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Analysis of Macroeconomic Conditions on the Performance of Protected Mutual Funds in Indonesia in Moderated Age and Size of Mutual Funds

ABSTRACT

This study aims to find evidence whether Macroeconomic Conditions can affect the Performance of Protected Mutual Funds in Indonesia which is Moderated Age and Size of Mutual Funds for the period January 2018 – August 2023. The motivation for this study comes from identifying the relationship between macroeconomic conditions and mutual fund performance simultaneously is very important because it has significant implications in efforts to improve mutual fund performance against macroeconomic conditions. However, there are limitations to empirical studies on the impact of these mutual funds because the data year series is limited to only a few years. Using the Random Effect Model (REM) panel regression method approach, the analysis period from January 2018 to August 2023 panel data on macroeconomics and mutual funds, it was found that macroeconomic variables of the rupiah exchange rate against the US dollar (NT) had a significant influence on the performance of the highest mutual funds measured by the sharpe ratio. Meanwhile, macroeconomic variables that do not have a significant influence on the performance of protected mutual funds are interest rate (SBI) and inflation (INF) variables. The variable age and size of mutual funds have a significant influence on the performance of protected mutual funds. In addition to these independent variables, this study also used moderator / moderating variables. Moderator variables to see the interaction relationship between moderator variables and predictor variables (independent). Moderator variables are variables that can strengthen or weaken the relationship between independent and dependent variables. The moderator variables of this study are age and size of mutual funds

Kata kunci: Mutual Fund, Macroeconomics, Rupiah Exchange Rate, Panel, REM
Klasifikasi JEL: E50, E22, E42, E43, E44

PENDAHULUAN

In this paper, we study the factors that influence whether there is a significant impact of Macroeconomic Conditions on the Performance of Protected Mutual Funds in Indonesia which are moderated by the Age and Size of Mutual Funds for the period January 2018 - August 2023. The national mutual fund industry continues to experience significant growth. In August 2023, the number of mutual fund investors reached 10.8 million, a 3-fold increase compared to 2020 which was only 3.1 million (KSEI, 2023). However, in 2015 the Indonesian mutual fund industry experienced a financial crisis which caused mutual fund performance to decline significantly. Unstable macroeconomic conditions can affect the

assets managed in mutual funds such as deposits, stocks, bonds and so on. The ever-changing economic conditions require investors to observe macroeconomic changes as one of the bases for making investment decisions and selecting the type of mutual funds. The occurrence of the financial crisis was the background for the presence of protected mutual funds in Indonesia. Protected mutual funds are a type of mutual fund that has a capital protection feature that aims to reduce the risk of loss for investors (Layuk et al., 2022). Protected mutual funds are a type of mutual fund that will protect 100 percent of the investor's principal investment at maturity. These mutual funds tend to be invested in safer capital market and money market instruments. These mutual funds often use various strategies to mitigate potential losses in a declining market, making them more conservative than traditional mutual funds (Darmayanti and Harahap, 2022). In addition, these mutual funds may have higher costs than traditional mutual funds due to the active management and special strategies involved (Wijaya, 2015).

Masu'ud, (2016) in Layuk, et al. (2022) stated that protected mutual funds that are known to have a low risk level can also generate higher returns. Another benefit of protected mutual funds is that the benefits, risks, obligations and how to buy them are relatively the same as other types of mutual funds (OJK, 2022).

The results of research related to several macroeconomic variables that are estimated to affect mutual fund performance tend to show contradictory results. Pardomuan (2005), Dima, Barna and Nachescu (2006), Shukla (2011) stated that interest rates affect mutual fund performance. This finding is supported by the results of research by Ma et al., (2022) that central bank interest rates and exchange rates have a major influence on protected mutual funds, especially those with international investments. When funds have assets in foreign currencies, changes in exchange rates can directly affect the value of those holdings. This exchange rate risk is

particularly relevant for protected mutual funds that aim to protect against downside risk, as currency fluctuations can create an additional layer of volatility. This is in line with the findings of Dima, Barna, and Nachescu (2006) which state that exchange rates affect mutual fund performance. However, this is different from Mofleh Alshogeathri (2011) who found that exchange rates did not affect mutual fund performance.

Coffie (2019) showed that protected mutual funds tend to use various strategies to mitigate the impact of exchange rate fluctuations. One common approach is currency hedging, where funds use financial instruments such as futures or options to offset potential losses due to currency movements. This study has shown that funds that use hedging strategies tend to have lower exposure to exchange rate risk, thus potentially generating more stable returns for investors.

This is in line with the findings of Babbar and Sehgal (2018) who stated that mutual fund size, mutual fund size growth and NAV negatively affect one period ahead of risk-adjusted performance in India, while mutual fund age has a positive impact. Meanwhile, findings from Amaral, Reis & Pinto (2019) show that variables such as risk, rotation, size, age, interest rates, commissions and benchmarks as determinants of mutual fund performance are very significant, which if followed by mutual fund managers, will be able to increase the amount of expected returns. Dwiprakasa and Dharmastuti (2016) also found that the expense ratio and age of mutual funds have a negative and significant effect on the performance of equity mutual funds in Indonesia, while the size of mutual funds and turnover ratio have a positive and significant effect on the performance of equity mutual funds in Indonesia. The Indonesian mutual fund industry cannot be said to be stable, still experiencing fluctuations in Net Asset Value per unit which is influenced by external factors and government policies, such as interest rates and national and global economic conditions. Therefore, to understand mutual funds in Indonesia, it is necessary to conduct a Macroeconomic Factor

Analysis on the Performance of Protected Mutual Funds moderated by the age and size of the mutual fund for the period January 2018 - August 2023.

LITERATURE

Mutual Funds, According to Law Number 8 of 1995 concerning Capital Markets, the definition of a mutual fund is a vehicle used to collect funds from investors to be invested in a portfolio of securities by an investment manager. Widjaja (2006) states that mutual funds are a form of service provision established to help investors who want to participate in the capital market without direct involvement in procedures, administration, and analysis in a capital market. Based on the concentration of the mutual fund portfolio managed by the investment manager, mutual funds can be divided into several types, namely (Manurung, 2008):

1. Money market funds make investment choices in types of money market investment instruments with a maturity of less than one year. The forms of investment instruments include Bank Indonesia Certificates (SBI), Deposit Certificates, Time Deposits, and Money Market Securities.;
2. Fixed income mutual funds are mutual funds that invest investor funds in the form of debt securities of at least 80% of their total assets. The debt securities (bonds) selected can be bonds issued by companies or governments.;
3. Stock mutual funds are mutual funds whose investment portfolio is in stock instruments with a minimum amount of 80% of the total investment assets. This mutual fund has the highest risk compared to other types of mutual funds, although the potential profit that can be obtained is also high (high risk high return). The high profit on this mutual fund is obtained from capital gains from stock sales and dividend distribution;

4. Mixed mutual funds allocate their investment funds in the form of various investment portfolios, which can be in the form of money markets, bonds, or stocks with various portions. Investment allocation can be determined by looking at the current market conditions (market timing) whether it is more consistent in investing in stocks, debt securities, or money markets.;
5. Protected mutual funds are mutual funds whose principal investment value is protected if it is cashed out at the end of the agreement period. This mutual fund provides protection for the initial investment deposited. If the investor makes a cash out before the agreement period, they will experience a loss because it does not make the initial principal investment the same as at the end of the investment period. Usually, investments are made in fixed income assets that have a certain time period, such as bonds.

Net Asset Value (NAV) of Mutual Funds, one of the benchmarks in monitoring the results of mutual fund portfolios. Net Asset Value (NAV) can be formulated as follows:

$$NAV_t = (MVA_t - LIAB_t/NSO_t) \qquad (2.1)$$

Dimana,

NAV_t = Net asset value at period t

MVA_t = total market value of assets in period t

$LIAB_t$ = total liabilities of Mutual Funds in period t

NSO_t = number of investment units outstanding in period t

NAV is highly dependent on the performance of the assets that make up the mutual fund portfolio, so it is natural that NAV will increase or decrease. Changes in market prices of mutual fund assets are one of the factors that influence the increase or decrease in NAV over time. Mutual fund performance, an analysis carried out to conduct an evaluation that aims to determine the development of the performance of mutual funds that have been managed in

a certain period. This aims to see whether the mutual fund products owned are in accordance with the planned returns. The performance of a mutual fund can be seen from its NAV value. However, this mutual fund performance measurement has a weakness, namely that it is only suitable for comparing the performance of the mutual fund from time to time, not the mutual fund with other mutual funds in a certain period of time. The information available to ordinary investors is the NAV value, the percentage change in NAV in 1 day, 1 month, 1 year, and the percentage change in NAV since the mutual fund product was marketed. So investors only know the performance at that time. And comparisons cannot be made between mutual fund products, because the risk profile of each mutual fund product is different, so the comparison is not apple-to-apple.

Mutual fund performance measurements that can be used as a comparison with other mutual funds must take into account the risk aspect or are called risk adjusted returns (RAR). The theory of risk adjusted performance was created to overcome the constraints of comparing mutual fund performance that is not apple-to-apple. This theory introduces a technique for measuring mutual fund performance by considering risk in the calculation.

According to Manurung (pp. 142-144, 2007), there are three methods of measuring mutual fund performance that can describe the ability of investment managers to manage their mutual funds, namely the Sharpe ratio, Treynor and Jensen methods.

1. Sharpe Performance

Sharpe performance measures portfolio performance with total risk as its indicator. This index bases its calculation on the concept of the capital market line as a benchmark, namely by dividing the portfolio risk premium by its standard deviation.

$$S_p = \frac{R_p - R_f}{\sigma_{TR}} \qquad (2.2)$$

Keterangan:

S_p = Sharpe Performance

R_p = average return of the portfolio over the measurement period

R_f = average return of risk-free assets over the measurement period

σ_{TR} = standard deviation of the portfolio over the measurement period

2. Treynor Performance

Treynor performance that measures portfolio performance with its systematic risk (beta) as an indicator. This performance looks at portfolio performance by linking the level of portfolio return with the amount of risk of the portfolio..

$$T_p = \frac{R_p - R_f}{\beta_p} \quad (2.3)$$

Keterangan:

T_p = Treynor Performance

R_p = average return of the portfolio over the measurement period

R_f = average return of risk-free assets over the measurement period

β_p = systematic risk of the portfolio over the measurement period

3. Jensen Performance

In 1968, Jensen proposed another performance measure based on the asset pricing model that could test on a percentage basis, based on a risk adjustment, how well a mutual fund performed. The initial model that measures the CAPM equilibrium relationship between risk and return is as follows:

$$E(R_i) = r + [E(R_m) - r]\beta_i \quad (2.4)$$

Jensen performance index tests the difference between the actual return obtained during the evaluation period and the expected return using CAPM. By using historical data, it can be used to estimate the parameters needed in CAPM, so that it can produce an equation.:

$$\bar{R}_i = r + [\bar{R}_m - r]\hat{\beta}_i + \alpha_i \quad (2.5)$$

Where αi is the deviation from its line, in addition αi is also the Jensen performance index. Jensen performance measures portfolio performance with its systematic risk (beta) as an indicator.

This performance shows the difference between the actual return rate obtained by the portfolio and the expected return rate if the portfolio is on the capital market line (CML). The higher the positive alpha value, the better the performance of a portfolio.

$$R_p - R_f = \alpha_p + (R_m - R_f)\,\beta_p \quad (2.6)$$

$$\text{So,} \quad \alpha_p = (R_p - R_f) - (R_m - R_f)\beta_p \quad (2.7)$$

Keterangan:

α_p = Jensen's Performance

R_p = average return of the portfolio over the measurement period

R_f = average return of risk-free assets over the measurement period

R_m = average market return over the measurement period

β_p = Systematic risk during the measurement period

Factors that Influence Mutual Fund Performance, Internal Factors According to Bintomo (2016), mutual fund performance is influenced by many factors, including:

1. Past Performance

Past performance reflects current performance. Persistence in performance occurs when past performance is positively correlated with current performance. Dahlquist, Magnus, Engstrom, Stefan and Soderlind, Paul (2000) stated that there is a positive influence between past performance and current performance. This is different from Philpot, James, Heart, Douglas, Rimbey, James N, and Schulman Craig T (1998) who stated that past performance cannot accurately predict future performance..

2. Fund Size

Mutual fund size indicates the size of the assets managed. Mutual fund size is a presentation of the amount of mutual fund capitalization, in addition, mutual fund size is a measuring tool in determining the size of a mutual fund based on the funds it manages which are described by Total Net Assets.

Vijayakumar et al. (2012) found that mutual fund size has a positive effect on mutual fund performance. However,

Indro, Jiang, Hu, and Lee (1999) found that the size of actively managed mutual funds has a positive effect on mutual fund performance until it reaches the optimal fund size, where after passing the optimal fund size, the size of the mutual fund will have a negative effect on mutual fund performance. While Sing (2007) found that the size of the fund does not have a significant effect on mutual fund performance. Petajisto (2013) argued that fund size has no effect on performance, because it will be more related to the type of active management. Chen, et.al (2004) stated that fund size does not have much impact on performance, what is more important is how the funds are managed.

3. Fund Age

The age of a mutual fund indicates when the mutual fund began trading on the capital market. According to Rao (2003), many investors prefer long-term mutual funds. Mutual funds with a longer life cycle have a longer track record, so they can provide a better picture of performance to their investors. According to Cahyono (2010), in investing in mutual funds, it is better to choose mutual funds that have at least five years of experience. This is because five years is considered the average length of one economic cycle in the capital market. The older the age of a mutual fund, the better its performance, because the experience it has is sufficient to provide the returns expected by investors (Winingrum, 2011). According to Pulungan (2004), Afza and Rauf (2009) and Winingrum (2011), the age of an investment fund has a positive effect on the performance of the fund... However, according to O'Neal and Page (2000), See and Ruzita (2012), the age of a mutual fund has a negative effect on the performance of the mutual fund.

External Factors, Several macroeconomic factors that influence mutual fund performance are as follows,

1. Bank Indonesia interest rates

Government policy, especially the interest rate of Bank Indonesia Certificates (SBI). This means that the lower the SBI interest rate, the less attractive it is for investors to invest their money in banking instruments such as

deposits, savings and vice versa; Of course, it will attract investors to invest their funds in funds such as stocks, bonds, and mutual funds. although the risk is also greater. Basically, the SBI interest rate will be a benchmark for investors to compare with investors in other sectors. The increase in interest rates will have an impact on increasing investment costs and decreasing the size of investment costs which will later reduce the expected income investment..

2. inflation

According to Mankiw (2018), inflation is an increase in the average price level in an economy. Meanwhile, according to Boediono (2014), inflation is simply defined as a general and constant tendency for price increases. Such as price increases due to seasons and major holidays, meaning that price increases that occur at certain times do not have a secondary impact and are not inflation. Elton Gruber, Blake (1993) explains that inflation has a negative and significant effect on mutual fund performance. Meanwhile, Diaconasu, Asavoaei (2011) in America explains that there is a positive correlation between inflation and mutual funds. At the same time in Romania there is no significant evidence between inflation and mutual funds.

3. Exchange Rate

According to Mankiw (2015, 215), the exchange rate of a country's currency relative to the currency of another country. An increase in the value of a currency can weaken the performance of an investment fund if converted into another foreign currency. Dima, Bogdani, Barna, Flavia, and Nachescu (2006) found that the exchange rate affects mutual fund returns, but Akbar's research (2002) found that Mofleh (2011) did not affect the exchange rate. affects the results of investment funds. Risk, the deviation of the level of profit obtained from the value expected by an investor. Investors expect returns in the future, but the amount of return can rarely be predicted accurately. Actual return is almost always different in value from expected return. The difference between these two values is called risk. Markowitz states that the expected risk depends on the diversity of possible

expected outcomes. Jones (2007) states that risk is the possibility of a difference between the actual return and the expected return. One measure used for risk is the standard deviation of the return. The risk faced by investors is symbolized by variance or standard deviation. Standard deviation (σ) is a standard used to measure the total risk level of a portfolio reflected by the root of the variance. This measurement aims to compare how much the individual's observed (actual) value differs from its expected value over time. The formula is (Jones, 2007):

$$\sigma = \frac{\sqrt{(X_i - \bar{x})^2}}{n-1} \qquad (2.13)$$

For,

σ = *Standard deviasi*

Xi = *Actual return*

$\bar{x}$ = *Average return*

n-1 = The number of observations subtracted by one

Standard deviation is the total risk of a portfolio, which is divided into two types of risk, namely systematic and unsystematic risk. Diversification cannot continue to reduce risk to zero, but is limited to a certain value. The type of risk that can be reduced by diversification is called unsystematic risk. This risk is related to company or industry-specific factors that can generally be avoided or reduced through diversification. Investors can reduce unsystematic risk by increasing their shares or diversifying (see Figure 2.1). In other words, the more shares in a portfolio owned by an investor, the lower the unsystematic risk curve approaches the amount of systematic risk. This also means reducing total risk, so that total risk is almost close to systematic risk.

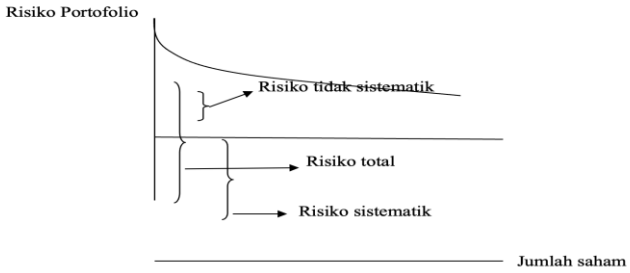

Figure 2.3. Portofolio Risk

Source: Tandelilin, 2010

Meanwhile, the risk that remains after the diversification process is called systematic risk. Systematic risk is caused

by factors that affect all companies, such as economic conditions and tax policies (Husnan, 2006). Systematic risk can be measured using beta. Beta is a coefficient of systematic risk that shows the relationship between stocks and the market. Beta is a common measure of risk because it reduces the covariance and variance of the market portfolio. The beta of a stock shows the largest change in the stock's return compared to the market return. The beta value of stock X can be calculated using the following formula (Jones, 2007):

$$\beta^2 = \frac{Cov_{x,m}}{\sigma^2 m} \qquad (2.14)$$

Where,

$Cov_{x,m}$ = covarian for *return* of security X with market *return* σ^2

m = *variance for market return*

J If a stock X has a beta of 1.5, it means that the increase or decrease in stock X is 1.5 times the change in the market return rate. If the beta of a stock is greater than zero, then the stock price volatility is greater than the market index volatility. If the beta of a stock is equal to 1, then the stock price volatility is the same as the market index volatility. If the beta of a stock is less than 1, the stock price volatility is weaker or lower than the market volatility.

In predicting the expected stock return, there are two models that are often used by investors, namely CAPM (Capital Asset Pricing Model) and APT (Arbitrage Pricing Theory). The CAPM (Capital Asset Pricing Model) and APT (Arbitrage Pricing Theory) equilibrium models are alternative tools used by investors to predict stock returns

Capital Asset Pricing Model (CAPM), is a model that can be used to determine the expected return (required rate of return) for risky assets. CAPM was proposed by William Sharpe, John Lintner and Jan Moissin which is a theory that shows that the rate of return on a risky asset is a function of the risk-free rate of return (risk-free asset), the rate of return on the portfolio with average risk and the volatility of the rate of return on the risky asset to the rate of return on the market portfolio (market return). In the mid-1960s William

Sharpe, John Lintner, and Jack Treynor developed the Capital Asset Pricing Model (CAPM) model which was developed after 12 years of Markowitz's theory. The CAPM model provides an overview to predict the relationship between the risk of an asset and its expected return. This model can be used to provide a benchmark rate of return for various investment possibilities, and can predict the expected return of an investment. CAPM is stated in the following equation (Husnan, 2006):

$$E_{(r_i)} = r_f + \beta_i\left(E(r_m) - r_f\right) \quad (2.15)$$

Dimana,

$E_{(r_i)}$ = expeted return dari asset i

r_f = risk free rate

β_i = risiko sistematis dari asset (beta)

$E(r_m)$ = return pasar

Besaran koefisien beta dapat dicari dengan cara meregresikan return saham dengan return pasar (Tandelilin, 2010):

$$R_i = \alpha_i + \beta_i R_M + e_i \quad (2.16)$$

Dimana,

R_i = tingkat pendapatan sekuritas i

α_i = tingkat pendapatan indeks pasar

β_i = slop (beta)

α_i = intersep

e_i = random residual eror

Some assumptions used in CAPM are that investors have the same perception of market conditions and are price-takers, there are no taxes or transaction costs, investors can borrow or lend in unlimited amounts at a fixed interest rate that is not risky and all traded assets are liquid.

Arbitrage Pricing Theory (APT), Capital Asset Pricing Model is not the only theory that tries to explain how an asset is priced by the market. Ross (1976) formulated a theory called Arbitrage Pricing Theory (APT). According to Tandelilin (2010), APT states that the expected return of a security can be influenced by various factors, not just one factor (market portfolio) as stated in CAPM theory.

APT is built on the basis that one of its goals is the absence of arbitrary opportunities. Compared to CAPM, APT does not require a market portfolio as a reference portfolio, but any stock market portfolio can be a reference portfolio, so APT has more flexibility than CAPM because it does not require the problem of an unobservable market portfolio. investment portfolio. market portfolio. No problem. APT has the same function as CAPM. Both provide performance benchmarks that can be used for financial planning, assessment or evaluation of investment performance. In general, APT provides a balance between non-diversifiable risk (risk components) that require costs to support risk premiums, and diversified risk that does not require costs. APT is also based on rational market equilibrium that includes arbitrage opportunities. In the same CAPM model, the process of achieving equilibrium prices is achieved simultaneously because there are many investors, but the capital market share is very small. The APT formula used to calculate stock market risk is as follows (Tandelilin, 2010):

$$R_i = \alpha_i + b_{i1}F_1 + b_{i2}F_2 + \cdots + b_{in}F_n + e_i \quad (2.17)$$

Dimana,

R_i = return saham i

b_{in} = sensitifitas return saham i terhadap faktor ke-n

α_i = konstanta

F_n = faktor ke-n saham yang mempengaruhi return saham i

e_i = random error

Meanwhile, the formula for calculating expected stock returns based on the APT model is as follows (Tandelilin, 2010):

$$E(R_i) = R_f + b_{i1}\big(E(F_1) - R_f\big) + b_{i2}\big(E(F_2) - R_f\big) + \cdots + b_{in}\big(E(F_n) - R_f\big) \quad (2.18)$$

Dimana,

$E(R_i)$ = return harapan saham i

$E(F_1) - R_f$ = premi risiko

b_{in} = risiko sistematis saham i terhadap faktor ke-n

Asumsi yang mendasari model Arbitrage Pricing Theory (APT) adalah: (1) Pasar Modal dalam kondisi persaingan sempurna, (2) investor adalah risk averse, (3) investor memiliki kepercayaan yang bersifat homogen dan 4) return diperoleh dengan

RESEARCH METHODOLOGY

The research method used in this study is a quantitative method because the data processed is data. Quantitative research is a type of research that produces findings achieved by using statistical procedures with the aim of testing the established hypothesis.

Dependent variable

The dependent variable is a variable that is explained or influenced by the independent variable. The dependent variable used in this study is the performance of protected mutual funds. The performance of protected mutual funds is measured using the Sharpe ratio.

Independent variable

Reference interest rate, an instrument used by Bank Indonesia (BI) in the context of open market operations as an implementer of monetary policy. Since August 19, 2016, BI has strengthened the monetary operations framework by implementing a new reference interest rate or policy interest rate, namely the BI-7 Day Reverse Repo Rate (BI7DRR) replacing the BI Rate. The data used for the reference interest rate proxy is the BI-7 Day Reverse Repo Rate.

Inflation, the tendency for prices of goods and services to rise in general which continues continuously. Inflation is measured by the consumer price index (CPI). The inflation data used is monthly inflation for the period January 2018 to September 2023.

The exchange rate is the exchange rate between two countries agreed upon by the residents of both countries to trade with each other. The monthly rupiah to dollar exchange rate data is obtained from the daily middle rate data at the end of the month.

The age of the mutual fund reflects the length of time the mutual fund has been traded to the public. The age of the mutual fund is calculated from when the mutual fund was introduced and registered with the OJK based on the effective date the mutual fund was offered until the research period.

The size of the mutual fund is a measuring tool for the size of the mutual fund based on the funds managed. The size of the mutual fund is measured based on the amount of funds managed or the Net Asset Value (NAB) of the protected mutual fund in the form of monthly data.

Moderator variables

Mutual fund age variable, in moderating the influence of interest rates, inflation and exchange rates on mutual fund performance.

Mutual fund size variable, in moderating the influence of interest rates, inflation and exchange rates on mutual fund performance

Panel Data Analysis Method

The data analysis technique used in this study is panel data regression because it consists of cross-sections, namely data from 32 protected mutual fund products and time series data, namely the period January 2018-September 2023. In the analysis of panel data models, three types of estimation approaches are known, namely the pooled least squares approach, the fixed effect approach, and the random effect approach. The main difference between FEM and REM lies in the treatment of intercepts. In FEM, each cross-section unit has its own fixed intercept value. While in REM, the intercept represents the average value of all cross-sectional intercepts and the error component represents the random deviation of individual intercepts from the average intercept value.

The hypothesis in this test is:

H0: Pooled Least Square (PLS)

H1: Fixed Effect Model (FEM)

The null hypothesis (H0) is rejected if the F statistic value is greater than the F table so that the appropriate model for panel

data regression is the Fixed Effect Model (FEM).

The Hausman test is used to determine the best model between the Fixed Effect Model (FEM) or the Random Effect Model (REM).

The hypothesis in this test is:

H0: Random Effect Model (REM)

H1: Fixed Effect Model (FEM)

The null hypothesis (H0) is rejected if the Haussman statistic value is greater than the chi-square statistic value or if the p-value is less than the α value. When the test result rejects H0, the most appropriate model to use is the Fixed Effect Model (FEM).

Model Feasibility Test

t-statistic test

Aims to see the effect of independent variables on dependent variables. The effect can be seen by comparing the t-count and t-table or by looking at the significance of each t-count. If the probability value is less than alpha 5%, there is an effect of the independent variable on the dependent variable.

F-statistic test

The F-test is intended to conduct a hypothesis test of the regression coefficient (slope) simultaneously, in other words it is used to ensure that the selected model is feasible or not to interpret the effect of independent variables on the dependent variable.

Coefficient of Determination (R2)

The value of the Coefficient of Determination reflects how much variation in the dependent variable can be explained by the independent variable. If the value of the Determination Coefficient is equal to 0, it means that the variation of the dependent variable cannot be explained by the independent variables at all. Meanwhile, if the value of the Determination Coefficient is equal to 1, it means that the variation of the dependent variable as a whole can be explained by the independent variables. Thus, the good or bad of a regression

equation is determined by R-squares which has a value between zero and one)

RESULTS AND DISCUSSION

In estimating the regression model using panel data, three approaches can be used, including the Pooled Least Square (PLS) model, the Fixed Effect Model (FEM) or the Random Effect Model (REM). Of the three regression models that can be used to estimate panel data, the best regression model is used in the analysis. To find out the best model to be used in the analysis, whether using the Pooled Least Square (PLS), Fixed Effect Model (FEM), or Random Effect Model (REM), testing is carried out using the chow test and the hausman test.

The Chow test is carried out to compare or choose which is the best between the pooled least square Model or the Fixed Effect Model. The results of the Chow test estimate show that the Probability (P) value for the cross section F. If the Prob F value < Alpha (5%) then the best model is the Fixed Effect Model.

Testing the Pooled Least Square Model or Fixed Effect Model:

Ho: model pooled

Ha: model fixed effect

The estimation results show that the Prob F value is 0.000 or Prob F < Alpha (5%), so reject Ho and accept Ha. So the best model used is the fixed effect model. Based on the results of the chow test, the test continues with the Hausman test.

Hausman test, is carried out to compare or choose the best model between the fixed effect model or random effect model. Fixed Effect Model or Random Effect Model Testing:

Ho: Random Model

Ha: Fixed effect model

The estimation results show that the Prob F value is 1.0000, meaning > Alpha (5%) so the model chosen is Random Effect.

LM test, to find out the Random Effect model is better than the Common Effect (OLS) method and is also used to ensure the results of Fixed Effect and Random Effect that are inconsistent in previous tests.

Ho: Common Effect Model

Ha: Random effect Model

The LM test results show Prob F < Alpha (5%) so the model chosen is Random Effect.

Panel Data Regression Hypothesis Test Results

Based on the results of the best model selection test, the best panel data linear regression analysis using the random effect model method.

The estimation results show that the macroeconomic variable of the rupiah exchange rate against the US dollar (NT) has a significant effect on the performance of protected mutual funds as measured by the Sharpe ratio. Meanwhile, the macroeconomic variables that do not have a significant effect on the performance of protected mutual funds are the interest rate (SBI) and inflation (INF) variables. The age and size of mutual funds have a significant effect on the performance of protected mutual funds. In addition to these independent variables, this study also uses

Moderator variables to see the interaction between the moderator variable and the predictor variable (independent). Moderator variables are variables that can strengthen or weaken the relationship between independent and dependent variables. The moderator variables of this study are the age and size of mutual funds. Based on the results of the panel data regression estimation presented in Table 3 above, it can be explained that the Bank Indonesia interest rate (SBI) variable does not have a significant effect on the performance of protected mutual funds. The rupee exchange rate against the US dollar (NT) has a positive and significant effect on hedge fund returns at a significance level of 1 percent and a coefficient value of 0.067981. These results indicate that for every rupee depreciated by one unit against the dollar, the hedge fund return increases by 0.067981. An increase in the value of a currency can weaken the performance of investment funds when converted into another country's

currency. This study is also supported by the research findings of Dima, Bogdani, Barna, Flavia, and Nachescu (2006) that the exchange rate affects the performance of mutual funds. The findings of Fajarwat and Abbas (2022), Akbar (2002), Mofleh Alshogeathri (2011) state that the exchange rate does not affect the performance of mutual funds. The inflation variable (INF) does not have a significant effect on the performance of mutual funds. hedge investment funds. The results show that changes in inflation do not affect mutual fund performance. Inflation spikes in Indonesia usually occur during crises and religious holidays, so inflation does not affect the overall performance of investment funds. Based on the results of the study, it can be said that inflation does not affect the performance of investment funds. A study conducted by Kumar and Dash found that mutual fund returns are very sensitive to inflation. Meanwhile, research by Elena and Alexandru (2011) in America showed a positive influence between inflation and investment funds. A study conducted by Shukla (2011) showed that there was a negative relationship between inflation and mutual fund returns. The mutual fund age variable (Age) has a positive and significant influence on the performance of protected mutual funds with a significance level of 5 percent and a coefficient value of 0.045801. These results show that every 1 day increase in the age of the mutual fund will increase the performance of the protected mutual fund by 0.045801. Research by Saurahman (2015) supports the results of this study which states that there is a positive influence of mutual fund age on mutual fund performance. Likewise, Blacke and Timmerman (1998) provide direct evidence that there is a positive relationship between age and mutual fund performance, this indicates economic experience.

The mutual fund size variable (Size) has a positive and significant effect on the performance of protected mutual funds with a significance level of 1 percent and a coefficient value of 0.924167. These results indicate that every 1 rupiah increase in the size of the mutual fund will increase the performance of the

protected mutual fund by 0.924167. The size of the Mutual Fund shows a high level of investor trust in the Mutual Fund so that it has great bargaining power to generate high profits. Philpot, James, Heart, Douglas, Rimbey, James N, and Schulman Craig T (1998) found that the size of the mutual fund has a positive effect on the performance of the mutual fund.

The moderator variable of the age of the mutual fund actually weakens the effect of the rupiah exchange rate against the US dollar on the performance of protected mutual funds with a coefficient value of -0.00000327 with a significance level of 5 percent. These results indicate that with a confidence level of 95 percent, the age of the mutual fund actually weakens the influence of the exchange rate against the US dollar on the performance of protected mutual funds by 0.00000327.

The moderator variable of the size of the mutual fund weakens the influence of the rupiah exchange rate against the US dollar (NT) on the performance of protected mutual funds with a coefficient value of -0.0000597 with a significance level of 1 percent. These results indicate that with a confidence level of 99 percent en mutual fund size weakens the influence of the exchange rate (NT) on the performance of protected mutual funds by 0.0000597.

Table 1: Data estimation results

Dependent Variable: YI				
Method: Panel EGLS (Cross-section random effects)				
Sample: 2018M01 2023M09				
Periods included: 69				
Cross-sections included: 32				
Total panel (unbalanced) observations: 2207				
Swamy and Arora estimator of component variances				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**prob.**

X1	-4,093972	7,419298	-0,551801	0,5811
Z1	0,045801	0,018013	2,542707	0,0111**
Z1X1	-0,001267	0,000785	-1,613724	0,1067
X2	0,067981	0,014565	4,667382	0,0000***
X3	26,23621	23,18230	1,131734	0,2579
Z1X2	-0,00000327	1,29E-06	-2,524459	0,0117**
Z1X3	0,001530	0,002358	0,649101	0,5163
Z2	0,924167	0,196742	4,697364	0,0000***
Z2X1	0,004665	0,007259	0,642677	0,5205
Z2X2	-0,0000597	1,42E-05	-4,216780	0,0000***
Z2X3	-0,025211	0,022545	-1,118239	0,2636
C	-1052,186	203,2271	-5,177389	0,0000***
Effects Specification				
			S.D	Rho
Cross-section random			13,48378	0,2571
Idiosyncratic random			22,91972	0,7429
		Weighted Statistics		
R-squared	0,057843	Mean dependent var		-3,07914
Adiusted R-squared	0,053122	S.D. dependent var		23,56938
S.E. of regression	22,93486	Sum squared resid		1154587.
F-statistic	12,25099	Durbin-Watson stat		1,75793
Prob(F-statistic)	0,00000			
		Unweighted Statistics		
R-squared	0,098041	Mean dependent var		-1.535.721
Sum squared resid	1578197.	Durbin-Watson stat		1.286.074

Sumber data: Peneliti

*p<0,1 **p<0,05 ***p<0,01

CONCLUSION

From the results of the analysis above, it can be concluded that several conclusions that can be drawn from the results of this study are as follows,

1. The macroeconomic variable of the rupiah exchange rate against the US dollar (NT) has a significant effect on the performance of protected mutual funds as measured by the Sharpe ratio. Meanwhile, the macroeconomic variables that do not have a significant effect on the performance of protected mutual funds are the interest rate (SBI) and inflation (INF) variables.

2. The age and size variables of mutual funds have a positive and significant effect on the performance of protected mutual funds.

3. The size of the mutual fund (Size) has a positive and significant effect on the performance of protected mutual funds with a significance level of 1 percent and a coefficient value of 0.924167.

4. The size of the mutual fund weakens the effect of the rupiah exchange rate against the US dollar (NT) on the performance of protected mutual funds with a coefficient value of -0.0000597 with a significance level of 1 percent.

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