



Investor behavior in evaluating portfolio performance: do investor behave rationally?

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ABSTRACT

Financial theory assumes that investors are rational individuals. However, several empirical studies show that investors tend to act contrary to financial theory and cannot be explained in models based on investor rationality. How does investor behavior in making investment decisions relate to evaluating portfolio performance? This study applies mixed methods to prove portfolio performance evaluation through optimal portfolio formation and reveals its usefulness in making investment decisions. This study uses a single index model approach to evaluate portfolio performance and a structured interview method. The study sample is companies listed on the IDXHIIDIV20 Index for the 2021 to 2023 period and investment manager as informants. These results prove that stock prices fluctuate in the same direction as the market index and each security has a different level of return and risk. Even though investors evaluate portfolio performance, excessive optimism, as a psychological factor, tends to control investor behavior in the investment decision making process. The research results support the behavioral financial theory that investors tend to act irrationally, because the decisions taken are not completely based on rational considerations but are also influenced by various kinds of biases that have an impact on investors' actions. However, investors' actions are seen as something normal. The results of the study contribute to the financial field to drive the efficiency of resource allocation and provide signals that reflect the value of the company.

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INTRODUCTION

Investor behavior is related to investors' efforts to create value from several assets they own by considering the rate of return and risk. Shares are a risky asset because they have a relatively high level of uncertainty. The expected rate of return and the risk of an investment are in the same direction (Bannier et al., 2023; Huda & Sihombing, 2022; Shivaprasad et al., 2022). When investors expect a high level of return, they will also be faced with a high level of risk, and vice versa.

Investors assume that the rate of return and risk of an investment can be predicted. Rational investors will act to maximize the level of expected return at a certain level of risk that they can accept. For this reason, investors have an interest in evaluating the performance of their assets, one of which is through forming an optimal portfolio. Through the process of forming an investment portfolio, the level of return and risk of each portfolio will be reviewed, so that it will help investors allocate several of their assets into various types of investments to achieve optimal profits. This study aims to answer the problem formulation regarding how investors behave in making investment decisions related to portfolio performance evaluation.

Empirical facts show that successful investors are individuals who can balance the expected rate of return and risk. Financial theory explains that every investment contains risks which are one of the considerations in decision making, while investors' analytical skills are relatively limited, so these limitations can affect the quality of investment decisions (Alviniussen & Jankensgrd, 2018). In general, most investors don't like risk and want to avoid it as early as possible. Rational investors will prefer the optimal portfolio. However, investors cannot behave only by relying on their choice on the expected level of return. In this condition, apart from knowledge and the ability to analyze the information received, the investor's experience as a market participant is also needed, as well as his ability to control factors psychology so as not to be biased in making investment decisions. The psychological factor in question is the possibility that investment decision making by investors influences cognitive and emotional factors. Financial behavioral theory explains the individual side of decision making, that when investors involve psychological factors, it tends to cause them to behave irrationally (Almansour et al., 2023; Fathmaningrum & Utami, 2022; Mahapatra & Mishra, 2020; Sudirman et al., 2023).

Evaluation of portfolio performance through optimal portfolio formation requires an assumption related to investor behavior in making investment decisions, that investors tend to behave in maintaining safe conditions to avoid high risks. This behavior illustrates the rational nature of investors, namely individuals who, if presented with two investment options with the same expected rate of return at different levels of risk, will tend to choose the investment at the lower risk level (Balqis et al., 2021; Huda & Sihombing, 2022). However, several empirical studies show that investors often act irrationally, which is contrary to financial theory. These actions show a tendency to bias cognitively, emotionally, and socially.

Investment theory explains that portfolio performance can be measured based on the level of risk, because there is a trade-off between return and risk (Bannier et al., 2023; Shivaprasad et al., 2022). The profits obtained by investors are compensation for the risks borne by the investor. Portfolio performance evaluation is the final stage of the investment management process which aims to assess whether the portfolio that has been formed has good performance and is in line with investment objectives. The results of this evaluation will form an optimal portfolio model. There are several models that can be used to form an optimal portfolio, including the single index model, the Markowitz model, and the capital asset pricing model. This study will use a single index model in forming an optimal portfolio. The single index model or also called the Sharpe measurement model is useful for investors for optimal portfolio formation by estimating the expected rate of return and portfolio risk level, as well as focusing on calculating the rate of return of each asset against the rate of return of the market index. This measurement model simplifies the calculation of portfolio formation from the Markowitz model which involves many variances and covariance, so it is considered relatively complicated.

Portfolio performance evaluation is one of the rational activities of investors. The aim is to assess the portfolio that has been formed as having good performance and in accordance with investment objectives. The collection of assets in an investment portfolio is expected to produce a rate of return, both in the short and long term. Portfolio formation is intended to reduce investment risk by diversifying. A portfolio is a collection of various assets owned by investors with the aim of

reducing risk through diversifying asset ownership. The return from a portfolio is the weighted average of all the total returns of the stocks that make up the portfolio. On the other hand, portfolio risk contains unique characteristics and is not just the total combined risk of individual stocks. The single index model or Sharpe model is a calculation that measures the total risk level. This model states that stock returns fluctuate in the same direction as the market index. Individual stock prices tend to increase if the market price index increases, and vice versa. This model also explains the relationship between the returns on each individual security and market returns (Faisal et al., 2023; Sudarsano, 2022; Wyanov & Gandakusuma, 2023).

Behavioral financial theory studies how to understand the actions of individuals (investors) in the investment decision making process. Decision making is a process of selecting available alternatives under various situational influences. Investment decisions are the process of investing with the expectation of future income. Investment decision making in the capital market can be influenced by knowledge and analytical skills, both fundamental and technical, as well as investor psychology. The development of behavioral financial theory was driven by market players who tended to oppose market movements and act speculatively. As a result of this behavior, quite a few investors suffered losses, even very large amounts. This condition illustrates that individuals tend to act irrationally, whether done systematically or counterproductively. This is of course different from financial theory, which states that investors are rational individuals, because they have sufficient and reliable information, so they can act consistently in making investment decisions (Almansour et al., 2023; Amin & Pirzada, 2014; Brown, 2020; Hidayat & Hartono, 2022; Prosad et al., 2015; Ratnawati, 2024; Song & Valencia, 2024; Sudirman et al., 2023; Yuliani et al., 2024).

The capital market describes the allocation of forums for investors in carrying out stock transactions with the aim of obtaining a rate of return from the transaction. Considerations in deciding on optimal shares require accurate data that reflects estimates of future share prices. Another factor that contributes to the level of investor confidence and perception of the fairness of security prices is if the prices can reflect all relevant information and avoid information that could mislead and harm investors (Almansour et al., 2023; Amin & Pirzada, 2014). In contrast to financial theory, behavioral financial theory assumes that investors are treated as normal and not rational, investors are seen as individuals who have limited self-control, and investors tend to be influenced by their own biases and are allowed to make cognitive errors that can result in wrong decisions. For this reason, apart from knowledge about stock investment, psychological factors also need to be understood and considered in the investment decision making process.

Psychological perspective states that there are at least two factors that can influence investors in making investment decisions, namely cognitive and emotional bias. Cognitive bias describes deviations in the process of understanding, processing and/or drawing conclusions about information or facts. Emotional bias describes deviations in the decision-making process due to ignoring information or facts and prioritizing feelings and impulsive attitudes which can make investors lose control of their rationality, for example because investors are overconfident. Emotional distortion leads to decision making based on momentary emotions or emotional distress, such as anger, anxiety, joy, pleasure, and fear. Often emotions are the reason why individuals make irrational decisions (Almansour et al., 2023; Mahapatra & Mishra, 2020; Ratnawati, 2024; Rodriguez et al., 2024; Saputra, 2024).

Investment decision making is also influenced by efficient market conditions. For investors, an efficient market means being able to obtain information freely and evenly, where no one, whether individual or institutional investors, will be able to obtain abnormal returns over a long period of time using existing trading strategies. Market efficiency is also associated with the sophistication of market players in making decisions based on available information, referred to as decisionally efficient market (Brown, 2020; Yildirim, 2017). The efficient market hypothesis is one

of the most influential modern financial theories, with the assumption that all relevant information is reflected in the price of security when security is traded. The concept of the efficient market hypothesis states that at certain times in highly volatile markets, stock prices are valued efficiently to reflect all available information. This concept is based on the belief that market players view stock prices rationally based on all factors, both intrinsic and extrinsic, now and in the future. However, when studying the stock market, behavioral finance saw that the market was not completely efficient. This makes it possible to observe psychological factors in the investment decision making process (Fathin & Hersugondo, 2022; Kamoune et al., 2022; Nareswari et al., 2023).

RESEARCH METHOD

To find out and analyze investor behavior in making investment decisions based on portfolio performance evaluation, it is carried out in two stages. First, form an optimal portfolio from the High Dividend 20 Index (IDXHIDIV20) listed on the Indonesia Stock Exchange for the 2021 to 2023 period using a single index model approach. The aim is to obtain empirical evidence that the stock price index fluctuates in the same direction as the market price index, where each security has a different level of return and risk in each period, so analysis is needed to determine portfolio performance. The use of a single index model in this research is also a continuation of several previous studies which aimed to answer the problem of investment uncertainty. The difference lies in the observation period, market index object, and the model used to form the optimal portfolio, namely IDXHIDIV20.

The population in this study are companies participating in IDXHIDIV20 with a total of 20 companies in the 2021 to 2023 period. Next, sample selection uses a purposive sampling technique, namely selecting samples based on certain criteria or special selection. Weekly stock price data is used for analysis and assessing portfolio optimization. Determination of the total observation data is presented in Table 1.

Second, conducting structured interviews with four investment managers registered with the financial services authority (OJK) as selected informants regarding their activities in managing and evaluating portfolio performance. The underlying assumption is that investor behavior is reflected in activities that can be observed by other individuals based on the motivation and suggestions of other parties to increase their wealth in the future. The aim is to provide empirical evidence whether investor behavior in making investment decisions is based on the results of portfolio performance evaluation. Data analysis was carried out using an exploratory design. The informants' data is presented in Table 2.

Table 1. Determination of the total observation data

Description	Total
Companies listed in the IDXHIDIV20 Index period 2021 to 2023	20
Companies that do not get a positive net profit and do not increase over the last three years	(12)
Companies that do not distribute cash dividends regulary	(2)
Number of companies selected as sample	6 Companies
Number of years of observation	3 Years
Total observation data	18 Samples

Table 2. The informants' data

Initials	Location
AS	Surabaya
DH	Surabaya
RS	Surabaya
YS	Surabaya

RESULTS AND DISCUSSIONS

Portfolio Performance Evaluation

Evaluation of portfolio performance through the formation of an optimal portfolio using a single index model approach is carried out through several stages sequentially as follows: calculating stock and market returns, calculating expected stock and market returns, calculating stock and market risk, calculating beta and alpha, determining the cutoff point (C^*), determine the optimal portfolio candidate with the criteria if $ERB > C^*$, calculate the proportion of shares (W_i), and calculate the expected return and variance which can then be used to measure portfolio risk (Faisal et al., 2023). The results of the portfolio performance evaluation are presented in table 3.

The portfolio performance evaluation results show a cutoff point (C^*) value of 0.006. The calculation of the excess return to beta ratio (ERB) value for shares is negative, except for HMSP, even the market ERB is also negative. If we look at the calculation of the C^* value, which is the dividing point between stocks with high ERB and stocks with low ERB, only HMSP shares are in the optimal portfolio category. There is only 1 share above C^* (0.006), namely HMSP. HMSP with an ERB of 0.543, which means $0.543 > 0.006$, is included in the optimal portfolio. Thus, the results of portfolio performance evaluation on shares classified as IDXHIDIV20 for the 2020 to 2022 period using a single index model approach were only able to produce one optimal share, namely HMSP. However, if we examine in depth, these six shares are among the categories of shares that are of interest to investors. The optimal portfolio formation shows an expected portfolio return value of 0.01 or 1% and a portfolio risk value of 0.05 or 5%.

Table 3. The results of the portfolio performance evaluation

Stock Code	Return	Expected Return	Risk (%)	Beta	Alpha	C^*	ERB	W_i	Variance
BBCA	0.002	0.002	4.82	0.152	0.002	0.001	-0.367	0.010	0.05
BBNI	0.001	0.001	3.85	0.452	0.001	0.006	-0.123	0.007	0.03
BBRI	0.005	0.005	3.30	0.125	0.004	0.002	-0.445	0.006	0.03
BJTM	0.001	0.001	2.44	0.188	-6.172	0.004	-0.298	0.005	0.02
BMRI	0.002	0.002	3.79	0.042	0.002	0.001	-1.339	0.008	0.04
HMSP	-0.006	-0.006	3.97	-0.102	-0.006	-0.001	0.543	0.008	0.04
IDXHIDIV20	0.001	0.001	2.44	1	0	0.023	-0.055	0.043	0.01
Expected Return Portfolio			0.01	1%					
Risiko Portfolio			0.05	5%					

Noted: the optimal share is HMSP

Investor Behavior and Investment Decisions

The investment objective is to obtain optimal expected returns at the lowest level of risk. For this reason, in the decision-making process, investors need to evaluate the performance of their portfolio by analyzing the expected level of return and the level of risk they will face from their investment activities. The ability to analyze portfolio performance evaluation results depends on the investor's financial knowledge and investment experience. More than that, empirical evidence reveals that there are other factors that need to be considered in the investment decision making process, namely psychological factors. Based on a behavioral financial perspective, after receiving information, there are two factors that influence investors in making investment decisions, namely cognitive and emotional factors. Where these two factors tend to experience bias or deviation, it is also necessary to be able to control investors' psychological factors so that they are not biased in making investment decisions.

The results of this study reveal that investor behavior in the investment decision making process tends to be irrational. The existence of cognitive biases causes the process of understanding, processing, and drawing conclusions about information to tend to experience systematic errors and deviations in the process. One of these biases can be seen from the behavior of investors who tend not to pay attention to the intrinsic value of shares when price movements occur, both increases and decreases in share prices. Apart from that, there is an emotional bias, investors tend to prioritize feelings and impulsive attitudes compared to the facts they receive. This bias is reflected in the behavior of investors who are too confident and tend to ignore the facts they receive. The following are the results of interview excerpts that reveal these two biases in the decision-making process and the tendency to ignore the results of portfolio performance evaluations.

The following is an excerpt from an interview with informant A: " Investment portfolio evaluation needs to be carried out by every investor, especially novice investors. Knowing which portfolio is performing well can minimize risk and maximize potential profits to be obtained. Investment decision making is not based on the results of portfolio performance evaluations, but often the results of these evaluations are not analyzed in depth due to overconfidence bias. Someone who feels they are smart and intelligent tends to value themselves higher than other people. In addition, people who call themselves 'experts' in a particular field often exaggerate their own abilities or performance compared to the abilities or average performance of other people. The result of overly high self-confidence causes these smart people to ignore facts that are not revealed, or that are deliberately covered up by certain parties to gain profit. Investors who are too confident tend to easily fall into biased decision making." (AS)

This statement implies that investors have processed the information they received and evaluated the performance of their portfolio. However, evaluation results are often not analyzed in more depth because of excessive self-confidence. This means that when the evaluation results show positive values (good news), he does not analyze in depth what is behind the positive results, the same applies when negative results are obtained (bad news). As a result, the facts implied by the evaluation results are ignored and investors tend to be controlled by emotional bias.

The following is an excerpt from an interview with informant B: " In my opinion, investors need to evaluate their investment portfolio, to optimize the funds invested, and to find out to what extent investment targets and objectives can be achieved. I understand that by analyzing portfolio performance, it will help in making decisions to determine the efficient portfolio combination, level of profit and level of risk of the portfolio formed. However, investment decisions are often biased because they are influenced by psychological factors. Broadly speaking, bias in investing comes from two sources: cognitive and emotional. Cognitive bias can come from statistical figures, or stored data, while emotional bias arises from actions based on feelings, not facts or careful calculations. Emotional bias often triggers feelings of discomfort when the results obtained are the opposite to expectations, which can lead to attribution bias, namely a condition where an investor tends to blame external conditions when he experiences a loss, but when he succeeds, he considers this to be solely the result of his abilities. himself in managing investments." (DH)

This statement implies that the investment decision making process tends to be controlled by psychological factors. His ability to process information and analyze financial figures triggers excessive self-confidence so that decisions taken tend to be based on emotions and ignore facts because of fundamental analysis.

The following is an excerpt from an interview with informant C: " Rational investors will choose a portfolio that performs well, which is formed by optimizing expected return and risk. Investor behavior is normal and rational, meaning that investment decisions are taken with rational considerations, fundamental analysis is carried out first, form an optimal portfolio composition, and analysis of portfolio performance. However, often the decisions taken are also

influenced by emotions, people tend to believe more in their 'heart', this is what triggers bias. One of the causes of bias in investment decision making is the fear of loss (loss aversion). Investors may immediately sell their shares because they are worried that the price will continue to decline, even though fundamentally, the issuer of the shares being sold is in a healthy condition. The desire to reduce losses (cut losses) seems reasonable, but if examined more deeply, the potential for share price increases could be much greater if investors are willing to wait patiently for the momentum of rising prices. This fear of losing can also give rise to a disposition effect bias, where an investor holds his shares longer even though the share price has experienced a sharp decline. Without realizing the losses, investors still hope that the prices of these shares will increase again, even though the economy is predicted to be gloomy for some time to come." (RS)

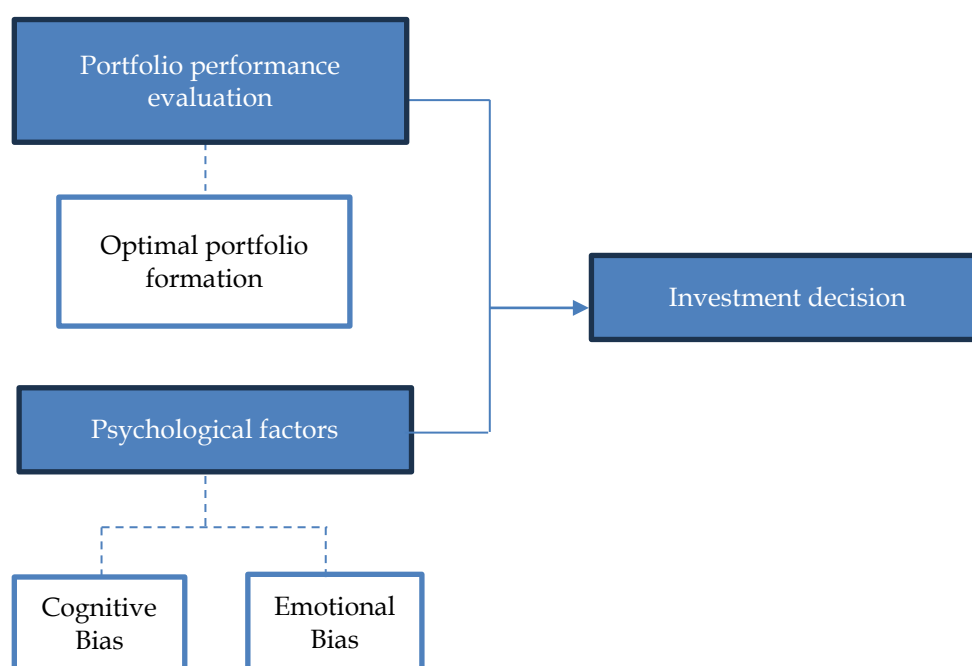
This statement implies that in the process of making investment decisions, rational investors also tend to behave by prioritizing psychological factors, both cognitive and emotional biases. Excessive fear of loss and too high expectations tend to control investor behavior. This tendency is contrary to the investment credo that cut loss measures are often necessary to save an investment portfolio. So, even though they behave rationally, investors also consider psychological factors in the hope of maximizing the utility they obtain.

The following is an excerpt from an interview with Informant D: "Portfolio evaluation is a stage that investors need to carry out to find out whether the portfolio they have formed has produced good performance. Evaluating portfolio performance is the same as measuring the work results of the portfolio formed. Through portfolio evaluation, the investment risk profile can also be known, in the hope of reducing bias in investment decisions taken. Bias can arise as a result of using wrong information, for example representation bias. This bias occurs when investors predict future investment performance based on current performance. When share prices rise, a decision to buy is made in the hope that the increase will continue. When the share price falls, a decision to sell is made even though the share price does not match its intrinsic value. Stocks are said to be cheap if their price is below their intrinsic value. This bias usually arises because of investors basing their decisions on experience, or being too quick to assess current results, such as announcements about increases in current company earnings that are assumed to also occur in the future. In principle, investment activities include the process of buying and/or selling assets (shares). A great liking for certain assets causes investors to tend to buy them more than sell them. This bias is referred to as attention bias. If investors like a certain type or classification of shares, they usually tend to buy more shares of that type than sell them." (YS)

This statement implies that the process of making investment decisions, whether buying and/or selling shares, carried out by investors often involves complex screening and limited information, so that investors face many problems in carrying out their investment activities. Looking at the various biases expressed by informants, investment activities will never be free from emotional factors which have an impact on not carrying out in-depth analysis of the information they receive. What investors need to realize is that limited information and personal abilities in carrying out investment activities need to be scrutinized and studied periodically to reduce the impact of bias in making investment decisions.

Based on the overall interview results, it can be concluded that rational investors in the decision-making process tend to be objective, think logically, identify, and analyze information received to achieve a goal, make it possible to obtain various alternatives and evaluate various investment alternatives before deciding to optimize utility. However, this rational thinking cannot be fully applied to practical situations because the facts show that investors are not always in a rational condition. In this condition, investors tend to use a behavioral approach (psychological factors). There are habits, traits and characteristics that need to be considered before deciding. It is hoped that the decisions made will be adjusted to the habits of the individuals affected by the decision. Decisions made now will certainly apply to the future. Because it cannot be predicted

with a high degree of accuracy, the decisions made must be able to accommodate uncertain market situations. The adjustment process is needed as a balance to rational decisions. Thus, decision making by considering psychological factors, even though it appears irrational, is considered reasonable (normal) and is very calculated to obtain solutions to things that cannot be defined using rationality. The results of this study are presented in a model (figure 1) which describes investor behavior in making investment decisions based on evaluating portfolio performance and psychological factors.



Source: analysis results

Figure 1. Investor behavior in making investment decisions.

CONCLUSION

Based on the results of the study, it can be concluded that evaluating portfolio performance through portfolio optimization needs to be done so that investors get a certain return with the smallest risk. It has been proven that with a single index model approach it is possible to identify which shares are included in the optimal portfolio. Rational investors tend to consider the results of portfolio performance evaluation. However, investors' rational behavior cannot be fully implemented. Because investors face uncertain market conditions and excessive optimism, there are other factors that tend to control investor behavior more, namely psychological factors. The results of this study provide support for behavioral finance theory.

In connection with investor behavior in making investment decisions, an in-depth analysis of the information they receive is required. Habits and experiences to overcome psychological biases also need to be considered. To overcome psychological bias, the following can be done: analyze information comprehensively and objectively, identify risk profiles and risk tolerance levels, readjust portfolio allocations according to investment objectives, create and implement investment plans so that investors can refrain from acting irrationally and tend to be biased.

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