

The Dollar Cost Averaging, Lump Sum and Value Averaging Strategies in Mutual Fund Investments

Muhammad Miftahudin Zein* & Gede Sri Darma

Universitas Pendidikan Nasional, Jl. Bedugul No.39, Sidakarya, Denpasar Selatan, Kota Denpasar, 80224, Indonesia

Abstract

Investment strategy and portfolio management are crucial considerations when investing in mutual funds. This research aims to analyze the effectiveness of achieving optimal returns by simulating dollar cost averaging, lump sum, and value averaging approaches. This analysis is conducted about the performance of a mutual fund portfolio, utilizing the Sharpe and Treynor methods. The research sample employs a purposive sampling technique, selecting the top 5 mutual funds in terms of performance, managed by different investment managers in the year 2022. Simulations are being conducted over three specific periods. In addition to mutual funds, a comparative analysis was conducted involving the Jakarta Composite Index (JCI) and 10-year government bond yields (SUN). The simulation results on equity funds for the three periods indicate that the Lump Sum investment method outperforms dollar cost averaging and value averaging, particularly over 6 years. This finding is further corroborated by the Kruskal-Wallis test, which highlights a significant variance in return performance. The results of the Sharpe and Treynor investment methods exhibit significant differences, as confirmed by the Mann-Whitney test. Lastly, regarding benchmark comparisons, the performance of equity funds surpasses that of the benchmark.

Keywords: mutual fund, investment DCA, lump sum, value averaging.

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1. Introduction

Investors in the investment process generally begin with an understanding of investment objectives and then frame investment strategy policies as stated by Gupta (2015) Mutual fund investment strategies related to dollar cost averaging, lump sum & value averaging, it is recommended by experts such as (Brennan, Li, and Torous 2005; Constantinides 1979; Knight and Mandell 1992; Rozeff 1994) with their respective views regarding this strategy. Investment Strategies in Mutual Funds can broadly be classified into lump sum and SIP. SIP or Systematic Investment Plan also called Dollar cost averaging (DCA) Chodietty et al. (2022) Another strategy was put forward by (David et al. 2019; Patel and Shinde 2020) Mutual fund investment with Value averaging is a mutual fund investment scheme by buying a certain number of units each period to get certain mutual fund units. This research will detail the approach related to 3 investment strategies: dollar cost averaging, lump sum, and value averaging.

Mutual Funds are investment instruments whose funds are collected collectively and professionally managed by investment managers for certain asset allocations in the Capital Market. (Cagnazzo 2022; David et al. 2019; Hadi et al. 2022; Kusuma and Kumar 2022; Palraj and Krishnamoorthy 2022) In addition, Mutual funds are a type of investment that is suitable for beginners or young investors. Hadi Putra et al. (2022) Investment is buying assets whose value is expected to increase over time and provide returns for Investors Based on KSEI data on November 3, 2022, the number of mutual fund investors referring to the Single Investor Identification (SID) has reached 10,000,628, with a composition of 99.78% local investors.

The dollar cost-averaging investment strategy is one of the strategies recommended by experts such as Milevsky and Posner (2003) and Statman (1995) in terms of research novelty, this dollar cost-averaging strategy is supported by researchers (Chodietty et al. 2022; Choe and Ban 2020; David et al. 2019; Kirkby, et al. 2020; Lu et al. 2021; Patel and Shinde 2020; Phuensane et al. 2022) Dollar cost averaging strategy is an investment strategy which invests a fixed amount of money periodically with the same nominal. Lu et al. (2021) With the benefits of the DCA strategy, investors can invest in small amounts and develop a sense of discipline. Investors don't need to worry too much about market

* Corresponding author.

E-mail address: zeinmiftahudin@gmail.com

fluctuations. when the market is rising or falling consistently with the same investment, this strategy can be used to avoid emotional and irrational investment behavior. (Patel and Shinde 2020)

The lump sum investment strategy is one of the investment strategies which is also supported by previous experts (Knight and Mandell 1992; Rozeff 1994; Thorley 1995; Williams and Bacon 1993) and from a novelty point of view this research is also recommended (Choudhari and Borgaon 2020; Eriksson and Fransson 2021; Gajera et al. 2021; Merlone and Pilotto 2014; Panyagometh and Zhu 2016). A lump sum investment is an investment in a sizable amount in a mutual fund scheme, generally made for the long term to increase the chance of a higher return. According to Choudhari and Borgaon (2020) one of the advantages of implementing a lump sum strategy is that there is not too much investor involvement, only 1 investment, and waiting for results at a later date. (Chodietty et al. 2022)

The value-averaging investment strategy is also a strategy for investing in mutual funds which were discovered by Edleson (1988) with an update in 2006, and recommended by previous research (Chopade 2013; Dhar and Banerjee 2021; Huang and Dai 2018) The definition of a value averaging strategy is an investment strategy in which at the beginning investors have determined their monthly/quarterly investment targets to achieve the desired investment targets in the future. The idea of this investment is that when the market goes down, more investment is allocated, while when the market goes up, the nominal value invested is lower (Edleson 1988)

Measuring Mutual Fund Performance by comparing it to benchmarks is a common thing to do, for example (Cremers et al. 2022; Lehman N. Bruce. and David M. Modest. 1987; Sensoy 2009) One of the factors to pay attention to in mutual fund investment in Indonesia, especially stock-based mutual funds stocks, namely the JCI Pratama (2018) As a comparison of mutual funds, especially equity funds, namely the benchmark Composite Stock Price Index, along with the performance of the last 10 years

According to previous research studies regarding mutual fund investment strategies, namely dollar cost averaging, lump sum, and value averaging, the findings were different, as stated by (Chodietty et al. 2022; David et al. 2019; Gupta 2015; Kirkby et al. 2020; Lu et al. 2021; Mishra and Rout 2022; Patel and Shinde 2020) concluded in their research that the dollar cost averaging strategy or its synonym, namely the systematic investment plan, is better applied by investors than the value averaging strategy and the lump sum strategy. However, in other studies, the lump sum strategy was chosen and is better applied compared to dollar cost averaging and value averaging as research (Choudhari and Borgaon 2020; Gajera et al. 2021; Phuensane et al. 2022) and also supports value averaging as an investment alternative is also the best by Cremers et al. (2022); Sensoy (2009)

Previous research has examined the views on investment strategies in mutual funds, but to the author's knowledge in Indonesia there have not been many studies with these strategies, therefore the author has an interest in researching dollar cost averaging, lump sum, and value averaging strategy simulations in investing in In addition to mutual funds, researchers will add the performance results of mutual funds using the Sharpe & Treynor method as well as a comparison of the performance results against the benchmark.

2. Literature Review

2.1. Mutual Fund Investment Theory

Investment is an investment decision that always includes the sacrifice of current benefits for better future returns. Investments are always made with certain specific goals. Gupta (2015) Mutual funds are investment trusts that combine investor capital and are invested in capital market assets in a diversified manner by investment managers Kusuma and Kumar (2022) There are four types of mutual fund products to choose from: stocks, money market, bonds, and balanced funds Hadi Putra et al. (2022) Mutual funds according to the capital market law Undang-Undang Pasar Modal (1995) mutual funds are a vehicle for raising funds from the investing community which is then reinvested into securities portfolios by the Investment Manager. Mutual funds are a product of a company that is included in the capital market category which is supervised by the OJK so that they can carry out fundraising activities for the public Rudiyanto (2019) The performance of mutual funds is influenced by the performance of the stock market, bond market, and of course the economy as a whole. Kusuma and Kumar (2022) NAV is used as a divisor to determine the number of units of participation when purchasing a mutual fund and is used as a tool to measure investment performance in mutual fund management. This NAV is usually used as a benchmark in mutual fund performance for the amount of return earned on investment (Hermawan and Wiagustini 2016)

Types of Mutual Funds can be interpreted by as a variety of investment management products in Indonesia for mutual funds there are at least 4 that are generally known, namely: Money Market Mutual Funds with an allocation of 100%

market instruments, Fixed Income Mutual Funds with a minimum of 80 % Bond/Debt Instruments, Equity Mutual Funds with a minimum of 20% equity and mixed mutual funds with a 1-79% policy on stock, bond, and money market instruments. Composite Stock Price Index (IHSG) According to Tandililin (2017) JCI or the abbreviation of the Composite Stock Price Index is an index that uses all listed shares as a component of price index calculations. This index describes price movements of ordinary shares and preference shares, one reflection of the state of the Indonesian economy.

2.2. The Investment Method

The investment method is the result of information processed by available investors, dollar cost averaging and Lump sum are two strategies with different characteristics in the role of investment strategy in the capital market. Eriksson and Fransson (2021).

2.3. The Dollar Cost Averaging

The Dollar Cost Averaging strategy is an alternative that is recommended by investment professionals to be applied to investors and is supported by previous researchers such as (Chodietty et al. 2022; David et al. 2019; Gupta 2015; Kirkby et al. 2020; Lu et al. 2021; Mishra and Rout 2022; Patel and Shinde 2020) The use of DCA can avoid investment or saving behavior that is emotional or irrational. The dollar cost averaging strategy is an investment strategy that invests a fixed amount of money periodically for a certain time interval with the same nominal installments, regardless of market ups and downs when purchasing mutual funds, This method avoids the risks and adverse effects of market falls when investors place their funds at once or a lump sum. In addition, the DCA method can avoid emotional or irrational investing or saving behavior and with DCA saving little by little in the long term will be a large amount, This method is often used in investment selection, especially for managing funds for retirement needs as stated by Lu et al. (2021) this method is also commonly used by investors who are designated for their retirement, which is for long-term investments. (Eriksson and Fransson 2021)

2.4. Lump Sum Strategy

A lump sum strategy is a method of investing the entire amount at once, not in regular installments. usually carried out by large investors and experienced investors as stated by Patel and Shinde (2020) A lump sum refers to a sizable investment in a Mutual Fund scheme. In a lump sum investment, the money is kept as a one-time down payment. Individuals with large sums can hold a significant proportion of them in Mutual Funds. Lump sums are generally done for the long term which increases the chances of getting higher capital gains. Usually, lump sum investments are made by big players and investors, in stocks especially those related to assets that tend to be recognized in the long term, making the investment profitable except in cases of high volatility, in times of rising market trends, lump sums excel because it is invested largely and directly thereby reaping the benefits of market growth. Eriksson and Fransson (2021) Lump sum investment is highly favored by most investors, as there are fewer variables involved and returns are generally on the higher side Lu et al. (2021)

2.5. Value Averaging Strategy

Value averaging strategy is an investment scheme similar to Dollar cost averaging but the amount invested each month is flexible within predetermined limits. If the mutual fund performance is better than the expected value in the previous month, the amount invested in the following month is lower and if the fund performance is worse than the expected value, the amount invested in the following month is higher, as stated by Patel and Shinde (2020)

2.6. Evaluation of Portfolio

Evaluation of Portfolio Performance According to Husnan (2018) Evaluation of portfolio performance is an important step in portfolio management to ensure that the investment achieves the desired objectives. Some of these aspects are performance measurements such as return on investment, volatility, risk and return ratios, and other aspects, namely comparison with benchmarks, namely comparing portfolio performance with relevant benchmarks such as market indexes. the importance of monitoring and evaluating recommended portfolio rebalancing for investors.

Evaluation of a mutual fund is one of the important things that must be considered, especially when choosing a mutual fund for investment, by evaluating the performance of mutual funds we can calculate the potential benefits and risks that may be obtained in investing. One of the methods used is the Sharpe and Treynor method. Rudiyanto (2019) before getting the results of the Sharpe and Treynor methods, the following data must be calculated first:

Return of Equity Mutual Funds, in investing a return of equity funds within a certain period will show a measure of the performance achieved by the company which is calculated from the NAV data per unit. Mutual fund returns can be calculated using the following formula: (Jogiyanto 2015)

$$Rp = \frac{NABt - NABt-1}{NABt-1} \quad (1)$$

Rp = Return of Equity Mutual Fund period t

$NABt$ = NAV of Mutual Funds at the end of the period

$NABt-1$ = NAV of Equity Mutual Funds at the beginning of the period

Market Return (R_m), stock mutual funds to get results that can be measured by their current performance, a comparison is needed, namely the JCI. Pratama (2018) asset returns can only be influenced by a market index return Jogiyanto (2015) shows a performance that has been achieved within a certain period calculated from the value of the JCI. Return on the JCI can be calculated in the following way:

$$Rm = \frac{IHSGt - IHSGt-1}{IHSGt-1} \quad (2)$$

Explanation:

Rm = Composite Stock Price Index return period t

$IHSGt$ = Current Composite Stock Price Index t

$IHSGt-1$ = Composite Stock Price Index in the previous period $t-1$

Average Risk-free Investment, in other terms the risk-free rate is the rate of return (return) obtained by investors from risk-free types of assets) Jogiyanto (2015) risk-free investment which is assumed to be the average interest rate on Certificates Bank Indonesia (SBI) in a certain period. Risk-free can be identified in the following way:

$$R_{RF} = \frac{\sum BI \text{ rate}}{n} \quad (3)$$

Explanation:

R_{RF} = Average risk-free investment

$\sum BI \text{ rate}$ = Total BI rate in a certain period

n = Number of calculation periods

The standard deviation describes deviations that occur from the average performance of equity funds generated in certain sub-periods. The standard deviation of mutual fund returns can be determined in the following way:

$$\sigma = \frac{\sqrt{\sum (x - \mu)^2}}{n-1} \quad (4)$$

Explanation:

- σ = Standard deviation

- x = Value of data within the sample

- μ = Mean

- n = Number of data

The Beta calculation involves the computation of beta for each equity mutual fund with the divisor. The beta calculation in this research employs the following formula:

$$\beta_p = \frac{\text{cov}(r_p, r_m)}{a_{2m}} \quad (5)$$

Explanation:

- β_p = beta or systematic risk of a portfolio
- $\text{cov}(r_p, r_m)$ = covariance between portfolio returns and market return
- a_{2m} = variance of the stock

2.7. The Sharpe Method

The Sharpe Method is a method discovered by Sharpe, which is an index commonly referred to as the reward-to-variability ratio. This method is a performance measurement technique for mutual funds that employ the capital market line as a benchmark, achieved by dividing the portfolio's risk premium by its standard deviation. The risk premium is the difference between the portfolio's average return and the average risk-free investment performance. Tandelilin (2017) The Calculation of Mutual Fund Performance using the Sharpe Method involves computing performance using with the following formula:

$$S_p = \frac{R_p - R_f}{\sigma_{TR}} \quad (6)$$

Explanation:

- S_p = Sharpe portfolio index
- R_p = Average return of portfolio p during the observation period
- R_f = Average risk-free rate during the observation period
- σ_{TR} = Standard deviation of portfolio p's return during the observation period

2.8. The Treynor Method

The Treynor Method is a portfolio performance measure developed by Treynor (1965) also known as the reward-to-volatility ratio. This method involves assessing portfolio performance by linking the portfolio's return rate with its risk level. In contrast to the Sharpe method, the key distinction lies in using the security market line as a reference point. The assumption is that the portfolio is well-diversified, making the relevant risk the systematic risk (measured by beta). A higher Treynor ratio indicates better mutual fund performance. Tandelilin (2017) Calculation of Mutual Fund Performance using the Treynor Method involves the following steps: The first step in calculating performance using the Treynor method is to calculate the beta of each equity mutual fund as the divisor. The calculation of beta in this research employs the following formula:

$$T_p = \frac{R_p - R_f}{\beta_p} \quad (7)$$

Explanation:

- T_p = Treynor portfolio index
- R_p = average return of portfolio p during the observation period
- R_f = average risk-free rate during the observation period
- β_p = portfolio beta

2.9. Dollar Cost Averaging Strategy in Mutual Fund Investment

According to Chodietty et al. (2022) their research conducted in India explored equity mutual fund investment involving four equity mutual fund products over a span of six years (2013-2018). The study assessed the performance of these funds and found that the dollar cost averaging strategy, referred to as the Systematic Investment Plan (SIP), yielded better results than lump sum investing. However, this strategy was associated with cost-related risks and required careful timing for switching to the money market during downturns. Patel and Shinde (2020) investigated three investment strategies: Systematic Investment Plan (SIP), Lump-Sum, and Value Averaging, applied to four mutual fund products over three years. The research indicated that the Systematic Investment (Dollar Cost Averaging)

strategy outperformed other strategies and generated 5-6% annual returns. Lu et al. (2021) conducted research in the US context, analyzing Lump Sum and Dollar cost-averaging strategies using the Sharpe ratio and economic performance measures. The findings favored the Dollar cost-averaging strategy over the Lump Sum. David et al. (2019) provided an overview of the systematic investment plan (DCA) and Lump Sum strategies in India, covering five mutual fund products. The results indicated the superiority of the DCA strategy, followed by Value Averaging, with Lump Sum generating the lowest returns.

2.10. Lump Sum Investment Strategy in Mutual Funds

According to Gajera et al. (2021) focusing on India, the study analyzed ten mutual funds managed by ten investment managers using T-Test and F-Test parameters. The research recommended using the Lump Sum strategy, especially suitable for criteria involving return and risk when employing only two strategies. Choudhari and Borgaon (2020) also in India, stated that the Lump Sum investment strategy was superior to the Systematic Investment Plan (Dollar Cost Averaging). The study covered ten mutual funds from 2014 to 2019 and employed the Compounded Annual Growth Rate (CAGR) for Lump Sum and the Extended Internal Rate of Return (XIRR) for the Systematic Investment Plan. Eriksson and Fransson (2021) originating from Sweden, analyzed 50 random mutual funds from 2000 to 2019 using the Holding Period Return (HPR), Sortino ratio, and Sharpe ratio. The findings suggested that Lump Sum Investment was superior in providing investment results from both a mean-variance and loss-averse perspective. Merlone and Pilotto (2014) declared in their research involving data from 30 international mutual funds using optimal control techniques that the Lump Sum investment method was better than the Systematic Investment Plan/Dollar Cost Averaging, primarily due to the limited burden of commission and transaction costs. The conclusions drawn from these studies indicate that the Lump Sum strategy is the most effective approach in mutual fund investment.

2.11. Value-Averaging Investment Strategy in Mutual Funds

According to Dhar and Banerjee (2021) their research focused on the concepts of Value Averaging and Rupee Cost Averaging, emphasizing the unit and top-up nominal aspects. Using quantitative analysis, the study examined the Axis Small Cap Fund from January 31 to December 31, 2019. The results indicated that Value Averaging outperformed Rupee Cost Averaging. Huang and Dai (2018) investigated the Taiwanese mutual fund market, analyzing Value Averaging and Dollar cost-averaging strategies applied to 100 mutual funds over 15 years (2002-2016). The research demonstrated that the Value Averaging investment strategy was more effective than the Dollar Cost Averaging strategy. Chopade (2013) provided insights into the superiority of the Value Averaging strategy over Dollar Cost Averaging in mutual fund investment. The simulation covered one mutual fund from May 2008 to May 2013, using the XIRR formula in MS Excel. The conclusions drawn from these studies assert that the Value Averaging strategy is the best approach in mutual fund investment.

2.12. Research Concept Framework

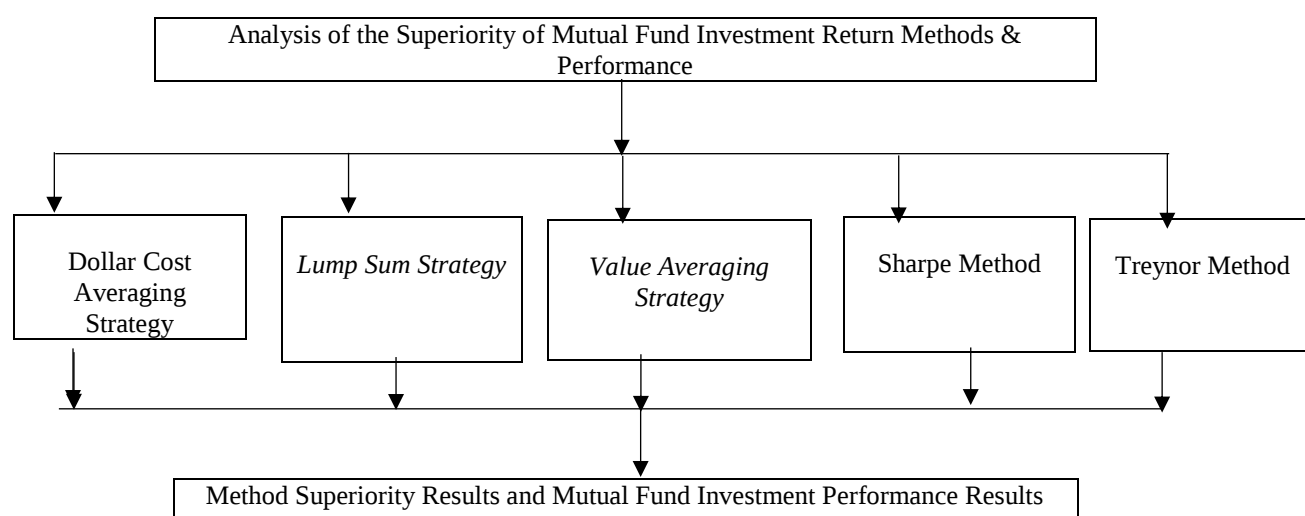


Figure 1. Research Concept Framework

Based on the theoretical review and the results of previous research, the research model can be described in figure 1. This research is a study with a hypothetical approach to Dollar Cost Averaging, Lump Sum & Value-Averaging Strategy form Investment methods and Sharpe & Treynor Method for Performance Result Mutual Fund.

2.13. Hypotheses in this research

- a) **H0:** There is no significant difference in the performance of Dollar Cost Averaging, Lump Sum, and Value Averaging investment strategies in mutual fund investment.
H1: There is a significant difference in the performance of Dollar Cost Averaging, Lump Sum, and Value Averaging investment strategies in mutual fund investment.
- b) **H0:** There is no significant difference in the portfolio performance evaluated using the Sharpe and Treynor methods for equity mutual funds.
H1: There is a significant difference in the portfolio performance of equity mutual funds evaluated using the Sharpe and Treynor methods.
- c) **H0:** $R_p > R_m$: The performance of equity mutual funds using return and risk has a value greater than or equal to the benchmark, which is the JCI (Benchmark).
H1: $R_p < R_m$: The performance of equity mutual funds using return and risk has a value less than the benchmark, which is the JCI (Benchmark).

3. Research Method and Materials

3.1. Population and Sample

This section will explain the research methodology employed in this study, aimed at conducting simulations and analyses of different mutual fund investment strategies (Dollar Cost Averaging, Lump Sum, and Value Averaging) on the five best mutual funds of 2022. These funds are managed by five different investment managers. Additionally, the research will involve calculating investment performance using the Sharpe and Treynor methods, as well as simulating and calculating the performance of the Indonesian Stock Exchange Composite Index (IHSG) with six years of historical data for comparison with the results of the mutual fund investments.

This research is considered an experimental study with the objective of assessing the effectiveness of three mutual fund investment strategies (Dollar Cost Averaging, Lump Sum, and Value Averaging) on the five best mutual funds of 2022, all of which have reached maturity and have been in operation for more than two years. The research will also encompass the calculation of IHSG performance. The data under examination will cover the years 2017-2022.

The study population comprises the six-year-old mutual funds of 2022, each managed by different investment managers, as awarded by Investor Magazine in partnership with Infovesta during the 21st Mutual Fund Award ceremony, as presented on the website Investor Daily (2022). These five equity mutual funds will be selected as the research samples. The primary variable in this research is investment performance, which will be measured using the Sharpe and Treynor methods.

Data regarding the five best equity mutual funds of 2022 will be obtained from reliable sources, such as the Investor.id website, which presents the list of mutual fund winners of the 2022 Best Mutual Fund Award. Additionally, data on the IHSG will be collected to compare the performance of the equity mutual funds. You can find the collected data in the following link:

(<https://docs.google.com/spreadsheets/d/1u2p1ttlvyDyLkgwX0jPAY2NZ1LleQmT/edit?usp=sharing&ouid=113842697447849088107&rtfpof=true&sd=true>).

This methodology provides a comprehensive framework for conducting simulations and analyzing the performance of equity mutual fund investments under various strategies. The inclusion of IHSG data allows for a meaningful comparison between the mutual funds and the broader market performance.

3.2. Measurement

3.2.1. Data Analysis for Investment Method Strategies

This analysis involves simulating and back testing Dollar Cost Averaging, Lump Sum, and Value Averaging investment strategies. The initial step includes collecting daily mutual fund Net Asset Value (NAV) data and daily stock market index (IHSG) data for processing and conducting simulations based on each strategy. The outcome of this process will yield preliminary conclusions drawn from the simulations.

For the Dollar Cost Averaging simulation, the data for analysis consists of daily NAV prices of five mutual funds from January 2017 to December 2022. The study will have three simulation periods: 1, 3, and 6 years, with specific details as follows:

- Period 1: January 2017 to December 2017
- Period 2: January 2017 to December 2019
- Period 3: January 2017 to December 2022

In this simulation, a monthly subscription of Rp. 1,000,000 will be made, resulting in a total yearly investment of Rp. 12,000,000. At the end of each period, the investments will be sold or redeemed for analysis.

For the Lump Sum simulation, the researcher will utilize three investment periods with an annual investment amount of Rp. 12,000,000 each. The periods are as follows:

- Period 1: January 2017 to December 2017, with an investment of Rp. 12,000,000
- Period 2: January 2017 to December 2019, with an investment of Rp. 36,000,000
- Period 3: January 2017 to December 2022, with an investment of Rp. 60,000,000

In this strategy, the initial investment is made at the beginning of each investment period on trading days.

For the Value Averaging simulation, there will be slight differences compared to Dollar Cost Averaging in terms of allocating funds each month. This method will target specific nominal values or percentages at the end of the investment period. For this study, it is assumed that the nominal investment amount will be the same as the two aforementioned strategies: Rp. 12,000,000, Rp. 36,000,000, and Rp. 60,000,000. The application periods will remain consistent: 1 year for period 1, 3 years for period 2, and 6 years for period 3.

3.2.2. Analysis of Mutual Fund Performance Data

This analysis comprises the following steps:

- a) Data collection, similar to the aforementioned steps, involving mutual fund NAV prices, daily IHSG performance, and the average Bank Indonesia interest rate.
- b) Calculation of the average NAV value for each mutual fund per year based on the NAV prices.
- c) Calculation of mutual fund returns using available formulas.
- d) Calculation of IHSG market returns using available formulas.
- e) Determination of the average risk-free investment rate.
- f) Prior to the final stages, the standard deviation and Beta will be calculated for each data set. This data will be used to assess the performance of each mutual fund using the Sharpe and Treynor methods.

3.2.3. Statistical Testing

In this study will commence with normality tests to examine whether the selected data meets the criteria of a normal distribution or is non-normally distributed. Subsequently, parametric statistical methods such as the Independent T-Test for comparing two variables (assuming normal distribution) will be applied. If the assumptions are not met, the Mann-Whitney test will be used instead of the Independent T-Test for two-variable comparisons. For more than three variables, One-Way ANOVA will be used to assess differences between groups based on the mean of the dependent variable. If the assumptions of One-Way ANOVA are not met, Kruskal-Wallis's test will serve as a non-parametric alternative.

The results of the tests will be determined based on the probability value (p-value):

- If the p-value < 0.05, there is a significant difference between the portfolio performance measurement methods.
- If the p-value > 0.05, there is no significant difference among the three portfolio performance measurement methods.

4. Results and Discussion

4.1. Result Data Analysis for Equity Mutual Fund Investment Method Strategies

After conducting simulations and calculations on the returns of equity mutual funds and the IHSG benchmark starting from January 2017 to 2022 across three different periods using the dollar cost averaging, lump sum, and value averaging investment strategies, the observed results were obtained in the following outcomes.

Table 1. Investment Return of Equity Mutual Fund

Mutual fund	DCA1 (1 Year)	DCA 2 (3 Year)	DCA 3 (6 Year)	LS 1 (1 Year)	LS 2 (3 year)	LS 3 (6 year)	VA 1 (1 year)	VA 2 (3 year)	VA 3 (6 year)	Mean
Manulife Saham Andalan	6.10%	-2.04%	9.30%	9%	3%	17%	6.20%	-0.76%	18.80%	7.40%
Tram										
Consumption Plus Kelas A	11.30%	3.23%	2.10%	20.60%	21%	16.50%	11.40%	3.80%	7.20%	10.79%
Schroder Indo Equity Fund	9.30%	2.30%	18.20%	16%	13%	31%	9.00%	2.70%	25.10%	14.07%
Mandiri Investa Equity Movement	7.90%	36.39%	11.70%	12%	65%	45%	8%	58%	24.10%	29.79%
Sucorinvest Equity Fund	8.50%	9.23%	30.60%	27%	42%	79%	8.60%	9.90%	47.90%	29.19%
Indeks Harga Saham Gabungan (IHSG)	11.60%	4.47%	13.90%	20%	19%	30%	11.80%	4.90%	19.10%	14.97%
Mean	9.12%	8.93%	14.30%	17.43%	27.17%	36.42%	9.17%	13.09%	23.70%	

In the table 1, it can be observed that the average returns of equity mutual funds and the benchmark in Indonesia during 2017-2022, starting from January 2017, show the highest results in the LS (Lump Sum) investment strategy for period 3 (6 years) at 36.42%. Subsequently, the highest returns are in the LS 2, VA (Value Averaging) 3, LS 1, DCA (Dollar Cost Averaging) 3, VA 2, VA 1, DCA 1, and DCA 2 strategies, respectively.

From the observed results, it is evident that the LS 3 strategy yields the highest return from the Sucorinvest Equity Fund, achieving a return rate of 79% at the end of the observation period. Additionally, within the DCA strategy, the highest return is achieved by the Mandiri Investa Equity Movement with DCA 2, amounting to 36.39%. Similarly, in the VA strategy, the highest return is also achieved by the Mandiri Investa Equity Movement with VA 2, reaching 58%.

Furthermore, it can be noted that the smallest return during the observation period among the mentioned mutual fund strategies is from the DCA strategy, particularly the Manulife Saham Andalan in DCA 2, with a return of -2.04% of the total invested capital. Similarly, in the LS observation, the smallest return is from Manulife Saham Andalan during LS 2, and for the VA strategy, the lowest return is also from Manulife Saham Andalan at -0.76% during VA 2. In terms of benchmark comparison, both Mandiri Investa Equity Movement and Sucorinvest Equity Fund outperform the IHSG benchmark in the mutual fund simulation.

Analyzing the mutual fund calculation table, it can be inferred that on average, the magnitude of returns for equity mutual funds during the observation period follows the pattern: $LS\ 3 > LS\ 2 > VA\ 3 > LS\ 1 > DCA\ 3 > VA\ 2 > VA\ 1 > DCA\ 1 > DCA\ 2$.

The Lump Sum (LS) investment strategy has the potential to generate higher returns compared to the Dollar Cost Averaging (DCA) and Value Averaging (VA) strategies. This is attributed to the fact that in the LS strategy, investors allocate their entire investment assets into the mutual fund at the beginning of the investment period. Throughout this period, the Net Asset Value (NAV) of the mutual fund continues to increase, even in the face of the crisis in 2020, and it further increases by the end of the investment period in 2022. Consequently, the return value at the end of the investment period tends to be higher compared to the DCA and Value Averaging strategies.

Additionally, in Hypothesis Testing for Return Results of Mutual Fund Investment Strategies, based on the research findings with the three strategy methods that have been proven through mutual fund simulations, the statistical testing using the SPSS application is as follows:

In the Normality test results, it was found that the data is not normally distributed. Therefore, an alternative test to ANOVA, namely the Kruskal-Wallis test, was conducted. The results led to the conclusion that, when considering the ranking order of mean values, the highest mean rank is associated with the Lump Sum Strategy for Period 3. When

arranged in order, it becomes $LS\ 3 > VA\ 3 > LS\ 2 > LS\ 1 > DCA\ 3 > VA\ 1 > DCA\ 1 > VA\ 2 > DCA\ 2$. Furthermore, the obtained Asymp Sig of 0.006 is smaller than 0.05, which implies that there is a significant difference. As a result, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. This signifies that there is a difference in the results of investment strategies for each period, i.e., Dollar Cost Averaging, Lump Sum, and Value Averaging, in investing in Mutual Funds.

4.2. Result of Calculation Equity Mutual Fund Performance Analysis

To analyze the level of return generated by the 5 equity mutual funds and the IHSG benchmark sample, several calculations were carried out, including return data for equity mutual funds, standard deviation, and beta. Subsequently, the data was analyzed using the Sharpe ratio and Treynor ratio methods, and each of these datasets was subjected to statistical testing.

4.2.1. Performance Calculation of Equity Mutual Fund Returns

Table 2. Equity Mutual Fund Investment Returns

Year	Return Manulife Saham Andalan	Return Tram Consumption Plus Kelas A	Return Schroder Indo Equity Fund	Return Mandiri Investa Equity Movement	Return Sucorinvest Equity Fund	Return IHSG
2017	8%	20%	15%	12%	26%	20%
2019	3%	20%	13%	65%	42%	19%
2022	16%	16%	31%	44%	79%	29%
Mean	9%	19%	20%	40%	49%	23%

The table 2 shows the average returns of equity mutual funds over 3 periods of 1 year, 3 years, and 6 years as follows:

- Period 1, from January 2017 to December 2017, indicates that the Sucorinvest Equity Fund achieved the best result with a profit of 26%.
- Period 2, from January 2017 to December 2019, had the highest return in Mandiri Investa Equity Movement, which outperformed other equity funds and the benchmark with a gain of 65%.
- Period 3, from January 2017 to December 2022, shows that the Sucorinvest Equity Fund obtained the best result, namely 79% return.
- The best average return among equity mutual funds is the Sucorinvest Equity Fund at 49%, surpassing other mutual funds and also outperforming the IHSG benchmark over the same period.
- In the hypothesis regarding the performance of equity mutual funds and the IHSG benchmark from the above research results, there are equity mutual funds that outperform the IHSG, namely the Sucorinvest Equity Fund with an average of 49%, and the Mandiri Investa Equity Fund with an average of 40%, compared to the IHSG's average performance of 23%. When ranked, the results are Sucorinvest Equity Fund > Mandiri Investa Equity Movement Fund > IHSG > Schroder Indo Equity Fund > Tram Consumption Plus > Manulife Saham Andalan.

Furthermore, a statistical test is conducted using the One-Way Anova Test, Based on the results of the statistical test using One-Way Anova, which was chosen because the data is normally distributed, it can be concluded that there is a significant difference in returns for each mutual fund product compared to the IHSG benchmark. This is evident from the table, where the calculated significance value (sig.) is greater than 0.05, specifically 0.031. Therefore, it can be concluded that the performance of mutual fund returns exhibits a higher level of return compared to the performance of the IHSG.

4.2.2. Standard Deviation and Annualized Standard Deviation of Equity Mutual Funds

Standard deviation and annualized standard deviation are measures of risk for an investment instrument. To determine the level of risk in the sampled equity mutual funds in the research, calculations are performed using the STDEVA formula from Excel's functions. Since the data is available on a monthly basis, the results are in the form of monthly return standard deviation for three observation periods: (1) The first period is 1 year, which is 2017. (2) The second period is 3 years from 2017 to 2019. (3) The third period is from 2017 to 2022. Additionally, the standard deviation of the mutual funds is calculated, yielding the Table 3.

Table 3. Equity Mutual Funds Standard Deviation Table

Period	Std Dev Manulife Saham Andalan	Std Dev Tram Consumption Plus Kelas A	Std Dev Schroder Indo Equity Fund	Std Dev Mandiri Investa Equity Movement	Std Dev Sucorinvest Equity Fund
1 st Period	4.15%	3.48%	2.89%	3.77%	3.51%
2 nd Period	7.02%	5.85%	4.25%	10.79%	5.85%
3 rd Period	6.13%	5.01%	3.92%	8.64%	5.13%

Based on the calculations (Table 3), it can be concluded that during the first period, Manulife Saham Andalan equity mutual fund has the highest level of risk compared to other equity mutual funds, with a value of 4.15%, while Schroder Indo Equity Fund has the lowest level of risk at 2.89%. For the second period, the highest risk is associated with Mandiri Investa Equity Movement fund with a value of 10.79%, while two equity mutual funds, Tram Consumption Plus and Sucorinvest Equity Fund, share the lowest risk level at 5.85%. Moving on to the third period, the fund with the highest risk is Mandiri Investa Equity Movement with a value of 8.64%, and the one with the lowest risk is 5.01%.

The obtained standard deviation values are then further processed using statistical tools to determine if there is a significant difference in risk levels among the investments.

Based on the data in the Kruskal-Wallis test results for equity mutual fund standard deviation, it can be concluded that for the 5 equity mutual funds and 1 IHSG benchmark, the Asym. Sig (P-Value) 0,720 > 0.05. This implies that there is no significant difference between the mutual funds and the benchmark.

Next, calculations for annualized standard deviation data are provided, as shown in the table 4.

Table 4. Equity Mutual Funds Annualized Standard Deviation Table

Period	Ann. Risk Manulife Saham Andalan	Ann. Risk Tram Consumption Plus Kelas A	Ann. Risk Schroder Indo Equity Fund	Ann. Risk Mandiri Investa Equity Movement	Ann. Risk Sucorinvest Equity Fund
1 st Period	5.86%	6.39%	6.67%	7.86%	7.33%
2 nd Period	12.75%	10.32%	8.48%	32.31%	11.77%
3 rd Period	19.59%	16.22%	12.64%	27.32%	17.04%

Based on the calculations (Table 4), the annualized standard deviation per year for period 1, period 2, and period 3 shows that among the equity mutual funds, Mandiri Investa Equity Movement has the highest risk values: 17.86% for period 1, 32.31% for period 2, and 27.32% for period 3. On the other hand, the lowest annual risk values are attributed to Tram Consumption Plus for period 1 at 6.39%, Schroder Indo Equity Fund for period 2 at 8.48%, and both Schroder Indo Equity Fund and Tram Consumption Plus for period 3 at 12.64%.

Furthermore, the annual standard deviation data in the above table undergo statistical testing, and the normality test is satisfied. In this case, the one-way ANOVA test is used.

Based on the data of the One-Way ANOVA test results for annual standard deviation of equity mutual funds and IHSG benchmark, it can be concluded that for the 5 equity mutual funds and 1 IHSG benchmark, the Sig (P-Value) 0,258 > 0.05. This implies that there is no significant difference between the equity mutual funds and the benchmark IHSG in terms of their annual standard deviation.

4.2.3. Beta of Equity Mutual Funds

The beta of an equity mutual fund is a mathematical value that measures the sensitivity of the fund's returns to the overall market returns, typically represented by the IHSG index. A high beta value indicates higher risk, while a low beta value indicates lower risk. Calculating beta involves using monthly return data for both the IHSG index and the respective mutual fund products. A beta value above 1 signifies higher sensitivity of the mutual fund to market movements, a beta value below 1 indicates lower sensitivity, and a negative beta signifies an inverse relationship between the mutual fund and the market.

Table 5. Equity Mutual Funds Beta Table

Period	Beta Manulife Saham Andalan	Beta Tram Consumption Plus Kelas A	Beta Schroder Indo Equity Fund	Beta Mandiri Investa Equity Movement	Beta Sucorinvest Equity Fund
1st Period	0.72	0.87	0.88	1.05	0.42
2nd Period	1.19	1.02	0.83	0.65	0.92
3rd Period	1.29	1.15	0.87	1.08	1.11

From the results on Table 5, it can be concluded that for period 1, the equity mutual fund with a beta above 1 is Mandiri Investa Equity Movement, indicating higher sensitivity compared to other equity mutual funds towards market movements. On the other hand, Sucorinvest Equity Fund has the lowest sensitivity with a beta value of 0.42. In period 2, there are 2 mutual funds with beta values above 1: Manulife Saham Andalan with 1.19 and Tram Consumption Plus with 1.02. The lowest sensitivity is Mandiri Investa Equity Movement with 0.65. Moving to period 3, the mutual funds with beta values above 1 include Manulife Saham Andalan with 1.29, Tram Consumption Plus with 1.15, Mandiri Investa Equity Movement with 1.08, and Sucorinvest Equity Fund with 1.11. On the other hand, Schroder Equity Movement has a beta value below 1 at 0.87.

Next, statistical testing is conducted using the One-Way ANOVA test due to the normal distribution, and the results are as follow

From the data of the One-Way ANOVA test results for equity mutual fund beta, it can be concluded that for the 5 equity mutual funds, the Sig (P-Value) $0.708 > 0.05$. Therefore, there is no significant difference between the betas of the examined equity mutual funds.

4.2.4. Performance Measurement of Mutual Fund Portfolio

Portfolio performance measurement can be done by comparing the average return of the portfolio with the market index return and the risk-free rate (SBI rate). A portfolio is considered to outperform when its average return is higher than the market index return. Conversely, a portfolio is considered to underperform when its average return is lower than both the market index returns and the risk-free rate.

1) Sharpe Method Performance Analysis

The Sharpe ratio measures performance by focusing on overall risk using the standard deviation. The Sharpe ratio combines two important factors: the investment's achieved return and the associated risk. It assists investors in assessing and evaluating investments by considering the expected return and the involved risk. The interpretation of the Sharpe ratio value is as follows: In financial performance analysis using the Sharpe method, data such as average portfolio return, standard deviation, and risk-free rate are required.

Table 6. Sharpe Method Mutual Fund Performance Table

Year	Sharpe Manulife Saham Andalan	Sharpe Tram Consumption Plus Kelas A	Sharpe Risk Schroder Indo Equity Fund	Sharpe Risk Mandiri Investa Equity Movement	Sharpe Risk Sucorinvest Equity Fund
2017	0.26	2.05	1.25	0.63	2.66
2019	-0.37	1.27	0.66	1.77	2.92
2022	0.46	0.55	1.88	1.36	4.21

Interpretation of Results: Evaluating the Sharpe ratio results aids in interpreting portfolio performance. A Sharpe ratio higher than 1 indicates better performance because the portfolio yields unbalanced returns that are superior relative to the risk taken.

In the provided data, the equity mutual fund with the best investment performance in period 1 is the Sucorinvest Equity Fund with a value of 2.66. In period 2, Sucorinvest Equity Fund maintains its superior investment performance with a ratio of 2.92. Similarly, during period 3, Sucorinvest Equity Fund remains the best performer with a ratio of 4.21. Based on these calculations, it can be inferred that Sucorinvest Equity Fund currently exhibits the most exceptional equity mutual fund performance. This is evident from its higher Sharpe ratio values.

Subsequently, a hypothesis test is conducted using the ANOVA test in the SPSS application, and the outcomes are presented in the Table 7.

Table 7. ANOVA Method Sharpe Test Results Table

ANOVA					
Sharpe Results					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.632	4	3.408	6.660	.007
Within Groups	5.117	10	.512		
Total	18.749	14			

Enclosed is the table containing the results of the One-Way ANOVA statistical test based on the Sharpe ratio performance data of equity mutual funds. According to the results of the test, where the significance level (Sig) is $0.007 < 0.05$, it can be concluded with a 95% confidence level that there is a significant difference in the performance of equity mutual funds based on the Sharpe ratio index.

To determine the degree of difference between each equity mutual fund, a post hoc test is performed using the LSD method. The statistical test outcomes are presented in the Table 8.

Table 8. LSD Method Sharpe Test Results Table

Multiple Comparisons						
Dependent Variable: Sharpe Result						
LSD						
(I) Reksadana	(J) Reksadana	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
SharpeMSA	SharpeTCOP	-1.17333	.58407	.072	-2.4747	.1281
	SharpeSCHIE	-1.14667	.58407	.078	-2.4481	.1547
	SharpeMIEM	-1.13667	.58407	.080	-2.4381	.1647
	SharpeSEF	-2.97000*	.58407	.000	-4.2714	-1.6686
SharpeTCOP	SharpeMSA	1.17333	.58407	.072	-.1281	2.4747
	SharpeSCHIE	.02667	.58407	.964	-1.2747	1.3281
	SharpeMIEM	.03667	.58407	.951	-1.2647	1.3381
	SharpeSEF	-1.79667*	.58407	.012	-3.0981	-.4953
SharpeSCHIE	SharpeMSA	1.14667	.58407	.078	-.1547	2.4481
	SharpeTCOP	-.02667	.58407	.964	-1.3281	1.2747
	SharpeMIEM	.01000	.58407	.987	-1.2914	1.3114
	SharpeSEF	-1.82333*	.58407	.011	-3.1247	-.5219
SharpeMIEM	SharpeMSA	1.13667	.58407	.080	-.1647	2.4381
	SharpeTCOP	-.03667	.58407	.951	-1.3381	1.2647
	SharpeSCHIE	-.01000	.58407	.987	-1.3114	1.2914
	SharpeSEF	-1.83333*	.58407	.011	-3.1347	-.5319
SharpeSEF	SharpeMSA	2.97000*	.58407	.000	1.6686	4.2714
	SharpeTCOP	1.79667*	.58407	.012	.4953	3.0981
	SharpeSCHIE	1.82333*	.58407	.011	.5219	3.1247
	SharpeMIEM	1.83333*	.58407	.011	.5319	3.1347

*. The mean difference is significant at the 0.05 level.

Based on the results of the LSD statistical test, it can be concluded that there are significant performance differences between different equity mutual funds. This conclusion is drawn at a 95% confidence level, as explained in the interpretation on Table 9.

Table 9. Interpretation Table of LSD Method Sharpe Test Result

	Sharpe MSA	Sharpe TCOP	Sharpe SCHIE	Sharpe MIEM	Sharpe SEF
Sharpe MSA		Same	Same	Same	Different
Sharpe TCOP	Same		Same	Same	Different
Sharpe SCHIE	Same	Same		Same	Different
Sharpe MIEM	Same	Same	Same		Different
Sharpe SEF	Different	Different	Different	Different	

After examining the LSD Analysis table for the Sharpe index, it can be concluded that Sucorinvest Equity Fund significantly differs in terms of performance compared to other equity mutual funds. Meanwhile, the performance of the other equity mutual funds remains consistent, except when compared to Sucorinvest Equity Fund.

2) Treynor Method Mutual Fund Performance Analysis

The Treynor method is one of the techniques used to analyze portfolio performance by considering the ratio of excess return to systematic risk (market risk). Here are the results of the analysis using the Treynor method. The Treynor ratio emphasizes systematic risk or risk that cannot be diversified away. This risk is measured by beta, which illustrates the sensitivity of an investment to changes in the overall market. The Treynor ratio assists investors in evaluating and assessing investments by considering both the expected return and the systematic risk involved. The Table 10 presents the results of the Treynor method test for the examined equity mutual funds:

Table 10. Treynor Method Mutual Fund Performance Table

Year	Treynor Manulife Saham Andalan	Treynor Tram Consumption Plus Kelas A	Treynor Risk Schroder Indo Equity Fund	Treynor Risk Mandiri Investa Equity Movement	Treynor Risk Sucorinvest Equity Fund
2017	0.02	0.15	0.09	0.05	0.47
2019	-0.04	0.13	0.07	0.88	0.37
2022	0.07	0.08	0.27	0.34	0.65

Interpretation of Results: Evaluating the Treynor ratio results helps in interpreting portfolio performance. A Treynor ratio higher than 0 indicates increasingly optimal and better performance, as the portfolio provides higher excess returns relative to the systematic risk taken.

In the provided data, the equity mutual fund with the best investment performance in period 1 is Sucorinvest Equity Fund with a value of 0.47. For period 2, the best performer is Mandiri Investa Equity Movement with a value of 0.88. Similarly, during period 3, Sucorinvest Equity Fund remains the best performer with a value of 0.65. Based on these calculations, it can be concluded that the best equity mutual fund performance within the presented periods is achieved by Sucorinvest Equity Fund and Mandiri Investa Equity Movement.

Next, a statistical test is conducted to assess the performance of each equity mutual fund against the others. The obtained data is further processed for an ANOVA statistical test as shown in Table 11.

Table 11. ANOVA Method Treynor Test Results Table

ANOVA					
Treynor					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.519	4	.130	3.033	.070
Within Groups	.428	10	.043		
Total	.947	14			

Based on the results of the One-Way ANOVA test, it can be concluded that there is no significant difference in the Treynor index among the equity mutual funds' performances. This conclusion is drawn considering a 95% confidence level where the calculated significance level (Sig.) of the standard deviation is 0.070, which is greater than 0.05.

For comparing the Statistical Methods of Sharpe and Treynor, a normality test is conducted first. If the data is normally distributed, the Independent Samples T-Test is employed. However, if the data is not normally distributed, the Mann-Whitney U Test is used. In this research study, the normality test indicates that the test data is not normally distributed. As a result, the Mann-Whitney U Test is applied, yielding the outcomes shown in Table 12.

Table 12. Mann-Whitney U Test Results Table

Ranks				
	Group	N	Mean Rank	Sum of Ranks
Result	Sharpe	15	21.07	316.00
	Treynor	15	9.93	149.00
	Total	30		
Z			-3.464	
Asymp. Sig. (2-tailed)			.001	

Using a significance level of 0.05 and a two-tailed test, the calculated z-value is -3.464, which falls within the acceptance region of the null hypothesis (H_0). The p-value obtained is less than 0.01, smaller than the established significance level of 0.05. Based on the Mann-Whitney U Test results, there is a significant difference between the two methods, Sharpe and Treynor. This conclusion is further supported by analyzing the mean rank values, where the Sharpe method has a higher mean rank of 21.07 compared to the Treynor method's mean rank of 9.93. In summary, the analysis suggests that when evaluating mutual fund performance, the Sharpe method outperforms the Treynor method.

5. Conclusion

Based on the observations and research findings as explained in Chapter 4, the following conclusions can be drawn, divided into three categories: related to Mutual Fund Performance and Investment Methods, as well as Benchmark Comparisons: In the examined Investment Methods, namely Dollar Cost Averaging, Lump Sum, and Value Averaging strategies for investing in Mutual Funds, the best strategy obtained through simulation was found to be the Lump Sum (LS) strategy. Specifically, the Lump Sum strategy applied over Period 3 (from 2017 to 2022), which covered various market phases such as Trade Wars, the COVID-19 Crisis, and Economic Recovery. This strategy yielded a higher average return compared to the other strategies, both for equity mutual funds and benchmarks. The order of research results during the observation period follows this sequence based on return: $LS\ 3 > LS\ 2 > VA\ 3 > LS\ 1 > DCA\ 3 > VA\ 2 > VA\ 1 > DCA\ 1 > DCA\ 2$. Furthermore, the Kruskal-Wallis Test was conducted and yielded an Asymp Sig of 0.006, which is smaller than 0.05. Thus, the null hypothesis (H_0) is rejected in favor of the alternative hypothesis (H_1), indicating that there is a significant difference in results among the investment strategies of Dollar Cost Averaging, Lump Sum, and Value Averaging. This research aligns with previous studies (Choudhari and Borgaon 2020; Eriksson and Fransson 2021; Gajera et al. 2021; Merlone and Pilotto 2014) albeit with variations. Notably, earlier studies did not include Value Averaging as a variable, whereas in this research, Value Averaging emerged as the best strategy after Lump Sum.

Based on the calculation of mutual fund performance using the Sharpe ratio, the mutual fund with the best investment performance in Periods 1, 2, and 3 was Sucorinvest Equity Fund. Similarly, when using the Treynor ratio, Sucorinvest Equity Fund achieved the best performance in Period 1, Mandiri Investa Equity Movement in Period 2, and Sucorinvest Equity Fund again in Period 3. This suggests that Sucorinvest Equity Fund and Mandiri Investa Equity Movement currently exhibit the best mutual fund performance over various periods. Additionally, statistical tests confirmed that there is a significant difference between the Sharpe and Treynor methods, with better mean rank values found in the Sharpe method. In summary, there is a significant difference between the Sharpe and Treynor methods in measuring mutual fund portfolio performance.

In comparing the strategies of mutual fund products against the IHSG benchmark based on various simulated averages, Mandiri Investa Equity Movement and Sucorinvest Equity Fund outperformed the IHSG benchmark, while others underperformed. Furthermore, portfolio performance was examined, especially using the Sharpe method. The Sharpe ratio combines two crucial factors: the investment's generated rate of return and the associated risk. This aids investors in evaluating investments by considering expected returns and involved risks. A comparison with the IHSG benchmark revealed that Sucorinvest Equity Fund displayed the best investment performance. This conclusion indicates that Sucorinvest Equity Fund outperforms the IHSG benchmark. In essence, both investment strategy and portfolio performance analysis show that some mutual fund products can outperform the IHSG benchmark, as the research

findings suggest that mutual fund performance, when measured using return and risk, exceeds that of the IHSG benchmark.

Limited research time resulted in a restricted sample size, consisting of only 5 mutual funds. The research exclusively focused on equity mutual funds. Future studies should encompass other mutual fund products, such as fixed-income and money market funds.

Recommendations for Further Research Conduct research considering investment periods, time horizons, and different investment methods to evaluate the results in terms of return, risk, and optimal investment strategy. Incorporate mutual fund volume or AUM as a critical factor in the research, alongside the consideration of periods. Extend research to encompass various types of mutual funds, including fixed-income and money market funds.

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