

Assesment of Portfolio Return Performance in the Indonesian Capital Market

Renea Shinta Aminda*

Faculty of Economic and Business

Ibn Khaldun University

Bogor, Indonesia

*renea_shinta@yahoo.com

Abstract—The selection of portfolios from many issuers is intended to reduce the risk borne and have optimal portfolio performance in the market. The research carried out aims to find out the magnitude of issuers and their constituents in the Indonesian capital market continued to assess the performance of the portfolio formed with the best N in the Indonesian capital market, the observation period of the research conducted (January 2008 - December 2016) where the object of research is all companies listed on the Indonesia Stock Exchange with Purposive Sampling method, 50 issuers were selected as samples based on proportional combinations of 336 issuers with active transaction criteria and complete prices. Starting with establishing a portfolio of diversified sectors in the capital market, then portfolio performance was measured using the Jensen alpha index. There were 12 listed companies in the most optimal portfolio in obtaining diversified benefits, with a combination of issuers that provided the smallest risk with a certain rate of return and became an Optimal portfolio, consisting of a combination of 6 industrial sectors. The portfolio performance measurement results show portfolio performance below market performance or negative value but the systematic risk value is also below the market, the bet value <1 so it is in line with the purpose of forming a portfolio so it is said that the resulting portfolio has a good level of toughness and becomes an option Bali investor in the capital market.

Keywords: *risk, return, portfolio performance, Jensen alpha index*

I. INTRODUCTION

In dealing with the risk of an investor faced with the uncertainty of investing in shares, according to Markowitz rationality is needed for consideration: 1) the maximum return at a certain risk level or 2) at the minimum risk level with a certain return [1]. Mao states that to reduce risk on investment, theoretically, it is done by diversifying shares through the formation of stock portfolios, although the nature of the stock portfolio does not eliminate risk but is mitigating [2]. Certain calculation procedures need to be carried out in relation to minimizing risk and maximizing the yield, which can be achieved by forming an optimal portfolio, through simulating a number of stocks available to get the minimum value of risk on certain returns.

Markowitz, first coined the basic theory of portfolio selection. The issue of how to allocate funds to bring returns but with the smallest risk is discussed in portfolio selection [1]. Identification of which stocks will be selected and what proportion of funds will be invested in each of those shares is included in the formation of the portfolio. Evans and Archer conducted the first study to determine how the most ideal number of shares in obtaining optimal diversification benefits, said in his research that when the portfolio has reached eight to ten shares with the same weight, even though random diversification has been carried out, there will be very few benefits of diversification [3].

Some of the benefits of diversification include a total risk reduction of 51%, with a portfolio of 10 shares according to Elton and Gruber as a continuation of similar research with the above study where the results are also almost the same [4]. Furthermore, when the portfolio totals 20 shares, the risk decreases to 56% or experiences a 5% decrease compared to a Portfolio of 10. If the portfolio is 30, he can only reduce risk by 2% when compared to the 20 portfolio. 50 shares. In a portfolio of 20 shares is the minimum needed to obtain the benefits of diversification in equity [5]. While Statman compares the marginal benefit of diversification against marginal cost and concludes that at least 30 shares are needed optimally for portfolio diversification, investors can calculate the marginal benefit of diversification by comparing the expected returns of a 30-stock portfolio, to the expected return of a 500-stock portfolio, leverage so that the expected standard deviation is the same as the expected standard deviation of a 30 stock portfolio [6]. Subsequent research is similar to statman according to Campbell et al., the optimal number of shares of about 50 shares, the value of the correlation of marginal benefits versus marginal costs which decreases, will increase the marginal benefit of diversification [7].

Another very extreme opinion was expressed by Wasik [8] and the National Association of Investor Corporation (representing 8,000 stock club choices), recommending that investors in his portfolio total at least 5 shares (this rule is known as the Rule of Five). From the understanding of the rule of five, if only a portfolio of 2 shares, there will be a tendency for both stocks to become losers, while if the portfolio is only

three, it will give mediocre results, but with a portfolio of 5 shares the result can be said to be a true winner.

From previous research and research findings, optimal portfolio information is obtained, can be diversified in the amount of between 5 to 10 shares, or at least 12 shares to get a minimum risk value without reducing the amount of return. Where the average value of the stock portfolio of retail investors is large enough so that the size of the portfolio is not a dominant factor. So it is necessary to do an analysis and in-depth understanding of the number of shares in a portfolio including assessing the performance of a portfolio formed in the Indonesian capital market 1.2 Problem Formulation or Problem Identification:

Based on this background, the research problems formulated are as follows:

- To achieve a minimum level of risk with a certain rate of return what is the number of issuers in one optimal portfolio on the Indonesian capital market?
- What is the performance of the portfolio with the Alpha Jensen method of the amount and components formed in the stock portfolio on the Indonesian capital market?

II. METHODS

A. Population and Research Samples

The share price on the Indonesia Stock Exchange from January 2008 to December 2016 is the population in this study. The number of samples representing the population of issuers on the Indonesia Stock Exchange will be chosen based on the representation of Gay and Diehl Opinion selected from 2008 to 2016 it is assumed that the more samples taken, the more representative they will be so that the generalization of results can be done [9]. The type of research will determine the sample size received. The population consisting of 336 Issuers required a minimum sample of 34 Issuers to fulfill 10% but to better represent the representation of all issuers in 9 sectors, the researchers completed them into 50 sample issuers or 14.8% of the population according to the opinions expressed by Gay and Diehl is said to require a sample of at least 10% of the population in descriptive research [9]. So according to the provisions according to Gay of 10% if descriptive research can be represented by 10 percent of the population (at least 20% for very small populations) and for research populations are represented by 30 objects so that those who do not meet active criteria and prices are available fully excluded, and a daily stock price of 336 listed companies [9]. The random number method according to which the sample is referenced is more than 30 and less than 500 is appropriate for most studies that take using excel where the machine will choose randomly sampled from proportional percentages which are proportional percentage distributions. The minimum acceptable size based on the type of research is descriptive research = 10 percent of the population, but for a very small population a minimum of 20 percent is needed said by Gay [9], If the object is less than one hundred, it is better to take everything so his research is

population, but if the number of objects is large, it can be taken 10-15% or more Opinion said by Arikunto [10].

The operational definitions and measurement of variables related to portfolio formation are as follows:

1) *Return on portfolio expectations (R_p)*: The expected return of the portfolio can be estimated by calculating the weighted average of expected returns of individual assets in the portfolio, the percentage of portfolio investment value for each individual asset in the portfolio is referred to as the portfolio weight symbolized by "W" [11].

The formula for calculating the expected return of a portfolio is as follows:

$$E(R_p) = \sum_{i=1}^n W_i E(R_i) \tag{1}$$

In This Case:

E(R_p) = Expected return of the portfolio

W_i = Weight of the Issuer portfolio i

$\sum W_i$ = Total portfolio weight = 1.0

E(R_i) = Return expectations from the i-the Issuer

n = Number of Securities-Issuers in a portfolio

2) *Varian's return portfolio (σ_p²)*: The measurement used for n-issuers is the return variance of n-issuers in a portfolio is mathematically as follows [11].

$$\sigma_p^2 = \sum_{i=1}^n W_i^2 \sigma_i^2 + \sum_{i=1}^n \sum_{j=1}^n W_i W_j \sigma_{ij} \tag{2}$$

Where:

σ_p² = Varian's return portfolio

σ_i² = Varian's return Emiten i

σ_{ij} = Covarians between return emiten I and j

W_i = Weight or portion of funds invested in the Issuer

$\sum_{i=1}^n \sum_{j=1}^n$ = double addition sign, meaning *n*² will be added accordingly together (all possible pair I and j values)

If part of the first equation:

$\sum_{i=1}^n W_i^2 \sigma_i^2$, portfolio weights are assumed to be the same for each issuer, then the portion of funds invested (*w*)

Will Be:

$$\sum_{i=1}^n ((1/n)^2 \sigma_i^2) = \frac{1}{n} \sum_{i=1}^n \sigma_i^2 / n$$

Furthermore, the equation is simplified to:

$$\sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^n W_i W_j \sigma_{ij}$$

3) *Coefien varians portfolio (CV_p)*: Tandelilin risk per unit relative to the level of return on portfolio expectations (see Figure 1) [11]:

$$CV_p = \frac{\sigma_p}{E(R_p)} \quad (3)$$

σ_p = Varians Portfolio
 $E(R_p)$ = Expected Return Portfolio

Where:

CV_p = Covarians Portfolio

No.	Variable	Definition	Scale	Measurement
1	Portfolio Performance with Alpha Jensen (adoption of CAPM)	Jensen's Alpha formula is an index that explains the difference in the actual rate of return obtained by the portfolio with the expected rate of return if the portfolio originates on the capital market line	Ratio	$R_p - R_f = \alpha + \beta_p[R_M - R_f] + e_i$ $\alpha_p = (\bar{R}_p - \bar{R}_{BR}) - \beta_p(\bar{R}_M - \bar{R}_{BR})$. In This Case: α_p = Jensen's Alpha \bar{R}_p = Average portfolio return certain period \bar{R}_{BR} = average return on free Assets risk-free certain periode \bar{R}_M = Average market return period t Certain β_p = Beta portofolio p $\bar{R}_p - \bar{R}_{BR}$ = Average portfolio risk premium (portfolio risk premium) $\bar{R}_M - \bar{R}_{BR}$ = Rata-rata premium risiko pasar (Market Risk Premium)

Fig. 1. Operational definition research variables.

III. RESULTS AND DISCUSSION

A. Formation of Optimal Portfolios by Determining Size of the Number of Issuers

The simulation of risk value and portfolio return on the ranking of one combination of stock portfolios in each value

of the size of shares in the portfolio through a comparison of the determination of the size of shares in the formation of the portfolio where the analysis can be seen in figure 2 as follows.

| No Portfolio Size Combination Portfolio Risk |
|--|--|--|--|
| 1 | Size n emiten =10 dari N=50 emiten | 0.0448791 | 0.0059531 |
| 2 | Size n emiten =12 dari N=50 emiten | 0.0278567 | 0.0055077 |
| 3 | Size n emiten =14 dari N=50 emiten | 0.2772008 | 0.019227 |
| 4 | Size n emiten =16 dari N=50 emiten | 0.2457016 | 0.0179054 |
| 5 | Size n emiten =18 dari N=50 emiten | 0.1981391 | 0.0164481 |

Fig. 2. Value of risk and return of portfolios in various sizes at N 50 formation of optimal portfolios.

From figure 2 on the size of the issuer as many as 12 shares from 50 existing issuers with a risk value (standard deviation of) 2.78% has the lowest risk value in each portfolio category, then for the second optimal portfolio size of 10 shares of 50 shares in its portfolio where the risk value is 4.48%, then the third portfolio has n size n = 18 with a magnitude of portfolio risk of 19.81% which has the smallest risk so that it also proves that the more n values in the portfolio the less risk faced the results of the analysis, in contrast to the results Tandelilin's research on the optimal portfolio size in Indonesia totaling 14 shares in its portfolio, while applied by mutual funds in Indonesia in the formation of stock portfolios in orchid mutual funds, rose mutual funds and sector commodity rose mutual

funds composed of 10 shares in each portfolio it offers, simulation and calculation p there are various n size combinations in different simulations and theoretically done in different studies. Based on the calculation of the smallest risk magnitude calculation in a portfolio combination where the size of 12 out of 50 selected issuers, to then be made optimal portfolio return modeling that is formed, continued to calculate the optimal portfolio performance, then compared to market performance, In the condition of Investors who have characteristics of Risk investors Takers will tend to take the number of issuers N = 14 in each portfolio with consideration of the highest return value compared to the combination of issuers 10, 12, 16 and 18, where the magnitude of return is

1.9%, with the risk faced by the portfolio the number of $N = 14$ is greater than $N = 12$, this is in accordance with the theory which states that the highest rate of return with a certain amount of return. The risk and return relationship is linear and unidirectional, and technically, the higher the expected return, the higher the risk faced by investors and vice versa [12]. Analysis of the Amount of Issuers and Portfolio Forming Components to achieve a minimum level of risk with a certain level of return in the portfolio in the Indonesian Capital market.

Through a series of processes and procedures for the formation of portfolios in this research activity is in accordance with the Markowitz portfolio theory where the process consists of calculation of returns, correlations between issuers, standard deviation portfolios, variance and portfolio covariance then the optimal number of shares in the portfolio through technical and fundamental analysis it can be concluded as many as 12 [1]. Almost all investors theoretically understand the benefits of diversification in reducing risk, and then many investors in practice as transaction agents in the Indonesian capital market do not fully implement it. In line with the objectives of portfolio formation [13], the results of 50 samples of listed companies are obtained that the value of risk is the smallest After simulating various sizes of issuers in a portfolio (with sizes $N = 10$, $N = 12$, $N = 14$, $N = 16$ and $N = 18$), the hypothesis formation which was stated to be in line with the results of research found by The Wall Street Journal, August, 2 in 1990 was 12-15 shares, Reilly and Brown as many as 12-18 shares [14], The Rewards and Pitfalls of High Dividends Stocks [15], then J. Bamford, J. Blyskal, E. Card, and A. Jacobson, Complete Guide to Managing Your Money, Mount Vernon, NY, Consumers Union in 1989 for 12 shares or more.

Portfolio combination in all sizes of portfolio formation in the Indonesian capital market, and is the main alternative choice because it has the lowest risk, and among the best portfolio combination sizes is the number of portfolios with $N = 12$ seen from the optimal risk value and portfolio return in various stock sizes for each portfolio that has the lowest risk value for each portfolio category, obtained in the study of the lowest portfolio risk on a stock size of 12 issuers out of 50 existing issuers whose risk value (variance is) 2.78%, then the optimal portfolio size of the two research results, with a share size of 10 issuers out of 50 listed companies in its portfolio, the value of the risk is 4.48%, and portfolio size $n = 18$ out of 50 issuers whose portfolio risk value is 19.8%, so the results of the study are in accordance with the findings of several researchers before like J. Bamford, J. Blyskal, E. Card, in 1989 mentioned a recommendation for a minimum number of shares in a portfolio of 12, in line with Reilly and Brown said in the portfolio the minimum number of shares was 12-15 shares [14], so the results of the research carried out were relevant both numerically and theoretically, regarding the optimal portfolio size in Indonesia in a different view on the practical level of portfolio formation practically applied temporarily, departing on the preference and option of determining leading stocks, for example the rose mutual fund focus 10 is known that this Mutual Fund invests only in 10 shares with the same proportion. Second, the Reksa Dana 10 focus is managed semi-actively, with the condition of the choice of shares that can be

determined by the market (based on capitalization on the top IHSG 16-30), but the selection of 10 shares as a portfolio forming is based on certain fundamental criteria that become The main requirement.

The results in the above studies are very different from the findings of this study, which turns out that with a total of 10 shares in its portfolio, the risk faced by investors is in the second position with a risk of 4.48%, it can occur due to several conditions such as existing issuers in the portfolio represented by all sectors in the capital market in Indonesia or sector rotation strategy is not an assumption of an approach in the calculation and formation of a portfolio in previous research. Another interesting research finding is that the portfolio formation criteria are not based on asset class / classification that has been set by investment fund companies based on investment management company preferences based on superior sectors, but the optimal portfolio is represented by several stock sectors, so it is in accordance with the theory presented by Mao, who suggested investing not only in one type but diversifying in several investment sectors in the hope that it would be able to minimize risk and maximize yield or vice versa maximize yield and minimize risk [2].

The optimal stock size results in the portfolio are 12 obtained from conducting experiments on various stock sizes, on one portfolio (where the sizes $N = 10$, $N = 12$, $N = 14$, $N = 16$ and $N = 18$) from 50 sample issuers. selected, then proceed to look for the risk value and return of 1000 portfolio combinations conducted on all sizes of shares in all portfolios (can be seen in appendix 6), the combination of restrictions refers to that the number of minimum portfolio size combinations.

Calculation of portfolio risk and portfolio return calculation in each N shares in the portfolio is carried out, by taking a sample of 1% (top 10 portfolios in each portfolio size formed) in each combination of N portfolio shares based on the criteria for the smallest portfolio risk value performed by detailed and complete portfolio stocks with the smallest risk in each size of the portfolio shares taken 10 Portfolios in each size with the smallest risk of 1000 combinations per portfolio formed as follows.

B. Discussion on Portfolio Performance from the Number and Components Formed in a Portfolio of Shares in the Indonesian Capital Market

The objective is to find out the performance and systematic risk of 10 optimal portfolios that have been formed based on the Jensen's Alpha measurement model adopted from the Capital Asset Pricing Model (CAPM). Why did alpha Jensen's choose as a measure of portfolio performance measure due to the Sharpe index gauge (Reward to variability = RVAL) and Treynor Estimator (Reward to volatility = RVOL) are actually the angle gauges of the Portfolio. The greater the angle or slope of the portfolio, the better the portfolio performance [16], in addition to the portfolio performance angle, also determined by the intercept the higher the interception, the higher the portfolio return so that in this study the portfolio performance calculation approach using alpha Jensen's method, as for the

factors that are expected to affect the performance of 10 optimal Portfolios that have been formed (Portfolio AJ) N issuers of optimal portfolios, using the BI interest rate as a benchmark and the index-issuers that are generally listed companies capitalizing large stocks and the level of investor tolerance towards risk, by taking data from the period January 2008 to December 2016 (total data series / n = 108 months), for optimal portfolio data formation, the Risk Free Market (RFM) data is obtained from the monthly performance index Composite Stock Price (CSPI) as Market I and performance Monthly LQ 45 as Market II and Risk Free Rate (RFree) of BI Rate is divided per 12 months can be seen in Appendix V.

The CAPM theory states that in equilibrium conditions the value of alpha is zero ($\alpha = 0$), but to assess and identify whether mutual funds and portfolio product formations are superior or inferior in portfolio performance, Jensen's believes it is necessary to add alpha values where Alpha Jensen's criteria as follows: (1) if alpha (α) is positive indicates superior performance (outperform the market), (2) if alpha (α) is negative indicates inferior performance (underperform the market), (3) if alpha (α) zero shows that performance is proportional to market performance.

From the analysis carried out using Tools Eviews 9 by regressing the portfolio risk premium ($[TR]_{(p)} - R_{BR}$) as dependent with the reduction in return value 10 Portfolios formed in reducing Risk Free Market 1 in this case are represented by returns from monthly performance IHSG is reduced by the Risk Free Rate (BI Rate) as independent, where the results of the analysis output obtained in figure 3 are as follows.

Portfolio	Nilai Alpha (α)	Prob	Nilai Beta (β)	Information
A	-0.112941	0.0102	0.762397	Signifikan
B	-0.107348	0.0039	0.775837	Signifikan
C	-0.096918	0.0250	0.797944	Signifikan
D	-0.120385	0.0024	0.745576	Signifikan
E	-0.074156	0.0743	0.832612	Signifikan
F	-0.139026	0.0021	0.709087	Signifikan
G	-0.085999	0.0461	0.815926	Signifikan
H	-0.064876	0.1041	0.850948	Not Signifikan
I	-0.161502	0.0003	0.661322	Signifikan
J	-0.109618	0.0055	0.764951	Signifikan

Data Sources: Processing Data with eviews 8

Fig. 3. Jensen's alpha index and significance value 10 portfolios (A-J) with market I (CSPI).

From figure 3 above, it is obtained that all optimal portfolios have significant alpha and beta values, only portfolio H whose alphabet is not significant, it is also known that the best performing portfolio is the optimal portfolio formed by E, which is the best among existing portfolio formations, because even though the portfolio returns performance underperform of minus 7% is significant with a confidence level of 10%. known by alpha jensen's model, the alpha value (α) is negative, it means that the performance of 10 Portfolios formed shows

inferior performance (underperform the market), or it can be said that the performance of 10 Portfolios formed under market performance that is JCI return (Market 1) is negative at average alpha alpha 0.10 means that H_0 is not rejected, which is reflected in the probability value below 0,000 <0.005, because the probability value for all portfolios other than H portfolio is 0.0000, then the coefficient value is significant, meaning that the market is efficient so that the product 10 formed portfolio cannot take profit from Market1 (CSPI).

B value is a systematic measure of the issuer relative to market portfolio risk can be seen from its beta value below 1 ($\beta < 1$) means that changes in return 10 Portfolio formed is smaller than Market return (IHSG Return), This occurs because the basis for the formation of its portfolio in the issuer with the lowest risk so that although it is safe enough but the return value it gets is below the market return, the β value for the market portfolio is worth 1, a portfolio that has a beta <1 is said to be less risk than market portfolio risk or has a smaller systematic risk rather than market risk of 0.83 even though the expected value of the portfolio return is smaller than the expected market portfolio return.

Data processing is then performed using Tools Eviews 9 by regressing the reduction in the return value of 10 Portfolios formed by reducing Risk Free Market 2 (LQ45) in this case represented by returns from LQ45 monthly performance minus Risk Free Rate (BI Rate), the results of the analysis output obtained in the figure 4 as follows;

Portfolio	Nilai Alpha (α)	Coefficient	Nilai Beta (β)	Information
A	-0.148863	0.0003	0.695202	Signifikan
B	-0.156133	0.0001	0.689604	Signifikan
C	-0.147909	0.0014	0.707848	Signifikan
D	-0.171047	0.0001	0.656186	Signifikan
E	-0.072808	0.0586	0.832696	Signifikan
F	-0.139027	0.0011	0.707176	Signifikan
G	-0.143822	0.0021	0.713998	Signifikan
H	-0.120638	0.0059	0.752481	Signifikan
I	-0.144621	0.0004	0.688657	Signifikan
J	-0.148863	0.0003	0.695202	Signifikan

Data Sources: Secondary data processing with eviews 8

Fig. 4. jensen's alpha index and significance value 10 optimal portfolios (A-J) with market II (LQ45).

From figure 4 above, it is known that all optimal portfolio alpha formations are significant at the level confidence of 1% and 5%. From figure 4 it is also known that the portfolio with the best performance is the optimal E-formed portfolio, which is the best among the existing portfolio because even though the portfolio return performance is underperform of minus 7%, significant with a confidence level of 5%. known by the Alpha Jensen's model obtained negative alphabet (α) value means that the performance of 10 portfolios formed shows inferior performance (underperform the market), it can be said the performance of 10 Portfolios formed under market performance namely Return LQ45 (Market II) is negative at

alpha 0, 10 means that H_0 is not rejected, which is reflected in the probability value below <0.10 , because the probability value for all portfolios is 0,000, so the coefficient value is significant, meaning that the market is efficient so that the product 10 formed portfolio cannot take advantage of the existing Market II (LQ45). While the β value is a systematic measure of the issuer relative to market portfolio risk, it can be seen from the beta value that the value is below 1 ($\beta < 1$). The β value for the market portfolio is worth 1, an issuer that has a Beta < 1 is said to be less risky than the market risk, whereas an issuer that has a Beta value > 1 is said to have a systematic risk that is greater than market risk. If an issuer has a beta equal to the market portfolio beta or equal to 1 of 0.82, it is expected to get more expected returns than market expectation returns.

IV. CONCLUSIONS

This research is based on the optimal portfolio formation, which is obtained from selected stocks in 9 industry sectors in the Indonesian stock market and is continued to make a modeling of the return portfolio formed and to assess the performance of the resulting portfolio formation. Obtained from the analysis and discussion of research conclusions as follows;

- The number of issuers for portfolios in the Indonesian capital market is 12 in each portfolio, where the combination of its constituents consists of 6 industrial sectors, to achieve a minimum level of risk with a certain rate of return, different from conventional and applicable sizes, on Indonesian portfolio issuers obtained as many 10 in each portfolio, where the combination of portfolio makers consists of the banking sector, the trade / manufacturing sector and the financial sector.
- Optimal portfolio performance results formed shows that the value of performance (α) 10 Optimal portfolio is formed under market performance where the optimal portfolio return is below the IHSG return (Market I) and LQ45 (Market II) yields, however, at the value of β that is a systematic measure of the issuer relative to market

portfolio risk, the optimal portfolio formed has a beta < 1 meaning less risk than market portfolio risk or has a smaller systematic risk than market risk.

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