Analysis of Efficient Portfolio Formation in Stock Selection Case Study of a Food and Beverage Company Listed on the Indonesian Stock Exchange

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Abstract
The mission of this study is to assess the effectiveness of the portfolio development process in selecting shares listed on the Indonesia Stock Exchange (BEI), the focus is on the food and beverage company sector.The object of this research is the moon January-December 2022. The sample used was 5 companies with 10 portfolio combinations. In an era of economic uncertainty and market fluctuations, it is important for investors to understand how to build efficient portfolios to achieve their financial goals. This case focuses on the food and beverage industry because this sector is often used as an attractive investment option by a number of investors.This research involves assessing historical data regarding the share value of companies in the food and beverage industry sector and listed on the IDX.This historical dataused to evaluate the performance of these stocks, identify elements that influence changes in stock prices, and design optimal portfolio models.This research also involves risk and return investment analysis in forming a balanced portfolio. In this research, two optimal portfolios were identified, both with equal fund allocations and different fund allocations.This research provides valuable insight into how investors canchoose shares that suit their investment goals.These findings can help investors to mitigate risks and increase the potential returns on their investments. This research has significant practical implications for investors, especially those interested in the food and beverage sector on the Indonesia Stock Exchange.With a deep understanding of efficient portfolio formation, Investors can make smarter investment decisions and more effectively manage their risks. In this way, the research makes a significant contributionin developing better investment strategies in the Indonesian stock market.

Keyword:
Efficient portfolio formation, portfolio analysis, stock selection, Indonesian stock exchange, food and beverage companies, risk and returninvestment, Indonesian stock market

1. INTRODUCTION

Investment is a decision to channel a certain amount of capital in the hope of obtaining additional financial benefits and a profitable rate of return (Fischer & Jordan, 2004). Almost every type of investment involves an element of uncertainty or risk. A financier must be able to assess the risk in his portfolio, which includes the extent to which actual results are likely to differ from initial expectations and how much potential profit can be achieved. When faced with risky investment opportunities, investment decisions are not only influenced by the expected rate of return, but also involve the extent of readiness to face significant risks (Husnan, 2005). Investors allocate their funds in the hope of getting maximum returns by minimizing risks as much as possible. In order to reduce the level of loss or risk, it is recommended for investors to channel their investments into various instruments. The combination of these instruments is known as a portfolio (Zubir, 2011). This portfolio diversification is a key factor in managing risk because by spreading out their investments, investors can reduce the negative effects of possible market fluctuations. This allows them to achieve more stable and balanced investment results. As stated by (Sharpe, 2005), there are several main aspects that need to be considered when creating a portfolio. First, selective stock selection should be a priority, with an emphasis on stocks that have the potential for good returns. Second, determining the investment period is important because market and economic conditions can change over time. Finally, the principle of diversification remains essential, because by combining diverse stocks, investors can reduce the

overall risk in their portfolio. By considering all these factors, investors can create an optimal portfolio that reflects their investment goals and profile. Portfolios can be identified using two methods, namely the Markowitz Model and the Single Index Model. The Markowitz Model approach focuses on the correlation between investment returns and risk, enabling more optimal diversification management compared to random methods. In view of the Markowitz Model, the profits from adding shares to a portfolio do not always increase linearly, and at a certain point, continuous additions can increase the level of risk rather than providing greater diversification benefits (Tandelilin, 2010).

The key to building an efficient portfolio lies in the investor's ability to assess the desired level of risk and profit potential, as well as in creating an optimal portfolio combination using the Markowitz model. Efficiency in selecting a portfolio depends on the investor's ability to interpret and understand market dynamics. In this situation, investors need to thoroughly understand various investment instruments, including shares, bonds, property and other financial resources. They must be able to evaluate the risks inherent in each of these instruments and understand how those risks may be affected by global events, economic policies, and other factors. Apart from that, investors also need to be able to assess the potential profits expected from each investment instrument. This involves analyzing the asset's potential growth, the level of dividends or interest that can be earned, as well as projected future market performance. With a solid understanding of expected returns and risks, investors can more precisely select instruments that suit their investment goals. The Markowitz model plays a key role in helping investors determine efficient portfolio combinations. By utilizing this model, investors can determine the extent to which financial instruments can support each other to create a portfolio with a specific level of risk and expected return on investment. This allows investors to achieve their financial goals optimally. In practice, efficient portfolio selection also requires continuous monitoring of market changes and portfolio adjustments as needed. This may include whitening the portfolio if the ratio between instruments changes over time or if investment objectives change. Therefore, selecting an efficient portfolio is a dynamic process and requires a commitment to continuous learning and adapting to changes in the investment environment. Investors who have a good understanding of risk and return, as well as a deep understanding of the Markowitz model, have a greater chance of achieving success in long-term investing. A portfolio is a combination of stock investments arranged to achieve investment objectives with the lowest possible risk. According to (Yunita, 2018), one of the main difficulties in conceptualizing a stock portfolio arises when having to determine which stocks to include as candidates in the portfolio. Portfolio theory suggests that investors have the ability to invest capital in various types of shares in various places with various compositions in order to avoid losses if portfolio diversification is not carried out, as mentioned by (Maf'ula, 2018).

2. RESEARCH METHODOLOGY

This research aims to help investors form efficient portfolios by applying the Markowitz method to a number of selected stocks. The approach applied in this research is qualitative and descriptive in nature to describe the process of determining an efficient portfolio model based on the data collected. The formation of an efficient portfolio was carried out using the Markowitz model and carried out on 5 shares of selected companies in the food and beverage sector listed on the IDX for the 2023 period. The data taken is historical data on share prices for food and beverage companies in the form of opening and closing prices. This data can be accessed from sources such as the official IDX website or securities company websites, such as www.investing.co.id and www.yahoofinance.co.id.

Data collection technique

The documentation method is a data collection method applied in this research. Next, data analysis was carried out using the Markowitz Method analysis to identify shares to form an efficient portfolio combination.

Data Processing Process

1) Dnature of portfolio formationThe initial stages carried out areObtain closing price data for each share, then next calculationreturn everysharewith the formula:

$$R_{ij} = \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$$

Information :

Rij : Returnshare
Pt : Individual stock prices at the end of the period
Pt-1 : Individual stock prices at the beginning of the period
In : Dividendof shares received in stock i

2) After calculating the return for each share, nextcalculate the expected return fromeverycompany stock.RThe formula for calculating expected return is as follows:

$$E_{(Ri)} = \sum_{i=t}^{n} \frac{R_{ij}}{n}$$

Information:
ERi : *Expected return*from investment in shares i
Rij : *Actual return*from investment in shares i
N : Number of observation periods

3) Calculating stock risk, followsrThe formula for calculating stock risk is:
Calculating Variance with the formula:

$$\sigma_i^2 = \sum_{j=1}^{n} \frac{\left(R_{ij} - E(Ri)\right)^2}{n}$$

Information:
σ^2i : Stock variants i
Rij : Returnshares i
Ri : Returnexpected from shares i
n : Amountobservation period

Calculating Standard Deviation using the formula:

$$\sigma = \sqrt{\frac{\left(R_{ij} - E(Ri)\right)^2}{n}}$$

Information:
σ : Standard deviation
Rit : Returnstock i in period t
E(Ri) : Returnwhich are expected
n : Amountobservation period

4) Portfolio Formation
In order to determine the number of portfolios that will be formed, you can use the factorial formula, namely:

$$C_{(r.n)} \frac{n!}{r!\,(n-r)!}$$

Information :
C(rn) : Combination of r levels of n objects
n! : Factorial number of stock objects
r! : Factorial of the number of shares combined

5) Calculating Portfolio Profit Rates

$$E(R_p) \sum_{t=1}^{n} [X_A . E_{(R_A)} + X_B . E_{(R_B)}]$$

Information :

XA	: Proportion of investment funds on A shares
XB	: Proportion of investment funds on B shares
ERA)	:Expected Returnfrom share A
E(RB)	: ExpectedReturnfrom B shares

6) Calculating Correlation Coefficient

$$\rho xy = \frac{n \sum xy - \sum x . \sum y}{\sqrt{[n \sum x^2 - (\sum x)^2] . [n \sum y^2 - (\sum y)^2]}}$$

Information :

ρxy	: Correlation coefficient between*returns*shares x and y
n	: Number of observations
x	: Returnshare i (x)
y	: Returnshare i (y)

7) Calculating Portfolio Risk

$$\sigma_\rho = \sqrt{X_A{}^2 . \sigma_A^2 + X_B{}^2 . \sigma_B^2 + 2(X_A . X_B . \rho_{AB} . \sigma_A . \sigma_B)}$$

Information :

σp	: Portfolio standard deviation
σp^2	: Portfolio variant
σA^2, σB^2	: Stock variants A, B
XA, XB	: The proportion of funds invested in shares A and B
ρAB	: Correlation coefficient of shares A and B

8) Determining an efficient Stock Portfolio

Obtain analysis of several stock portfoliosshowefficient stock portfolio and inefficient stock portfolio. An efficient stock portfolio is a portfolio that is located on the efficient frontier (EF).WhereWhen compared with other stock portfolios, this portfolio meets the following qualifications:

1. Giveprofit levellargest with the same risk, or
2. Provides the least risk withprofit levelthe same one.

Data analysis method

The data obtained will be processed and analyzed using the Markowitz technique. Through this technique, an efficient portfolio will be produced by minimizing risk and maximizing return. In research using the Markowitz method, investors can maximize the expected return from an investment with a certain level of risk or try to minimize risk at a certain level of profit target. In practice, investors usually diversify their investments by combining several securities, simply by creating an investment portfolio. The basis of the Markowitz portfolio model is to provide input to investors to avoid risks and provide optimal profits on every investment decision.

3. RESULT AND DISCUSSION

Investment

According to Jogiyanto (2003), investment can be explained as delaying the use of resources to achieve efficient production within a specified period. It emphasizes on delaying the use of resources to create more value in the future. Sukirno's view highlights that investments made in a sustainable manner by the community have a positive contribution to economic activity, employment opportunities, growth in national income and overall prosperity of society. This emphasizes the importance of investment as a driver of sustainable economic growth. Tandelilin (2001) defines investment as a commitment to funds or other resources now, with the intention of achieving profits in the future. Investment can be applied to real sectors, such as property, gold, equipment and buildings, or in the form of financial assets, for example deposits, shares or bonds. This shows that investment can be carried out in various forms, both in the form of physical assets and financial instruments. In terms of classification, investment in financial assets is divided into 2 main categories: (1) Direct investment:Involves the acquisition of financial assets that can be sold on the money market, capital market or derivatives market. For example, this includes savings and certificates of deposit obtained from financial institutions such as commercial banks (2) Indirect stock investments: individuals can purchase securities such as mutual funds, as part of their portfolio. This highlights taking a position in a financial instrument managed by another party as a representation of ownership in an investment portfolio.

Share

According to Darmadji and Fakhruddin (2012), shares are a symbol of ownership of a person or institutionat a company. Shares come in the form of sheets of paper that reflect the financial instrument. Shares act as proof of ownership of the assets of the company that issued them. Owning shares in a company gives investors the right to the company's income and assets after fulfilling the company's obligations (Tandelilin, 2001). Darmadji and Fakhruddin (2012) also highlight that shares can be grouped into several types. First, based on their claim rights, shares are divided into common shares and preferred shares. Shares canpositioning the owner in the lowest position in dividend distribution and claims upon company liquidation. Meanwhile, preferred shares combine elements of bonds and ordinary shares, obtain fixed income, for example bond interest, but do not guarantee profits according to investors' expectations. In terms of maintenance, shares are divided into bearer shares whose owners are not explicitly registered, facilitating the transfer of ownership betweeninvestors, and shares in the name of the registered shareholder are explicitly registered, making it easier to transfer ownership between investors, and shares in the name of the clearly registered shareholder and require special procedures for transferring ownership. Types of shares can also be classified based on their trading performance. Some categories include: (1) Featured Stock (Blue-Chip Stock): common stock of a company with a high reputation that is a leader in a similar industry, has stable earnings, and consistently pays dividends (2) Income Stock: shares of a company that is able to provide higher dividends than the average dividend of the previous year. (3) Growth Stock (Growth Stock - Well Know): shares of companies that experience high revenue growth and are recognized as leaders in a similar industry with a high reputation (3) Speculative Stock: shares from companies that do not necessarily consistently produce high income in the future (4) Cyclical Stocks (Counter Cyclical Stock): shares that are not influenced by macroeconomic conditions or general business situations and remain stable despite fluctuations in the economy or business situation.

Efficient Portfolio

Efficient portfolio formation involves considering the mix of investments that provideequivalent gain with minimal risk, or conversely, maximum gain with the same risk. When designing an optimal portfolio, it is important to select stocks based on returns and risk based on investor needs. In an effort to create an efficient portfolio, it is important to pay attention to the return coefficient of each asset that will be included. The correlation coefficient reflects the degree of relationship between the returns of the assets that make up the portfolio. If the correlation coefficient is h-1 (perfect negative correlation), it indicates that the returns of the two assets tend to move in opposite directions over a period of time. On the other hand, if the correlation coefficient is h+1 (perfect positive correlation), the returns from both assets tend to move in the same direction over a period of time, and portfolio diversification will not have a significant effect.

Portfolio risk

According to Jogiyanto (2010), risk in a portfolio refers to variations or fluctuations in the returns (returns) of the securities that make up the portfolio, which is different from the nature of the portfolio return itself. Portfolio risk, can also be interpreted as the weighted average of all the returns of the single securities that make up the portfolio, reflecting the weighted average value of all the risks of that single security. The risk in a portfolio can be lower than the weighted average value of the risk of each individual security. This is related to the concept of diversification, where by combining different types of securities in a portfolio, overall risk can be reduced. Although risks to individual securities still exist, diversification can help reduce a portfolio's overall risk exposure to significant individual fluctuations of a single security.

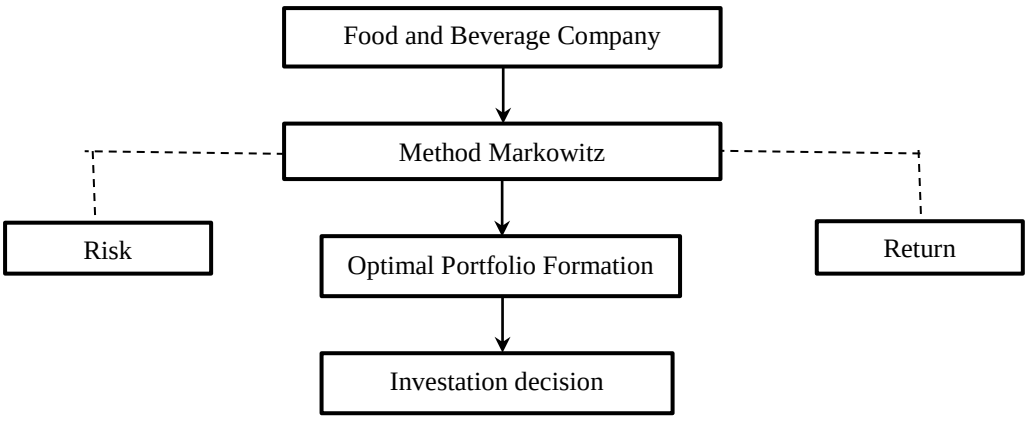
Determining an efficient portfolio

According to Jogiyanto (2000), an efficient portfolio includes a combination of assets that can provide the desired results with a predetermined level of risk, or provide minimal risk with predetermined results. Meanwhile, according to Tandelilin (2001), efficient portfolio formation takes into account how investors make investment decisions. One key assumption is that while most investors are reluctant to take other risks, investors who tend to be risk averse will choose investments with lower risk.

Markowitz Method

According to Markowitz (1952), there is a school that states that investors need to diversify and strive to optimize the desired profit potential. This rule states that investors should allocate their funds in various types of securities to achieve maximum profit potential according to their expectations. It is assumed that there is a portfolio that can provide maximum profit potential in accordance with investor expectations and minimum variance. Basic principles in the Markowitz approachis to use changes or variations in profits as an indicator of investment risk. Markowitz introduced the statistical concept of variance as a tool for measuring the level of risk. Portfolio theory becomes significant when investors have determined the level of risk they will accept. Markowitz's theory embraces the following principles: (1) In selecting an investment portfolio, the main considerations are expected returns and risks (2) Investors who think rationally will use an efficient portfolio, namely a portfolio that produces maximum profits for a specific level of risk or reduces risk to achieve the expected level of profit (3) Theoretically, an efficient portfolio can be created through analyzing each security according to expected profits, profit variance, and correlation coefficient between the profits of each security in the portfolio (4) The challenge in applying the Markowitz model is the difficulty of identifying efficient portfolios. According to this theory, if an investor wants to maximize the expected profits from a portfolio, investment allocation should be aimed at securities that have maximum profit potential. This means diversification needs to be done based on the highest projected returns, while also considering minimizing the variance (risk) in their portfolio.

Framework Of Thinking



The results of this research will produce an optimal efficient portfolio with the aim of minimizing risk while maximizing investment returns. This portfolio is a guide for investors in selecting the best shares to invest in. In forming an optimal portfolio using the Markowitz approach, a number of factors must be considered:

1. Risk: In the Markowitz model, consideration of the risk of each stock in the portfolio is done by measuring standardsdeviationor variance.
2. Return: The Markowitz model also calculates the return of each stock in the portfolio using the average stock return.
3. Correlation: Markowitz assumes that correlation between shares occurs due to the reaction of shares to changes in the general market index or price changes influenced by the market.
4. Proportion of funds: after determining the shares that form the optimal portfolio, the next step is to determine the proportion of funds invested in each share. This proportion must take into account the risk and return of each stock in the portfolio.

Indonesian Stock Exchange (BEI)

Currently, the responsibility of PT. The Indonesian Stock Exchange (PT.BEI) covers the management of securities trading activities in the Indonesian capital market. Initially, there were two stock exchanges, namely the Indonesian Stock Exchange and the Surabaya Stock Exchange. However, in 2007, the Surabaya Stock Exchangeunited with the Indonesian Stock Exchange. The Indonesian Stock Exchange building is the location of this company's head office, and the official website can be reached at www.idx.co.id.

Table 4.1 provided depicts share performance data for several companies over several months

MONTH	PT. MINERAL PUMP			PT. INDOFOOD SUCCESS MAKMUR		
	Starting Price	Final Price	Dividend	Starting Price	Final Price	Dividend
JAN	269.45	259.45	3.00	6325	6200	257
FEB	259.75	244.77	3.00	6325	6200	257
MAR	242.30	247.28	3.00	6225	5725	257
APR	248.12	249.16	3.00	5975	5950	257
MAY	250.86	252.21	3.00	6300	6000	257
JUN	253.19	246.88	3.00	6700	6575	257
JUL	246.35	263.37	3.00	7050	6725	257
AUG	262.54	252.28	3.00	6825	6200	257
SEP	251.82	230.74	3.00	6225	6025	257
OCT	233.52	272.66	3.00	6025	6450	257
NOV	273.69	272.79	3.00	6450	6450	257
DEC	273.16	263.24	3.00	6550	6725	257

MONTH	PT. SARIGUNA PRIMATIRTA CLEO.JK			PT. CAMPINA ICE CREAM CAMP.JK		
	Starting Price	Final Price	Dividend	Starting Price	Final Price	Dividend
JAN	468	424	1.65	290	278	20.00
FEB	424	444	1.65	278	270	20.00
MAR	444	434	1.65	260	264	20.00
APR	434	444	1.65	264	274	20.00
MAY	444	466	1.65	274	282	20.00
JUN	466	476	1.65	282	282	20.00
JUL	476	464	1.65	282	338	20.00
AUG	464	464	1.65	346	296	20.00
SEP	464	500	1.65	296	288	20.00
OCT	500	720	1.65	290	290	20.00
NOV	720	625	1.65	290	290	20.00
DEC	625	555	1.65	290	306	20.00

MONTH	PT. GARUDAFOOD PUTRA PUTRA JAYA GOOD.JK			IDX COMPOSITE	
	Starting Price	Final Price	Dividend	Starting Price	Final Price
JAN	525	500	6.00	6586.26	6631.15
FEB	500	505	6.00	6657.79	6888.17
MAR	505	575	6.00	6964.70	7071.44
APR	575	550	6.00	7093.70	7228.91
MAY	550	545	6.00	7154.92	7148.97
JUN	550	515	6.00	7130.60	6911.58
JUL	515	535	6.00	6911.58	6951.12
AUG	535	540	6.00	6951.12	7178.59
SEP	540	530	6.00	7178.59	7040.80
OCT	530	520	6.00	7040.80	7098.89
NOV	520	535	6.00	7098.93	7081.13
DEC	535	525	6.00	7081.19	6850.62

Table 4.1 provided depicts share performance data for several companies over several months, focusing on INDF.JK (PT. Indofood Sukses Makmur Tbk) and NICL.JK (PT. PAM Mineral Tbk) shares during December. In that month, INDF.JK shares reached their peak with an initial value of 6550 and a closing value of 6725. This indicates a quite significant increase during that period, reflecting good performance in the stock market. On the other hand, shares of PT. PAM Mineral Tbk, also in December, opened with a value of 273.16 and closed with a value of 263.24, showing a smaller change than PT. Indofood Sukses Makmur Tbk. Although the percentage difference is not as big as PT. Indofood Sukses Makmur Tbk, this still reflects positive growth in the value of the shares. With this data, it can be observed that INDF.JK shares experienced significant movements, while PT. PAM Mineral Tbk also increased, although on a small scale.

Calculating Expected Return (Expected Profit) From Each Share E(Ri)

In determining the Expected Return for each sample of food and beverage sector company shares, the following results are obtained:

Table 4.2 Determining the expected return (expected profit) from each share

RETURN (Ri)	NICL. JK	INDF.JK	CLEO. JK	CAMP.JK	GOOD. JK	JKSE (Rm)
JAN	-0.0260	0.0209	-0.0905	0.0276	-0.0362	0.03876
FEB	-0.0461	0.0209	0.0511	0.0432	0.0220	0.02661
MAR	0.0329	-0.0390	-0.0188	0.0923	0.1505	0.02227
APR	0.0163	0.0388	0.0268	0.1136	-0.0330	-0.01106
MAY	0.0173	-0.0068	0.0533	0.1022	0.0018	-0.03321
JUN	-0.0131	0.0197	0.0250	0.0709	-0.0527	0.00572
JUL	0.0813	-0.0096	-0.0217	0.2695	0.0505	0.03272
AUG	-0.0277	-0.0539	0.0036	-0.0867	0.0206	-0.01919
SEP	-0.0718	0.0092	0.0811	0.0405	-0.0074	0.00825
OCT	0.1805	0.1132	0.4433	0.0690	-0.0075	-0.00250
NOV	0.0077	0.0398	-0.1297	0.0690	0.0404	-0.03255
DEC	-0.0253	0.0660	-0.1094	0.1241	-0.0075	-1

Anticipated profit rate refers to the average value of profit that can be earned from shares during the period January to December. If shares show a positive level of expected profit, this indicates that there is an opportunity for shareholders to make a profit. Some examples of stocks with positive anticipated profit levels include PT. PAM Mineral Tbk (NICL), PT. Indofood Sukses Makmur Tbk (INDF), PT. Sariguna Primatirta Tbk (CLEO), PT. Campina Ice Cream Tbk (CAPM), and PT. Garudafood Putra Putri Jaya Tbk (GOOD). Therefore, for investors who are looking for growth opportunities in their portfolio, considering investing in these stocks can be an attractive option.

Calculating the Risk of Each Share

E(Ri)	**0.0105**	**0.0182**	**0.0262**	**0.0779**	**0.0118**	**-0.08035**
STDEV	0.0668	0.0449	0.1475	0.0817	0.0534	0.2906
Var	0.0346	-0.0481	0.1313	-0.0400	0.0210	
σi	0.0019	-0.0053	0.0084	-0.0095	0.0007	
σei2	0.0045	0.0018	0.0218	0.0067	0.0029	

In Table 4.3, it can be seen that the highest standard deviation value was recorded in PT shares. Sariguna Primatirta Tbk (CLEO), with a value of 0.1475. Meanwhile, shares of PT. Indofood Sukses Makmur Tbk (INDF) has the lowest standard deviation, namely around 0.0449. Standard deviation is an indicator that measures stock price fluctuations within a certain time period. This finding reflects the difference in the level of volatility or risk between the two stocks. Thus, this information can be used by investors and capital market analysis to support better investment decision making.

Enter Fund Investment Weight

In the next stage, after selecting shares for the combination portfolio, we will determine the investment proportion. This investment weight is divided into 50%:50% and 40%:60%, according to investor preferences. This preference focuses on achieving a level of profitmaximally with the smallest possible risk, while presenting comparable profit potential with a similar level of risk.

Portfolio Formation

Creating a portfolio is a profitable decision for investors because, compared to purchasing individual shares, this action can reduce the risks faced by investors through diversification. In this research, the portfolio formation process involves two combinations of shares from the same sector. The method used to form this stock portfolio uses a factorial formula. Below is an example of the calculations involved in the process.

$$= \frac{6!}{2!(6-2)!}$$

$$= \frac{5.4.3.2.1}{2.1(3.2.1)}$$

$$= \frac{120}{12}$$

$$= 10$$

Stock Portfolio Combination

Portfolio	Stock Portfolio Combination
1	PT PAM Mineral - PT Indofood Sukses Makmur
2	PT PAM Mineral - PT Sariguna Primatirta
3	PT PAM Mineral - PT Campina Ice Cream
4	PT PAM Mineral – PT Garudafood Putra Putri Jaya
5	PT Indofood Sukses Makmur - PT Sariguna Primatirta
6	PT Indofood Sukses Makmur - PT Campina Ice Cream
7	PT Indofood Sukses Makmur - PT Garudafood Putra Putri Jaya
8	PT Sariguna Primatirta - PT Campina Ice Cream
9	PT Sariguna Primatirta - PT Garudafood Putra Putri Jaya
10	PT Campina Ice Cream - PT Garudafood Putra Putri Jaya

Calculating the Profit Rate of a Stock Portfolio

Table 4.4 Profit Level of Stock Portfolio with 50% Weight: 50%

Profit Rate of Stock Portfolio with the Same Proportion (50%:50%)					
Portfolio	**Xa**	**Xb**	**Era)**	**E(Rb)**	**E(Rp)**
1	50%	50%	0.0105	0.0182	0.0144
2	50%	50%	0.0105	0.0262	0.0183
3	50%	50%	0.0105	0.0779	0.0442
4	50%	50%	0.0105	0.0118	0.0111
5	50%	50%	0.0182	0.0262	0.0222
6	50%	50%	0.0182	0.0779	0.0481
7	50%	50%	0.0182	0.0118	0.0150
8	50%	50%	0.0262	0.0779	0.0521
9	50%	50%	0.0262	0.0118	0.0190
10	50%	50%	0.0779	0.0118	0.0449
Highest					**0.0521**
Lowest					**0.0111**

In stock portfolio analysis, Table 4.4 provides an interesting picture. It can be seen that the allocation of funds is 50%: 50% into shares from portfolio 8, which consists of PT. Sariguna Prima Tirta Tbk and PT. Campina Ice Cream Tbk, provides a profit level of 0.0521 which is the highest among the portfolios presented. On the other hand, portfolio 4 which consists of PT. PAM Mineral Tbk and PT. Garudafood Putra Putri Jaya Tbk shows the lowest profit level of 0.0111. This analysis provides a clear view of the relative performance of various stock portfolios which can guide investment decision making.

Table 4.5 Calculation of Stock Portfolio Profits with a weight of 40%: 60%

Profit Rate of Stock Portfolio with the Same Proportion (40%:60%)					
Portfolio	**Xa**	**Xb**	**Era)**	**E(Rb)**	**E(Rp)**
1	40%	60%	0.0105	0.0182	0.0151
2	40%	60%	0.0105	0.0262	0.0199
3	40%	60%	0.0105	0.0779	0.0510
4	40%	60%	0.0105	0.0118	0.0113
5	40%	60%	0.0182	0.0262	0.0230
6	40%	60%	0.0182	0.0779	0.0541
7	40%	60%	0.0182	0.0118	0.0144
8	40%	60%	0.0262	0.0779	0.0572
9	40%	60%	0.0262	0.0118	0.0175
10	40%	60%	0.0779	0.0118	0.0382
Highest					**0.0572**
Lowest					**0.0113**

From Table 4.5, it can be seen that the distribution of fund allocation is 40% for the highest stock portfolio and 60% for the lowest. Portfolio 8, which consists of PT. Sariguna Prima Tirta Tbk and PT. Campina Ice Cream Tbk, achieved the highest profit level of 0.0572. In contrast, portfolio 4 which includes PT. PAM Mineral Tbk and PT. Garudafood Putra Putri Jaya Tbk, has the lowest profit level of 0.0113.

4. CONCLUSION

Based on the analysis above, there are several conclusions that can be given:

1. Stock Performance:
   a) PT shares. Indofood Sukses Makmur Tbk (INDF) showed a significant increase during December, indicating good performance. This may make it an attractive option for investors looking for short-term growth potential.
   b) PT shares. PAM Mineral Tbk (NICL) also increased during December, although on a small scale. This shows positive growth, although not as big as INDF.
2. Expected Profit Level:
   a) Investment in shares with a positive desired profit level, such as INDF, NICL, PT. Sariguna Prima Tirta Tbk (CLEO), PT. Campina Ice Cream Tbk (CAPM), and PT. Garudafood Putra Putri Jaya Tbk (GOOD), has the potential to provide profits to shareholders.
3. Stock Risk and Volatility:
   Standard deviation is used to measure stock price fluctuations. PT shares. Sariguna Prima Tirta Tbk (CLEO) has the highest standard deviation, indicating a higher level of volatility. Meanwhile INDF has the lowest standard deviation, indicating lower risk.
4. Portfolio Analysis:
   Portfolio 8, consisting of CLEO and CAPM, provides the highest rate of return with a 50%:50% fund allocation. This shows good diversification between two stocks with positive performance. Portfolio 4, including NICL and GOOD, shows the lowest rate of return. This indicates that this portfolio may be less attractive in terms of profit potential.

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