Putra Putri Jaya Tbk | GOOD | 10 Oktober 2018 |
| 5 | PT Mayora Indah Tbk | MYOR | 4 Juli 1990 |

**Data Processing Process**

Processing quantitative data entails collecting information that will subsequently be examined for statistical analysis. The procedures for handling quantitative data are listed below:

1. I collected some historical stock data from each of the five companies and then used the Yahoo Finance and Indonesia Stock Exchange websites to find all the important data, such as the IHSG.
2. Processed the data using Microsoft Excel to determine stock return (Ri), market return (Rm), risk-free return (Rf), expected return using the CAPM formula, and risk/beta.
3. Next, conduct statistical descriptive analysis tests, classical assumption tests, and t (one-test) hypothesis tests using SPPS.
4. Interpret the data and draw conclusions.

**RESEARCH RESULTS AND DISCUSSION**

**Descriptive Statistical Analysis**

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One type of research method that describes circumstances and events is descriptive statistical analysis. This approach describes phenomena, then proceeds to explain relationships, test theories, make predictions, and determine the significance and consequences of a problem that must be resolved. (Puspitasari, 2019).

**Table 2. Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| RIsk/Beta | -1.30492660 | 4.225748391 | 15 |
| Stock Returns | .66037020 | 1.320580003 | 15 |

The following explanation is based on the data presented above, which has been analyzed using IBM SPSS 22. From the table above, which shows that the mean on risk/beta is -1.304 and the standard deviation is 4.225, the mean on stock returns is 0.660 and the standard deviation is 1.320.

**Classical Assumption Test**

After a descriptive analysis is carried out, To complete this test, the following series of testing procedures must be followed :

1. Normality Test

The purpose of this test is to determine whether the residual variables have a normal or abnormal distribution. The Kolmogorov-Smirnov method with a significance level of 0.05 can be applied in this test. In addition, according to Ghozali (2018), data is considered normally distributed if the Kolmogorov-Smirnov sig value is greater than 0.05. Otherwise, it means that the data is not normally distributed. The following is a table for testing normality :

**Table 3. One-Sample Kolmogorov-Smirnov Test**

| | | Unstandardized Residual |
|---|---|---|
| N | | 15 |
| Normal Parameters[a,b] | Mean | .0000000 |
| | Std. Deviation | 3.04511579 |
| Most Extreme Differences | Absolute | .464 |
| | Positive | .380 |
| | Negative | -.464 |
| Test Statistic | | .464 |
| Asymp. Sig. (2-tailed) | | .302[c] |

Based on the normality test above, it can be seen that the CAPM significance value is 0.200 > 0.05 and stock returns are 0.302 > 0.05, which means that the residual values are both normally distributed.

2. Multicollinearity Test

According to Ghozali (2017), multicollinearity refers to the correlation between independent variables, which is represented by the correlation between the independent and dependent variables. In order to determine whether there is multicollinearity or not, it can be seen by using the VIF and tolerance values. If the results show that the tolerance value is > 0.100 and the VIF value is < 10.00, it means that there are no symptoms of multicollinearity.

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**Table 4. Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | .160 | .919 | | .174 | .864 | | |
| | Stock Returns | -2.219 | .640 | -.693 | -3.469 | .004 | 1.000 | 1.000 |

a. Dependent Variable: Risiko/Beta

Based on the multicollinearity test above, it can be seen that the tolerance value for stock returns is 1,000 > 0.100 and the VIF value is 1,000 < 10.00, which means that the tolerance value and VIF value indicate that there are no symptoms of multicollinearity.

3. Durbin Watson Autocorrelation

TestThe autocorrelation of the regression model (correlation between residuals) can be tested using the Durbin-Watson Autocorrelation Test. The main purpose of this test is to determine whether regression residuals close to time show a pattern of dependence. The following is a table for testing Durbin-Watson autocorrelation :

**Table 5. Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .693[a] | .481 | .441 | 3.160065996 | 2.161 |

a. Predictors: (Constant), Return saham
b. Dependent Variable: Risiko/Beta

Based on the autocorrelation test above, it can be seen that in the Durbin Watson table with n = 15 and k = 1, the du value sought from the Durbin Watson table is du of (1.361) < Durbin Watson (2.161) < 4-du (2.639), because the value of Durbin-Watson is located between du and 4-du, which indicates that as the basis for making autocorrelation test decisions, it can be concluded that there are no autocorrelation symptoms.

**Hypothesis Test**

Partial t-test

The following hypothesis testing criteria are applied to determine whether the independent variable can have an impact on the dependent variable :

1. If the significance value is <0.05, it can be seen that the independent variable has a substantial effect on the dependent variable, so Ho is rejected and Ha is accepted.
2. If the significance value is greater than 0.05, it can be known that the independent variable does not have a substantial influence on the dependent variable, so Ho is accepted and Ha is rejected.

**Table 6. Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | .160 | .919 | | .174 | .864 | | |
| | Return saham | -2.219 | .640 | -.693 | -3.469 | .004 | 1.000 | 1.000 |

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a. Dependent Variable: Risiko/Beta

Based on the partial t test, it proves that the stock return variable significantly affects the risk variable because the sig value is 0.004 < 0.05, which means Ho is rejected and Ha is accepted.

**DISCUSSION**

From the results of descriptive statistical analysis testing The mean result on risk/beta is -1.304 and the standard deviation is 4.225; the mean on stock returns is 0.660 and the standard deviation is 1.320. The significance value of CAPM is 0.200 > 0.05 and stock return is 0.302 > 0.05, which indicates that the residual values are both normally distributed, in accordance with the normality test results mentioned above. The tolerance value for stock returns is 1.000 > 0.100 and the VIF value is 1.000 < 10.00, which indicates that there are no multicollinearity symptoms, according to the multicollinearity test results. And based on the autocorrelation test, it can be seen that the Durbin Watson table with n = 15 and k = 1 has the du value sought, which is du of (1.361) < Durbin Watson (2.161) < 4-du (2.639), in accordance with the autocorrelation test. Since the Durbin Watson value is between du and 4-du, it can be used as the basis for determining the results of the autocorrelation test, and it can be concluded that in this test there are no symptoms of autocorrelation. Then the partial t-test shows that there is a significant relationship between the return variable and the risk variable, as evidenced by the sig value of 0.004 < 0.05, indicating that Ho is rejected and Ha is accepted.

**CONCLUSIONS**

Expected Return CAPM is used to measure the stock return variable as an independent variable. In addition, the dependent variable, measured using systematic risk or beta, is the risk variable. Then, based on the results of partial t hypothesis testing, it is proven that the return variable is significantly influenced by the risk variable because the sig value of 0.004 < 0.05 indicates that Ho is rejected and Ha is accepted, which indicates a unidirectional effect of the independent variable on the dependent variable. Then this can indicate that investors will get an expected level of return comparable to bearing greater risk (Wardono, 2023). This is consistent with the CAPM method portfolio theory of Tandelilin E. (2010), which postulates a positive and linear correlation between beta/risk and the expected rate of return. Similarly, it is common knowledge in the investment world that return and risk have a significant correlation, i.e., if the return is high, then the risk will also be high, and vice versa. If the return is low, then the risk will also be low.

**ADVICE**

1. Suggestions that the author can give are that investors are expected to buy appropriate shares, and investors should use the Capital Asset Pricing Model (CAPM) method first to determine the rate of return and stock risk.
2. The author suggests that investors can choose stocks with high returns with high risk, but if investors do not want high risk, the consequence is a low return.

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