ADPEBI
International Journal of Business and Social Science

https://journal.adpebi.com/index.php/IJBS

Vol.2, No.2, 2022
e-ISSN: 2808-0939
pp. 74-84

Optimization of Stock Portfolio of Value30 Index and Growth30 Index Using The Markowitz Model and Sharpe Model

Adrian H Kalebos, Dudi Rudianto
Faculty of Economic and Social Sciences, Universitas Bakrie, Indonesia
adkalebos@gmail.com, dudi.rudianto@bakrie.ac.id

ARTICLE INFO
Research Paper

Article history:
Received: August 12, 2022
Revised: October 15, 2022
Accepted: October 30, 2022

doi.org/10.54099/aijbs.v2i2.276

ABSTRACT

This study aims to determine the results of optimizing stock portfolios on the Value30 and Growth30 indexes on the Indonesia Stock Exchange based on the Markowitz Model and Sharpe Model. There are seven stocks that are consistently listed on the Value30 index selected with the code ADRO, BJBR, ELSA, ITMG, PTBA, PTPP, UNTR and seven stocks that are consistently listed on the Growth30 index selected with the code ACES, BBCA, BBRI, CPIN, ERAA, TBIG , TOWR. The data is taken from the period January 2015 to December 2021. Using the Markowitz model on the Value30 index stock, from the comparison of the yields a return and standard deviation, the Coefficient of Variation/CV value is 7.426, and for the Growth30 index stock, the CV value is 3.279. Meanwhile, by using the Sharpe model on the Value30 index stock, a CV value of 4.937 was obtained, while the Growth30 index stock obtained a CV value of 3.169 This study concludes that the use of the Sharpe Model provides more optimal results than the Markowitz Model in portfolio formation both on the Value30 index stock and the Growth30 index with the proportion of funds being dominated by ADRO stocks for the Value30 index and BBCA stocks for the Growth30 index.

Keywords: Index_Growth30, Index_Value30, Model_Markowitz, Model_Sharpe, Portfolio

INTRODUCTION

Basically a portfolio is a combination of a set of assets, both in the form of real assets in the form of productive assets, as well as financial assets, whether carried out in the money market, capital market or other financial markets. Portfolio optimization plays an important role in determining investment strategies, and there are two important factors to consider, namely the expected return and the risk contained in these investment alternatives (Mayfi & Rudianto, 2014). Investors must have sufficient knowledge in order to determine which company shares will be selected in their portfolio and how much funds will be allocated to each stock they choose. (Pramono, . E. S. ., et. all., 2022).

Growth stocks usually have a relatively high price-to-earnings and price-to-book value ratio. Growth companies are considered to have good opportunities for considerable expansion over the next few years, both because they have a product or product line that they expect to sell well and because they perform better than many of their competitors and are predicted to gain an edge in the stock market (Rudianto, D., 2012). Investors will actively look for stocks that they consider cheap in the market. They argue that a security with a

low book-to-market ratio or a low price-to-earnings ratio will outperform other securities. (Cussen, Mark P., 2021). Value investing strategies have a long history in financial markets advocating a form of value investing that involves buying assets that are profitable, but undervalued. Although Value investing has become an important part of the equity investing landscape and has become the better part of the last century, confusion persists in the investment community about Value investing (Pettengill, G., Chang, G., & Hueng, C. J., 2014) . Historically, value investing has outperformed growth stocks; however, since 2007, value investing has performed relatively poorly, which has created an investment 'Value trap' (Asness, C., Frazzini, A., Israel, R., & Moskowitz, T., 2015).

According to the official Indonesian stock exchange website https://idx.co.id, the Value30 Index is an index that measures the price performance of 30 stocks that have low price valuations with transaction liquidity and good financial performance. While the Growth30 index is an index that measures the price performance of 30 stocks that have a trend of growth in net income and income relative to prices with transaction liquidity and good financial performance. These two indices represent two different investment styles. Value Investors target stocks with low multiples; for example, a high income-to-price ratio and a high book value-to-price ratio. And growth investors target high multiples (Solanki, Ashvinkumar H., 2014).

Table 1: Comparison Profiles of Value30 Index and Growth30 Index Listed on the Indonesia Stock Exchange

Index Name	IDX Value 30	IDX Growth 30
Index Code	IDXV30	IDXG30
Methodology	Capped Free Float Adjusted Market Capitalization Weighting On each periodic review, the constituent weight is capped so the highest weight in the index is no more than 15%.	Capped Free Float Adjusted Market Capitalization Weighting On each periodic review, the constituent weight is capped so the highest weight in the index is no more than 15%.
Eligibility	Booked net profit and positive equity Stocks with extreme price-to-earning ratio (PER) and price-to-book value ratio (PBV) are not considered	Booked net profit Stocks with extreme price-to-earning ratio (PER) are not considered
Selection	30 stocks with the lowest PBV and PER	30 stocks with the highest score of price-toearning ratio (PER) trend and price-to-sales (PSR) trend

The Markowitz model, until now, is one approach that is still widely used in selecting portfolio performance (Brigham, Eugene F., & Joel F. Houston, 2010), as well as the Sharpe Model as a model used to measure stock portfolio performance, by measuring the risk premium for each portfolio risk and dividing the portfolio risk premium by the standard deviation. The higher the Sharpe index of a portfolio, the better the performance of that portfolio.

The purpose of this study is to determine the performance comparison between the Markowitz model and the Sharpe model, which is considered the most optimal model in measuring the performance of the Value30 and Growth30 index portfolios listed on the Indonesia Stock Exchange.

LITERATURE REVIEW

Return is the difference between the amount received and the amount invested divided by the amount invested (Tandelilin, E, 2017). Return is one of the factors that motivate investors in investing and also a reward for the courage of investors to take risks on their investments (Fahmi, Irham, 2012). There are two sources of stock investment returns, namely capital gains (losses) and yields. The amount of capital gain is carried out by analyzing historical returns that occurred in the previous period, so that the level of expected return can be determined (Mayfi & Rudianto, 2014). Yield is a component of return that reflects the cash flow or income obtained periodically from an investment. In stocks, yield is indicated by the amount of dividends earned.

Risk is defined as a form of uncertainty about a situation that will occur in the future with decisions made based on various considerations at this time (Widoatmodjo, S., 2015). Widoatmodjo, S. (2015) stated that risk is a deviation from the expected income (ER/expected return).

Investors are risk averse and demand higher returns for riskier investments. Therefore, efforts are made to control portfolio risk without being influenced by declining rates of return. (Gabler, Andreas, 2019). To reduce portfolio variance (risk), the correlation between the assets that make up the portfolio must be inversely proportional (negative). If this is not possible, it is better to choose an asset with a correlation close to 0. If the investor has many stocks in the portfolio, then portfolio risk is not driven by the individual variances of each stock, but by how the stock correlates with other stocks in the portfolio. In other words, investors can only reduce and eliminate asset-specific risk (unsystematic risk) and end up with a portfolio with a variance approximately equal to the average covariance of the constituents, if the number of assets in the portfolio is large enough. Market or systematic risk cannot be diversified. (Chumilla, 2018).

Markowitz Models

The main conclusion from modern portfolio theory (MPT) is that investors should not only hold portfolios but should also focus on how the individual securities in the portfolio are related to one another. The key to good diversification is not limited to the number of assets that make up the portfolio, but also depends on the correlation between asset returns (Sirucek & Kren, 2015). Basically investors avoid risk. Rational investors will choose to hold an efficient portfolio by maximizing the expected profit at a certain level of risk or minimizing risk at a certain level of return (Hartono, J., 2017). Jogiyanto (2017) suggests that the formation of an optimal portfolio is carried out using the Markowitz model approach, namely by analyzing the relationship between risk and expected return. Risk is measured by the standard deviation or variance, while the expected return is determined by the average return. Therefore, the approach using the Markowitz model is also called the mean-variance optimization (MVO) method. The steps of the MVO method are as shown below.

1. Calculating Average Expected Return

$$R_P = \sum_{i=1}^{N} w_i R_i, \quad \sum_{i=1}^{N} w_i = 1$$

For a portfolio return of two assets, it can be written as follows, where Rp is the return on the portfolio, w_1 and w_2 are the weights of the two assets, and R_1, R_2 is the return on the two assets:

$$R_p = w_1 R_1 + (1 - w_1) R_2$$

with the note that w_1 and $w_2 \geq 0$ and the total = 1

2. Calculating Variance and Standard Deviation

$$\sum_{i=1}^{N} w_i = 1$$

$$\sigma_P^2 = \mathrm{Var}(R_P) = \mathrm{Var}\left(\sum_{i=1}^{N} w_i R_i\right)$$

The variance can be expressed more generally for N securities in a portfolio using the notation of the portfolio return calculation above. Since the covariance of an asset is itself the variance of an asset, we can separate the variance from the covariance in the second equation:

$$\sigma_P^2 = \sum_{i,j=1}^{N} w_i w_j \mathrm{Cov}(R_i, R_j)$$

$$\sigma_P^2 = \sum_{i=1}^{N} w_i^2 \mathrm{Var}(R_i) + \sum_{i,j=1, i\neq j}^{N} w_i w_j \mathrm{Cov}(R_i, R_j)$$

Correlation is a measure of the consistency or tendency of two investments to act in the same way. The correlation coefficient $\rho_{1,2}$ can be positive or negative and ranges from -1 to +1. $\rho_{1,2} = +1$: The returns on both assets are perfectly positively correlated. Assets 1 and 2 move together 100 percent of the time. $\rho_{1,2} = -1$: The returns of both assets are perfectly negatively correlated. Assets 1 and 2 are moving in opposite directions 100 percent of the time. $\rho_{1,2} = 0$: The returns of the two assets are uncorrelated. The movement of Asset 1 does not provide a prediction regarding the movement of Asset 2.

3. Finding an Efficient Frontier Portfolio

The most optimal portfolio returns can be calculated by finding the portfolio with the least risk for a certain return or maximizing the return for a certain risk.

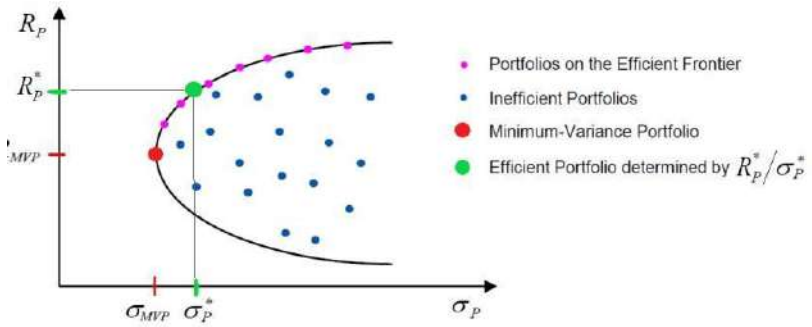

Figure 1.: Efficient Portfolio

All portfolios that lie above the efficient limit are unattainable and those that lie below are inefficient.

Sharpe Models

Sharpe's method is a method that uses the concept of the Capital Market Line (CML). The Capital Market Line (CML) provides an optimized relationship for the expected return and efficient portfolio risk, and does not distinguish between the unique and systematic risks of individual securities (Mokta, 2013). The Sharpe method is estimated by comparing the portfolio risk premium (difference between the average return on the portfolio and risk-free assets) with the portfolio risk or standard deviation (σ).

Sp = Sharpe kinerja performance index

$$S_p = \frac{R_p - R_f}{\sigma_p}$$

Rp = portfolio return or market rate of return.

Rf = return on risk-free assets.
p = total risk, which is the result of the sum of systematic risk and unsystematic risk.

The higher the Sharpe Ratio value, the better the performance of a portfolio. Sharpe's model is still popularly implemented in various literatures until now because of its ability to compare investments with different risk exposures (Wang, J., 2011). The hypothesis in this study is that the Sharpe model is considered a more optimal model than the Markowitz model in determining portfolio investment returns, both on the Value30 index stock and the Growth30 index.

METHOD

This study uses monthly stock price data from the Value30 index as a benchmark for value stocks, and the Growth30 index as a benchmark for growth stocks in Indonesia. In this study, to determine risk-free assets, the researcher uses the IndONIA interest rate. IndONIA is an index of interest rates on rupiah lending and lending transactions without collateral carried out between banks for overnight periods in Indonesia.

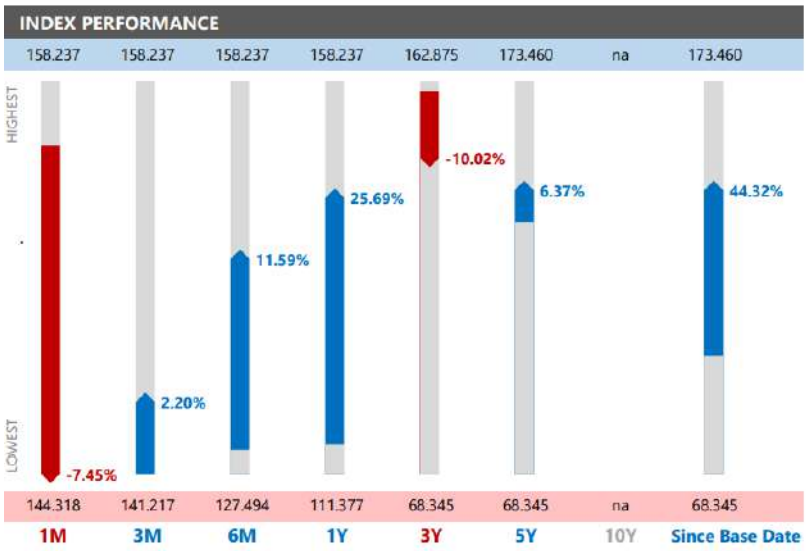

Figure 2: Historical Performance Index Value30

Within 1 year since January 30, 2014 which is the base day for calculating the index, the performance index is 25.69%. But after 3 years the index decreased by -10.02%. When calculated for 5 years, the performance index becomes positive 6.37%. And until June 30, 2022 (approximately 9 years) to 44.32%.

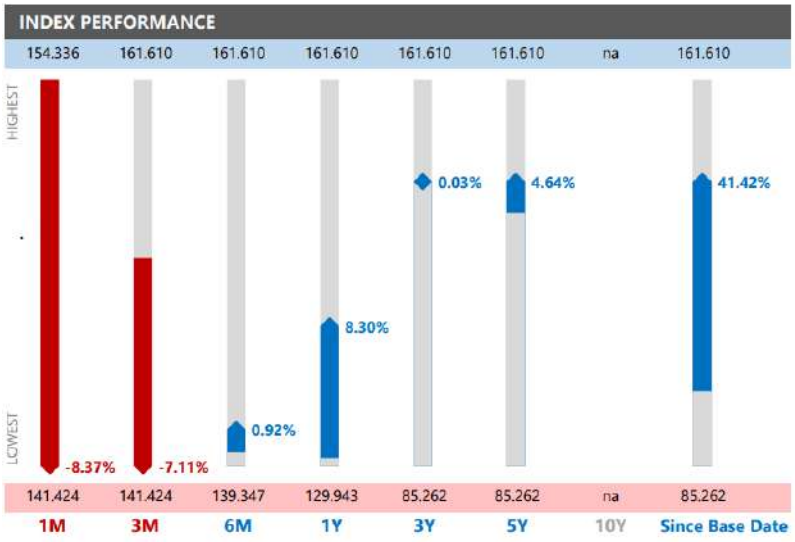

Figure 3: Historical Performance Index Growth30

Within 1 year since January 30, 2014 which is the base day for calculating the index, the index performance is 8.30%. But after 3 years the index dropped to 0.03%. When calculated for 5 years, the performance index is around 4.64%. And until June 30, 2022 (approximately 9 years) the performance index will be 41.42%. In this study, the stocks selected as samples are stocks that are consistently included in the index, namely when they were first formed, namely in August 2019 to December 2021. The closing price is obtained from the Yahoo finance site. Based on the above criteria included in the sample of this study there are as many as 14 stocks. The list of companies that are included in the Value30 index and the Growth30 index is in the table below.

Table 2: Companies Including Value30 and Growth30 Indexes Listed on the Indonesia Stock Exchange

No	Code	Stock Name	Sector	Index
1	ADRO	Adaro Energy Tbk.	IDXENERGY	Value30
2	BJBR	Bank Pembangunan Daerah Jawa Barat dan Banten Tbk.	IDXFINANCE	Value30
3	ELSA	Elnusa Tbk.	IDXENERGY	Value30
4	ITMG	Indo Tambangraya Megah Tbk.	IDXENERGY	Value30
5	PTBA	Bukit Asam Tbk.	IDXENERGY	Value30
6	PTPP	PP (Persero) Tbk.	IDXINFRA	Value30
7	UNTR	United Tractors Tbk.	IDXINDUST	Value30
8	ACES	Ace Hardware Indonesia Tbk.	IDXCYCLIC	Growth30
9	BBCA	Bank Central Asia Tbk.	IDXFINANCE	Growth30
10	BBRI	Bank Rakyat Indonesia (Persero) Tbk.	IDXFINANCE	Growth30
11	CPIN	Charoen Pokphand Indonesia Tbk	IDXNONCYC	Growth30
12	ERAA	Erajaya Swasembada Tbk.	IDXCYCLIC	Growth30
13	TBIG	Tower Bersama Infrastructure Tbk.	IDXINFRA	Growth30
14	TOWR	Sarana Menara Nusantara Tbk.	IDXINFRA	Growth30

Data Source : Indonesia Stock Exchange, 2020

RESULT AND DISCUSSION

From the research activities obtained data on the average return and risk of companies including the Value30 index and the Griowt30 index listed on the Indonesia Stock Exchange taken from the Yahoo finance website and processed with the help of data analysis tools and solvers in excel, as follows: .

Table 3: Average Return and Risk Index Value30 Data on the Indonesia Stock Exchange

	Adaro Energy Tbk.	Bank Pembangunan Daerah Jawa	Elnusa Tbk.	Indo Tambangraya Megah Tbk.	Bukit Asam Tbk.	PP (Persero) Tbk.	United Tractors Tbk.	Average
	ADRO	BJBR	ELSA	ITMG	PTBA	PTPP	UNTR	
Return	2.15%	2.34%	0.31%	2.29%	1.57%	-0.25%	1.02%	**1.35%**
Var	1.54%	3.10%	1.92%	2.64%	1.70%	2.31%	0.87%	
Std Dev	12.42%	17.60%	13.84%	16.23%	13.05%	15.20%	9.33%	**13.96%**

Data source: www.yahoo.finance.com which is processed

From table 3 above, it is known that the average stock return on the Value30 index is 1.35% and the average standard deviation is 13.96%.

Table 4: Data on Average Return and Risk of Growth30 Index on the Indonesia Stock Exchange

	Ace Hardware Indonesia Tbk.	Bank Central Asia Tbk.	Bank Rakyat Indonesia (Persero) Tbk.	Charoen Pokphand Indonesia Tbk	Erajaya Swasembada Tbk.	Tower Bersama Infrastructure Tbk.	Sarana Menara Nusantara Tbk.	Average
	ACES	BBCA	BBRI	CPIN	ERAA	TBIG	TOWR	
Return	1.22%	1.47%	1.24%	1.20%	3.00%	1.45%	1.08%	**1.52%**
Var	0.84%	0.27%	0.64%	1.20%	3.64%	1.60%	1.00%	
Std Dev	9.15%	5.24%	7.98%	10.97%	19.07%	12.63%	10.01%	**10.72%**

Data source: www.yahoo.finance.com which is processed

Meanwhile, from table 4, it is known that the average stock return on the Growth30 index is 1.52% and the average standard deviation is 10.72%.

Based on the processed results and data analysis, it can be concluded that stocks that are included in the Growth30 index produce better performance than stocks from the Value30 index, because of their ability to generate a larger average return with a lower level of risk.

Correlation is a measure of the consistency or tendency of two investments to act in the same way. If there are 7 stocks in the portfolio, then there are 21 stock correlations or combinations that occur. According to the combination formula below, the number of shares or objects (n) is 7 and the correlation between shares (r) is 2. So the result is 21.

$$C = \frac{n!}{r!\,(n-r)!}$$

$$= \frac{7!}{2! \cdot (7-2)!}$$

$$= \frac{7!}{2! \cdot 5!}$$

$$= \frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{2 \cdot 1 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$$

$$= 21$$

Because there are 7 stocks selected for the sample of each index, then the total correlation for the 2 stock indices is 21 correlations. The following is the result of the calculation of the correlation between the stocks that occurred.

Table 5: Correlation Between Stocks for the Value30 Index on the Indonesia Stock Exchange

	ADRO	*BJBR*	*ELSA*	*ITMG*	*PTBA*	*PTPP*	*UNTR*
ADRO	1						
BJBR	0.190034992	1					
ELSA	0.3290365	0.160064	1				
ITMG	0.701708175	0.167778	0.422902	1			
PTBA	0.671069604	0.228563	0.316432	0.623445	1		
PTPP	0.269004717	0.303107	0.43926	0.371158	0.31553	1	
UNTR	0.481237462	0.219692	0.182934	0.353322	0.476803	0.309816	1

Data source: www.yahoo.finance.com which is processed

Based on table 5 above, it is known that the overall correlation value between stocks on the Value30 index is positive between values 0 and 1, this indicates that the characteristics of stocks on the Valuie30 index have the same characteristics, which are not optimal if a portfolio is to be formed.

Table 6: Correlation Between Stocks for the Growth30 Index on the Indonesia Stock Exchange

	ACES	*BBCA*	*BBRI*	*CPIN*	*ERAA*	*TBIG*	*TOWR*
ACES	1						
BBCA	0.316736	1					
BBRI	0.338467	0.679816	1				
CPIN	0.319627	0.234951	0.257265	1			
ERAA	0.187032	0.260755	0.159268	0.178116	1		
TBIG	0.062191	0.203965	0.033102	0.0047	0.226924	1	
TOWR	0.111989	-0.0058	0.111383	0.003889	0.022021	0.208621	1

Data source: www.yahoo.finance.com which is processed

Similar to the Value30 index, as well as the Growth30 index, most of them have a positive correlation value between values 0 and 1, but with an average correlation value that is much smaller than stocks on the Value30 index and there is a negative correlation value between stocks. TOWR with BBCA. These results show that the stock portfolio on the Growth30 index is more optimal when compared to stocks on the Value30 index. The covariance value can be expanded as $Cov(R_1,R_2) = \rho_{12}\sigma_1\sigma_2$ where ρ_{12} is the correlation of each stock and σ_1 is the stock standard deviation 1 and σ_2 is the stock standard deviation 2. So if the correlation of each stock is positive, then the covariance is also positive.

Table 7: Data on Covariance Between Stocks on the Value30 Index on the Indonesia Stock Exchange

	ADRO	***BJBR***	***ELSA***	***ITMG***	***PTBA***	***PTPP***	***UNTR***
ADRO	0.015437						
BJBR	0.004106	0.030982					
ELSA	0.005592	0.003854	0.019167				
ITMG	0.013983	0.004737	0.009391	0.026356			
PTBA	0.010752	0.005188	0.005650	0.013052	0.017039		
PTPP	0.005020	0.008013	0.009134	0.009050	0.006186	0.023113	
UNTR	0.005509	0.003563	0.002334	0.005285	0.005735	0.004340	0.008699

Data source: www.yahoo.finance.com which is processed

Table 8: Data on Covariance Between Stocks on the Growth30 Index on the Indonesia Stock Exchange

	ACES	***BBCA***	***BBRI***	***CPIN***	***ERAA***	***TBIG***	***TOWR***
ACES	0.008364						
BBCA	0.001499	0.002743					
BBRI	0.002440	0.002806	0.006365				
CPIN	0.003168	0.001333	0.002224	0.012030			
ERAA	0.003222	0.002573	0.002394	0.003680	0.036357		
TBIG	0.000710	0.001333	0.000330	0.000064	0.005401	0.015961	
TOWR	0.001013	(0.000030)	0.000879	0.000042	0.000415	0.002607	0.010026

Data source: www.yahoo.finance.com which is processed

To determine the optimal portfolio, by using the coefficient of variance (CV) as the basis for calculation. The optimal portfolio is the portfolio that has the smallest CV.

$$CV = \frac{\sigma_p}{E(R_p)}$$

CV = coefficient of variance
p = standard deviation / portfolio risk
E (Rp) = expected return portfolio

Table 9: Comparison of Value30 and Growth30 Index Portfolio Optimization Results using Markowitz Model and Sharpe Model

Remark	IDX Value30		IDX Growth30	
	Markowitz	Sharpe	Markowitz	Sharpe
Covariance	0.26%	0.38%	0.04%	0.05%
Variance	0.39%	0.84%	0.16%	0.18%
Variance+Covariance	0.64%	1.21%	0.20%	0.24%
Std Dev	8.02%	11.01%	4.46%	4.88%
Return	1.08%	2.23%	1.36%	1.54%
CV	7.426	4.937	3.279	3.169

Data source: www.yahoo.finance.com which is processed

From table 9, it is known that when using the Markowitz Model by considering the smallest portfolio risk, the CV portfolio at the Value30 index is 7,426 and the Growth30 index is 3,279. Meanwhile, when using the Sharpe model, the CV portfolio index Value30 is 4,937 and the Growth30 index is 3,169. Seeing the results of this calculation, it can be concluded that the use of the Sharpe Model is considered more optimal for both the Value30 index and the Growth30 index, because it produces a smaller CV value than the Markowitzl Model.

To obtain the proportion of shares that are considered optimal for the Value30 index, the following steps are taken:

Table 10: Comparison of Optimal Stock Proportion Value30 Index Using Markowitz Model and Sharpe Model

Stock	Markowitz	Sharpe
ADRO	9%	55%
BJBR	9%	32%
ELSA	20%	0%
ITMG	0%	12%
PTBA	2%	0%
PTPP	4%	0%
UNTR	55%	0%
Total Proportion	**100%**	**100%**

Data source: www.yahoo.finance.com which is processed

From table 10 above, it is known that the optimal proportion of funds for stocks on the Value30 index using the Markowitz Model is dominated by more than 50% by UNTR stocks. dominated by more than 50% by ADRO shares, this happens because ADRO shares have the largest Sharpe ratio, according to the results in the following table:

Table 11. Recapitulation of Data Return, Risk and Sharpe Ratio Index Value30 on the Indonesia Stock Exchange

	Adaro Energy Tbk.	Bank Pembangunan Daerah Jawa Barat dan Banten	Elnusa Tbk.	Indo Tambangraya Megah Tbk.	Bukit Asam Tbk.	PP (Persero) Tbk.	United Tractors Tbk.
	ADRO	BJBR	ELSA	ITMG	PTBA	PTPP	UNTR
Return	2.15%	2.34%	0.31%	2.29%	1.57%	-0.25%	1.02%
Var	1.54%	3.10%	1.92%	2.64%	1.70%	2.31%	0.87%
Std Dev	12.42%	17.60%	13.84%	16.23%	13.05%	15.20%	9.33%
Risk Free	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%
Sharpe Ratio	14.46%	11.31%	-0.29%	11.94%	9.35%	-3.96%	7.15%

Data source: www.yahoo.finance.com which is processed

Meanwhile, the optimal share proportion for the Growth30 index is as follows:

Table 12: Comparison of Optimal Stock Proportions for Growth30 Index Using Markowitz Model and Sharpe Model

Stock	Markowitz	Sharpe
ACES	7%	2%
BBCA	63%	70%
BBRI	0%	0%
CPIN	8%	3%
ERAA	0%	9%
TBIG	4%	3%
TOWR	18%	14%
Total Proportion	**100%**	**100%**

Data source: www.yahoo.finance.com which is processed

From table 12, it is known that the optimal proportion of funds for shares in the Growth30 index for both the Markowitz Model and the Sharpe Model is dominated by more than 50% by BBCA shares, this happens because BBCA shares have the smallest level of risk measured by standard deviation, also has the largest Sharpe ratio, according to the results in the table as follows:

Table 13. Recapitulation of Data Return, Risk and Sharpe Ratio Growth Index 30 on the Indonesia Stock Exchange

	Ace Hardware Indonesia Tbk.	Bank Central Asia Tbk.	Bank Rakyat Indonesia (Persero) Tbk.	Charoen Pokphand Indonesia Tbk	Erajaya Swasembada Tbk.	Tower Bersama Infrastructure Tbk.	Sarana Menara Nusantara Tbk.
	ACES	BBCA	BBRI	CPIN	ERAA	TBIG	TOWR
Return	1.22%	1.47%	1.24%	1.20%	3.00%	1.45%	1.08%
Var	0.84%	0.27%	0.64%	1.20%	3.64%	1.60%	1.00%
Std Dev	9.15%	5.24%	7.98%	10.97%	19.07%	12.63%	10.01%
Risk Free	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%
Sharpe Ratio	9.46%	21.33%	11.07%	7.72%	13.91%	8.67%	7.30%

Data source: www.yahoo.finance.com which is processed

CONCLUSION

Based on the results of the study, it can be concluded that the use of the Sharpe Model provides more optimal results than the Markowitz Model in portfolio formation both on the Value30 index stock and the Growth30 index with the proportion of funds being dominated by ADRO stocks for the Value30 index and BBCA stocks for the Growth30 index.

ACKNOWLEDGMENT

In conducting this research, I had many discussions with my lecturers in corporate finance and accounting from Universitas Bakrie and was assisted in the data collection process by students from Magister Management Study Program at Universitas Bakrie.

REFERENCES

Asness, C., Frazzini, A., Israel, R., & Moskowitz, T. (2015). Fact, fiction, and value investing. Journal of Portfolio Management; New York, 42(1), 34–52.

Brigham, Eugene F., & Joel F. Houston, (2010), Fundamentals of Financial Management, 13th Edition, South-Westren Cengage Learning, Mason – United States of America, 45040.

Bakke, M. (2014). Help Wanted? The Mixed Record of Foreign Fighters in Domestic Insurgencies. International Security, 38 (4), 150-187.

Chumilla. (2018). A. Portfolio Theory: Optimal Asset Allocation. Final Thesis Of The Bachelor's Degree In International Business And Marketing (Esci-Upf).

Cussen, Mark P. (2021, August). "Value or Growth Stocks: Which Is Better?". Investopedia.

Fahmi, Irham. (2012). Pengantar Pasar Modal. Bandung: Alfabeta.

Gabler, Andreas. (2019). An Extension of Markowitz' Modern Portfolio Theory for Long-Term Equity Investors. EBS Universität für Wirtschaft und Recht, EBS Business School.

Hartono, J. (2017). Teori Portofolio dan Analisis Investasi. (Kesebelas). Yogyakarta: BPFE

Ibbotson, Roger G. & Harrington, James P. (2021). Stocks, Bonds, Bills, and Inflation® (SBBI®): 2021 Summary Edition (July 26.

Jogiyanto, H. (2017). Teori Portofolio dan Analisis Investasi Edisi 11. Yogyakarta: BPFE

Mayfi & Rudianto, D. (2014). Analisis Pengaruh Faktor Internal Dan Eksternal Perusahaan Terhadap Return Saham. MIX: Jurnal Ilmiah Manajemen. Universitas Mercu Buana. Jakarta.

Mokta. (2013). Markowitz Portfolio Model: Evidence from Dhaka Stock Exchange in Bangladesh, IOSR Journal of Business and Management, 8(6), pp : 68- 73.

Pettengill, G., Chang, G., & Hueng, C. J. (2014). Choosing between value and growth in mutual fund investing. Financial Services Review; Atlanta, 23(4), 341–359.

Pramono, . E. S. ., Rudianto, D. ., Siboro, F. ., Abdul Baqi , M. P. ., & Julianingsih, D. (2022). Analysis Investor Index Indonesia with Capital Asset Pricing Model (CAPM). Aptisi Transactions on Technopreneurship (ATT) Journal, 4(1), 38–49.

Rudianto, D. (2012). Analisis Perbandingan Kinerja Keuangan PT Telkom, Tbk Dengan PT Indosat Tbk Periode 2005-2010. Business and Management Review Journal. Universitas Bakrie. Jakarta. .

Sirucek & Kren. (2015). Application of Markowitz Portfolio Theory by Building Optimal Portfolio on the US Stock Market. Ceko : ACTA Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis Journal.

Solanki, Ashvinkumar H. (2014). Portfolio Selection Process through Markowitz Model. Indian Journal of Applied Research, 4(8), pp : 356-358.

Tandelilin, E, (2017), Pasar Modal: Manajemen Portofolio & Investasi, Cetakan ke-1, PT Kanisius, Daerah Istimewa Yogyakarta 55281.

Wang, J. (2011). Impact of investment horizon on the performance of value versus growth styles and style allocation. Journal of Asset Management; London, 12(6), 438–446.

Widoatmodjo, S. (2015). Pengetahuan Pasar Modal Untuk Konteks Indonesia. Jakarta: Kompas Gramedia.

