

ANALYSIS OF THE PERFORMANCE OF INDONESIAN MUTUAL STOCK FUNDS USING SHARPE, TREYNOR, JENSEN AND M² METHOD PERIOD 2010 – 2019

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ABSTRACT

This study examines the performance of equity mutual funds using Sharpe, Treynor, Jensen, and M². The sample used in this study is 57 stock mutual funds in 2015 – 2019 and 29 stock mutual funds in 2010 – 2019. The performance of stock mutual funds will be compared with LQ – 45 and IHSG to find out whether they underperform or outperform on market performance. The results showed that when seen in years 2015 - 2019 with the benchmark LQ - 45, 11 equity funds outperformed by using Sharpe, Treynor, and M² and 12 mutual funds stocks outperformed by using a Jensen. Using the Composite Index as the benchmark, it is found that four equity funds outperformed by using Sharpe, M², and 5 equity funds outperformed by using Treynor and Jensen from 57 samples of mutual fund shares. From the performance of the year 2010 - 2019, it is found that the 10 equity funds outperformed by using Sharpe and M², and 15 equity funds outperformed by using Treynor and Jensen with LQ – 45 as the benchmark. The Composite Index found that 0 of stock mutual funds outperformed by using Sharpe and M² while 3 mutual funds outperformed using Treynor and 2 mutual funds outperformed using Jensen from 29 stock mutual funds samples.

Keywords: Stock mutual funds, Sharpe, Treynor, Jensen, M².

INTRODUCTION

Mutual funds are a practical investment place for investors who do not have the time and extensive knowledge of financial management in investment instruments (Subandi and Basana, 2020). Funds from investors will be collected and managed by investment managers in various investment places such as stocks, bonds, money markets, or a combination of investment instruments. (Mobius, 2007).

An assessment of mutual fund performance is important to do. By calculating the performance, one can see a mutual fund against other mutual funds. (Anindita, 2012). In assessing portfolio performance, it is better to use calculations that are already known as standard assessments. There are three commonly used risk-adjusted measurements calculations, namely Sharpe, Treynor, and Jensen. Sharpe and Treynor are the industry standard in calculating risk-adjusted returns (Kidd, 2011; Scholz & Wilkens, 2005).

Sharpe uses a total risk divisor or standard deviation. Treynor uses systematic risk as a divisor or commonly called beta. Jensen emphasizes the use of alpha, which highlights the difference between actual return and expected return. Jensen uses CAPM calculation by looking at beta and market risk premium. In 1997, Lairate Franco Modigliani and Leah Modigliani created a new M squared (M²) calculation that is attractive to investors. This calculation adjusts the risk of mutual funds with benchmark or market risk to measure returns (Onur, Ed, & Ajay, 2007).

The calculations of Sharpe, Treynor, Jensen, and M² can compare each portfolio of stocks with a benchmark and the value of the calculations will determine whether the portfolios are underperformed or outperformed. Suppose the difference between the performance of the stock mutual fund and the performance benchmark produces a positive value. In that case, it will outperform, and if it produces a negative value, it will underperform. Generally, IHSG and LQ 45 are often used as benchmarks for stock and often used as benchmarks for mutual funds by investment managers to manage stock mutual funds (Viena, 2013).

Investment Managers manage mutual funds, so it is expected that the return generated will be higher than the market returns because they have been managed by experienced investment managers

(Amalia & Zaenal, 1999). However, in previous studies, not all returns were mutually fundable to beat the market. Siahaan's (2006) research for the period 2001 – 2005 shows that out of 7 equity mutual funds, only 3 outperformed the Jensen method. A study on international mutual fund in United States period 1994 - 2003 by Onur, Ed & Ajay (2007) showed that by looking at the 5 years (1999-2003). The results are 49 mutual fund shares outperformed EAFE to see Sharpe, Treynor, and Jensen, and M^2 using the S&P500 benchmark, all mutual funds outperforming from 50 stock mutual funds samples. By evaluating 10 years, it was found that 20 mutual funds outperformed EAFE using Sharpe, Treynor, Jensen and M^2 . Besides that, using the benchmark S & P 500, only six mutual funds outperformed Sharpe and M^2 , and 9 funds by Treynor and Jensen that produce outperform value from 22 mutual funds sample.

LITERATURE REVIEW

Capital Market

The capital market is a market that brings together those who offer funds and those who need funds (Subandi and Basana, 2020). The capital market trades investment instruments such as stocks, mutual funds, bonds, and various derivative instruments (Darmadji & Fakhruddin, 2012).

Mutual Funds

According to the Capital Market Law No. 8 of 1995, mutual funds are a forum to collect investors' funds invested in securities portfolios by investment managers. Mutual funds come from the word "mutual," which means guard, and "fund," which means money, so that mutual funds are a collection of funds that are guarded (Susanto, 2008).

Portfolio Management Process

The portfolio management process according to (Reilly & Brown, 2006): The first step is to form a policy statement that contains specifications regarding acceptable risks, investment objectives, and investment limits. The second step is for investment managers to study and predict current financial conditions. The third step is to implement the portfolio considering the policy statement and predictions made previously. The last step is to provide feedback through monitoring. Considering the needs of investors and market conditions, the investment manager can update the policy statement.

Risk and Return

Risk and return are two characteristics of investment, so it is very important to know their origin. Factors that influence risk and return must be identified and evaluated (Sharpe, 1995). The expected rate of return is the expected by investors on their investment (Reilly & Brown, 2006). The investment will be more dangerous if there is a higher uncertainty than the outcome of the investment.

Return measurement can use the formula:

$$R_i = \frac{\frac{NAV_{unit}^t - NAV_{unit}^{t-1}}{NAV_{unit}^{t-1}}}{Unit^{t-1}} \quad (1)$$

Explanation:

R_i = Return of stock mutual fund

$\frac{NAV_{unit}^t}{unit}$ = Net Asset Value per Unit in period t

$\frac{NAV_{unit}^{t-1}}{unit}$ = Net Asset Value per Unit in period t – 1

Return from the market is calculated with the formula:

$$R_m = \frac{Market\ price\ t - Market\ price\ t-1}{Market\ price\ t-1} \quad (2)$$

Description:

R_m = Market return

share price t = The closing price of the market in period t

stock price t - 1 = The closing price of the market in period t - 1

The total risk or the standard deviation is the difference between the returns of actual and return expected (Tandelilin, 2010). Risk can be divided into two according to Fahmi (2012):

- Systematic risk: risk that cannot be eliminated or that affects the whole such as the 2008 monetary crisis.
- Unsystematic risk or beta: risk that only has an impact on related companies, for example, such as a company's capital structure and profits.

The standard deviation of each stock mutual fund can be calculated using the formula:

$$SD = \sqrt{\frac{(Ri - \underline{Ri})^2 + \dots + (Rn - \underline{Rn})^2}{n}} \quad (3)$$

Note:

- SD = Standard Deviation
 Ri = Return of mutual fund shares i
 \underline{Ri} = Average return of equity funds i
 n = total observation period

The systematic risk or beta can be measured by using the formula:

$$Beta = \frac{\sum_{t=1}^n (Ri - \underline{Ri}) \times (Rm - \underline{Rm})}{\sum_{t=1}^n (Rm - \underline{Rm})^2} \quad (4)$$

Explanation:

- Beta = Beta
 Ri = Return of stock mutual funds i
 \underline{Ri} = Average return of stock mutual funds i
 Rm = Daily market return
 \underline{Rm} = Average market return

Portfolio Performance

To find out whether a portfolio has a reasonable performance or not, a calculation must be done towards the portfolio performance (Fransisca & Malelak, 2020). Investors must be observant when considering the factors that affect portfolio performance (Suryawan, 2003). In calculating portfolio performance, an investor should not only look at the return but also to look at the risk. Three commonly used portfolio performance measurements include return and risk factors, namely Sharpe, Treynor, Jensen, and M².

Sharpe is a method of calculating portfolio performance using the standard deviation or total risk as a divisor. Sharpe's method uses the concept of Capital Market Line (CML) or Reward to Variability Ratio (RVAR) (Manurung, 2000). The more positive the Sharpe value, the better the portfolio performance is.

Sharpe's formula:

$$Sharpe = \frac{Ri - Rf}{SD} \quad (5)$$

Description:

- Sharpe = Sharpe
 \underline{Ri} = Average return of stock mutual funds
 Rf = Risk free
 SD = Standard deviation of stock mutual funds

Treynor is a portfolio performance calculation method that measures beta as a divisor. Treynor's method is known as the Reward to Volatility Ratio (RVOL). The calculation of portfolio performance using the Treynor method is based on the assumption that the portfolio is fully diversified, so the return obtained is the net portfolio return with risk-free interest rate per unit of market risk. The higher the RVOL value, the better the stock performance (Manurung, 2000).

Treynor formula:

$$Treynor = \frac{R_i - R_f}{Beta} \quad (6)$$

Description:

Treynor = Treynor

R_i = Average return of stock mutual funds

R_f = Risk free

Beta = Beta of stock mutual funds

Jensen is a portfolio performance calculation method that measures using ALPHA. Jensen is very concerned about CAPM in performance measurement. The intercept determines performance measurement. This method shows the difference between the rate of actual return and expected return. The higher and positive the Jensen value, the better the stock's performance is. (Manurung, 2000).

$$ALPHA = (R_i - R_f) - (Beta(R_m - R_f)) \quad (7)$$

Description:

ALPHA = Jensen

R_i = Average return of stock mutual funds

R_f = Risk free

R_m = Average market return

Beta = Stock mutual fund beta

M^2 is the development of Sharpe, created by Franco Modigliani and his granddaughter Leah Modigliani. This performance calculation includes elements of risk and returns benchmarks. The formula used is (Franco and Leah, 1997):

$$M^2 = \left(\frac{R_i - R_f}{SDI} \right) HR + R_f \quad (8)$$

Description:

M^2 = Ratio of M^2

R_i = Average return of equity funds

R_f = Risk Free

R_m = Average market return

SD_i = Standard deviation of stock mutual funds

SDM = Standard deviation of the market

Underperform or outperform.

To find out whether the measured portfolio performance reaches the target of investors, the stock portfolio's performance must be compared with the investor's benchmark target (Jogiyanto, 2010). If the stock performance is above the benchmark's performance, it will show an outperforming result. On the other hand, if the portfolio performance is below the benchmark's performance, it will show an underperforming result.

Market Index

The market index has five objectives, namely (IDX):

1. Measuring Market Sentiment
2. As a passive investment product and ETF and derivative product
3. Benchmark for active portfolios
4. Proxy for measuring returns, systematic risk, and risk-adjusted-performance
5. Proxy for asset class on asset allocation

Relationship Between Concepts

In calculating portfolio performance, investors must be observant when considering the factors that affect performance (Suryawan, 2003), so it is important to evaluate portfolio performance by looking at returns

and looking at risk-adjusted return. Some of the risk-adjusted measurements that are commonly used are Sharpe, Treynor, and Jensen. The third method considers a wide range of risks, with Sharpe using absolute risk or standard deviation as a divider, Treynor using systematic risk or beta as a divider, and Jensen using CAPM or ALPHA calculation basis looking at the beta and the market risk premium. Other performance calculations are M^2 for knowing the return obtained by adjusting the risk of stock mutual funds with market risk.

METHODOLOGY

Types of Research

The type of research carried out is quantitative, namely using data that can be calculated. The quantitative research method is systematic, planned, and structured from beginning to end (Sugiyono, 2013).

Population and Sample

The population in this study is all stock mutual funds in Bareksa. The sample of this research is stock mutual funds which are listed in Bareksa and have complete monthly data from 2010 – 2019 and 2015 - 2019.

Variable

1. Concept : Sharpe (RVAR)
Empirical Indicator: A measurement developed by William F. Sharpe using standard deviation and excess return to measure the return on each risk.
2. Concept : Treynor (RVOR)
Empirical Indicator: A measurement developed by Jack Treynor that uses excess return and beta to measure the return of each systematic risk.
3. Concept : Jensen (ALPHA)
Empirical Indicator: A measurement developed by Michael Jensen. This method shows the difference between the rate of actual return obtained from stock performance and the expected rate of return if the stock's performance is on the capital market line. The intercept determines the measurement of stock performance.
4. Concept : M^2
Empirical Indicator: A measurement developed by Franco Modigliani and his granddaughter Leah Modigliani. This measurement adjusts the risk of stock mutual funds with market risk to find *leverage* to maximize returns with a certain level of risk.

Data Analysis Techniques

- Calculating the risk-free rate with the formula:

$$Rf = \frac{\bar{Rf}}{N} \tag{9}$$

Description:

Rf = Risk Free

\bar{Rf} = Average risk free monthly

N = Data return period

- Calculating the monthly return of stock mutual funds for the period 2015 – 2019 using the formula (2.1) and the market (LQ-45 and JCI) using the formula (2.2), which is averaged annually with the formula:

$$\underline{Ri} = \frac{Ri1+Ri2+\dots+RiN}{N} \tag{10}$$

Information

\underline{Ri} = Average return

Ri = Monthly return

N = Data return period

- Calculating the standard deviation, Sharpe, Beta, Treynor, Jensen, and M^2 of each mutual fund shares and market a period of 5 and 10 years
- Calculate *leverage* using the formula:

ANALYSIS AND DISCUSSION

Overview of Object Research

From a population of 75 fund shares listed on the (Bareksa), it was found that stock mutual funds that have complete monthly data during the 2015 – 2019 period are 57 stock mutual funds and complete monthly data for the 2010 – 2019 period of 29 share mutual funds.

Research Results

Table 1. Five-Year Performance of Equity Funds (2015 – 2019)

Reksadana	Return	Alpha	Sharpe	Treynor	M^2
Sucorinvest Equity Fund	1,05%	0,008	0,242	0,013	1,08%
Shinhan Equity Growth	0,72%	0,005	0,149	0,011	0,70%
HPAM Ultima Ekuitas 1	0,69%	0,005	0,157	0,008	0,73%
Sucorinvest Maxi Fund	0,66%	0,005	0,148	0,011	0,70%
Simas Saham Unggulan	0,42%	0,002	0,075	0,005	0,40%
Rencana Cerdas	0,35%	0,001	0,077	0,003	0,41%
Mandiri Investa Equity ASEAN 5 Plus	0,35%	0,001	0,076	0,003	0,40%
TRAM Consumption Plus	0,34%	0,001	0,071	0,003	0,39%
Schroder Dana Prestasi	0,31%	0,001	0,070	0,003	0,38%
Schroder Dana Prestasi Plus	0,30%	0,001	0,064	0,003	0,36%
Batavia Dana Saham	0,29%	0,001	0,057	0,003	0,33%
Syailendra Equity Opportunity Fund	0,25%	0,000	0,042	0,002	0,27%
Prospera Bijak	0,24%	0,000	0,043	0,002	0,27%
Maybank Dana Ekuitas	0,23%	0,000	0,038	0,002	0,25%
Batavia Dana Saham Optimal	0,21%	0,000	0,034	0,002	0,23%
Danareksa Mawar Konsumer 10	0,20%	-0,001	0,028	0,001	0,21%
Eastspring Investments Value Discovery Kelas A	0,20%	-0,001	0,027	0,001	0,21%
TRIM Kapital	0,19%	0,000	0,028	0,001	0,21%
Schroder 90 Plus Equity Fund	0,18%	-0,001	0,026	0,001	0,20%
TRIM Syariah Saham	0,17%	0,000	0,023	0,001	0,19%
Principal Smart Equity Fund	0,15%	-0,001	0,017	0,001	0,17%
RHB Alpha Sector Rotation	0,15%	-0,001	0,016	0,001	0,16%
BNP Paribas Pesona	0,14%	-0,001	0,013	0,001	0,15%
Principal Total Return Equity Fund	0,12%	-0,001	0,006	0,000	0,12%
BNI-AM Inspiring Equity Fund	0,10%	-0,002	0,001	0,000	0,10%
Mandiri Investa Cerdas Bangsa	0,09%	-0,002	-0,002	0,000	0,09%
Avrist Equity - Cross Sectoral	0,08%	-0,002	-0,003	0,000	0,08%
BNP Paribas Ekuitas	0,08%	-0,002	-0,004	0,000	0,08%
Pratama Saham	0,07%	-0,003	-0,006	0,000	0,07%
Aberdeen Standard Indonesia Equity Fund	0,06%	-0,001	-0,011	-0,001	0,05%
TRAM Infrastructure Plus	0,06%	-0,002	-0,010	-0,001	0,06%
Schroder Dana Istimewa	0,06%	-0,002	-0,013	-0,001	0,05%
MNC Dana Ekuitas	0,05%	-0,002	-0,013	-0,001	0,04%
Bahana Dana Prima	0,05%	-0,002	-0,014	-0,001	0,04%
Batavia Dana Saham Syariah	0,04%	-0,002	-0,018	-0,001	0,02%
BNP Paribas Infrastruktur Plus	0,03%	-0,002	-0,016	-0,001	0,03%
Manulife Saham Andalan	0,03%	-0,003	-0,017	-0,001	0,03%
TRIM Kapital Plus	0,02%	-0,002	-0,021	-0,001	0,01%
BNP Paribas Pesona Syariah	0,01%	-0,002	-0,025	-0,001	-0,01%
BNP Paribas Solaris	0,00%	-0,003	-0,026	-0,001	0,01%
Manulife Dana Saham Kelas A	0,00%	-0,003	-0,027	-0,001	0,01%
Semesta Dana Saham	-0,01%	-0,003	-0,023	-0,001	0,00%
Manulife Syariah Sektoral Amanah Kelas A	-0,01%	-0,003	-0,030	-0,001	0,03%
Mega Asset Maxima	-0,01%	-0,003	-0,031	-0,001	0,03%

Reksadana	Return	Alpha	Sharpe	Treynor	M ²
Bahana Trailblazer Fund	-0,03%	-0,003	-0,034	-0,002	0,04%
Mandiri Investa Atraktif Syariah	-0,07%	-0,003	-0,049	-0,002	0,10%
MNC Dana Syariah Ekuitas	-0,08%	-0,003	-0,048	-0,002	0,10%
Simas Syariah Unggulan	-0,10%	-0,003	-0,041	-0,003	0,07%
Principal Indo Domestic Equity Fund	-0,12%	-0,004	-0,059	-0,003	0,14%
Pratama Syariah	-0,16%	-0,004	-0,059	-0,003	-0,14%
Mega Asset Greater Infrastructure	-0,17%	-0,004	-0,076	-0,003	0,22%
Cipta Syariah Equity	-0,19%	-0,004	-0,085	-0,004	0,25%
Avrist Equity - Amar Syariah	-0,22%	-0,005	-0,081	-0,004	0,24%
Principal Islamic Equity Growth Syariah	-0,27%	-0,005	-0,105	-0,005	0,33%
Manulife Saham SMC Plus	-0,33%	-0,006	-0,089	-0,005	0,27%
Narada Saham Indonesia	-0,54%	-0,008	-0,072	-0,007	0,20%
HPAM Syariah Ekuitas	-0,56%	-0,008	-0,114	-0,009	0,37%
IHSG	0,36%	0,000	0,084	0,003	0,36%
LQ 45	0,31%	0,000	0,053	0,002	0,31%
Risk Free	0,10%				

Table 2. Performance of Mutual Fund Shares Ten years (2010-2019)

Reksadana	Return	Alpha	Sharpe	Treynor	M ²
Schroder Dana Prestasi	0,85%	0,0024	0,1982	0,009	0,91%
MNC Dana Ekuitas	0,84%	0,005	0,1916	0,0162	0,88%
Syailendra Equity Opportunity Fund	0,83%	0,0018	0,1724	0,0083	0,80%
Batavia Dana Saham Optimal	0,80%	0,0017	0,1748	0,0081	0,81%
TRIM Kapital	0,78%	0,0014	0,1599	0,0078	0,74%
Pratama Saham	0,76%	-0,0003	0,1246	0,0062	0,59%
Rencana Cerdas	0,75%	0,0011	0,1611	0,0075	0,75%
TRIM Syariah Saham	0,73%	0,0011	0,1538	0,0075	0,72%
Batavia Dana Saham	0,72%	0,0009	0,1606	0,0073	0,75%
TRIM Kapital Plus	0,70%	0,0004	0,1312	0,0068	0,62%
Schroder Dana Istimewa	0,68%	0,0006	0,1486	0,007	0,69%
Maybank Dana Ekuitas	0,68%	0,0003	0,1408	0,0066	0,66%
Schroder Dana Prestasi Plus	0,67%	0,0006	0,1565	0,007	0,73%
BNP Paribas Pesona Syariah	0,66%	0,0005	0,1459	0,0069	0,68%
BNP Paribas Pesona	0,66%	0,0001	0,1461	0,0065	0,68%
BNP Paribas Solaris	0,63%	-0,0002	0,1263	0,0062	0,60%
BNP Paribas Ekuitas	0,62%	-0,0005	0,1322	0,0059	0,62%
BNP Paribas Infrastruktur Plus	0,62%	-0,0007	0,1262	0,0057	0,60%
Cipta Syariah Equity	0,59%	0,0002	0,131	0,0065	0,62%
Manulife Saham Andalan	0,55%	-0,0012	0,1115	0,0052	0,53%
Manulife Syariah Sektorial Amanah Kelas A	0,54%	-0,0005	0,1202	0,0057	0,57%
Bahana Dana Prima	0,52%	-0,0015	0,1066	0,0048	0,51%
Principal Total Return Equity Fund	0,51%	-0,0013	0,1065	0,0049	0,51%
Manulife Dana Saham Kelas A	0,51%	-0,0012	0,1123	0,005	0,54%
Batavia Dana Saham Syariah	0,50%	-0,0008	0,1062	0,0053	0,51%
Aberdeen Standard Indonesia Equity Fund	0,48%	-0,001	0,11	0,0051	0,53%
Mandiri Investa Cerdas Bangsa	0,45%	-0,002	0,0902	0,0042	0,44%
Principal Islamic Equity Growth Syariah	0,30%	-0,0029	0,0612	0,0029	0,32%
Mandiri Investa Atraktif Syariah	0,29%	-0,003	0,0579	0,0028	0,30%
IHSG	0,84%	0	0,2025	0,0079	0,84%
LQ45	0,69%	0	0,1472	0,0064	0,69%
Risk Free	0,05%				

Outperforming and underperforming stock mutual funds are based on Sharpe, Treynor, and Jensen for 5 years with the LQ – 45 as the benchmark. According to Sharpe's calculations, 11 mutual funds outperformed because they have a Sharpe value above the benchmark. Using Jensen's calculation, it was found that 12 mutual fund stocks can outperform and using Treynor with consideration of beta or market risk, it was found that 11 stock mutual funds managed to outperform against the benchmark (LQ 45). The 12 stock mutual funds that managed to outperform Sharpe, Treynor, and Jensen were the same, but using Jensen's calculations, an additional Prospera Bijak outperformed.

Outperform and underperform of equity mutual funds based on Sharpe, Treynor, Jensen, and M^2 from 2015 – 2019 with benchmark IHSG. According to the calculations, Sharpe and M^2 reveal that four mutual funds stocks outperformed as it has Sharpe values above the benchmark. Using a calculation, Jensen found that 5 equity funds can outperform. Treynor also found five equity funds managed to outperform against the benchmark (IHSG).

Outperforming and underperforming of stock mutual funds performance are based on Sharpe, Treynor, and Jensen for a period of 10 years with LQ – 45 as the benchmark. Sharpe's calculation shows that 10 stock mutual funds outperformed because they have a Sharpe value above the benchmark. Using Jensen's calculation, it is found that 15 stock mutual funds can outperform and using Treynor with beta or market risk considerations, it was found that 15 mutual funds managed to outperform against the benchmark (LQ 45) of 29 mutual funds that have a complete monthly data for 10 years.

The benchmark stock index has a number of stock mutual funds that outperformed lower on the calculation of Sharpe, Treynor, Jensen, and M^2 . The least number of stock mutual funds that outperform on the IHSG is because the IHSG has returned a high of 0.84%, compared to LQ - 45, which is only 0.69%. Sharpe JCI is also higher with a value of 0.2025 compared to LQ - 45 which has a value of 0.1472 and higher Treynor also have a value of 0.0079, while LQ - 45 only has a Treynor value of 0.0064.

CONCLUSION AND RECOMMENDATIONS

Conclusion

In the 5-year research period, it was found that 32 stock mutual funds had average monthly returns lower than the average risk-free rate, resulting in a negative excess return. A 10-year study shows that all stock mutual funds have a monthly average return that is higher than the risk-free rate.

Recommendation

1. Further researchers can add other calculation methods such as information ratio so that it can be considered in evaluating the performance of stock mutual funds in Indonesia.
2. Further researchers can use *benchmarks* such as the *Jakarta Islamic Index (JII)* or *KOMPAS 100* to produce different assessments for comparison in evaluating the performance of stock mutual funds in Indonesia.

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