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Effect of Mutual Fund Fundamentals and Characteristics on Their Performance: An Empirical Study of Thai Equity Mutual Funds

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Keywords: Mutual Funds, Performance, Fund Fundamentals, Fund Characteristics.

Abstract: As equities mutual funds are a popular option among investors, it is advantageous to discover performance factors. This analysis incorporates fund fundamentals, features, and external factors as determinants. The objective is to analyze the impact of such factors on the performance of equities mutual funds in Thailand. Return and risk-adjusted performance metrics like the Sharpe ratio, Treynor ratio, and Jensen's alpha are used to evaluate performance. Between 2016 and 2020, 216 equity mutual funds were chosen using a random sample. To examine the effect, multiple linear regression is used. The results demonstrate that liquidity and volatility are detrimental to return. The effects of fund age, market return, and consumer price index change on risk-adjusted performance are negative. Return, and Sharpe ratio are positively affected by GDP. Money supply influences return, Sharpe ratio, and Jensen's alpha positively. The effect of asset turnover, equity debt, return on equity, management fees, the unit trust sold, and fund size is insignificant. The study supports risk-adjusted performance because the effects are instantaneous and need no lag time.

1. Introduction

A mutual fund is one of the most popular financial market investment options for both small and large participants (US Securities and Exchange Commission). It is a unit trust that combines the funds of numerous participants and invests them in securities, including stocks, bonds, and short-term debt (US Securities and Exchange Commission). Diversification, expert management by the fund managers, liquidity, a choice of options according to the investor's interests, covariances, lower costs, the ability to participate, and government control are visible benefits of investing through mutual funds. Mutual funds have experienced significant expansion. The market size for worldwide mutual fund assets was valued at $ 54.93 trillion in 2019 and is predicted to reach $ 101.20 trillion by 2027, expanding at an 11.3% CAGR from 2020 to 2027. (Allied Market Research, 2021). In terms of their respective categories, equity funds held the biggest market share in 2019. Their primary investments classified 56% of mutual funds as stock or equity funds. The fund's popularity has expanded in both established and emerging economies. In the Thai capital market, the net asset values of mutual funds reached 5,389,707 million baht in 2019. (Association of Investment Management Companies, 2021). Despite the widespread disruption caused by COVID-19, the average 10-year growth rate for Thai mutual funds was around 11.60 percent between 2009 and 2019.

Similarly to global funds, equities mutual funds are the most popular among investors, as evidenced by the highest number of fund offerings (762 from 1,363 mutual funds investing in Thailand as of 2021). Unlike any other assets, mutual fund investments are susceptible to losses despite their various advantages and development potential. Consequently, identifying mutual fund performance determinants is of great interest to academics, investors, and related parties. According to prior research on the factors that influence the performance of mutual funds, macroeconomic and fund-specific variables effectively predict their performance. As for fund fundamentals, liquidity and asset turnover have been demonstrated to positively impact performance (Afza et al., 2009; Carhart, 1997). In addition, Sukkasame (2021) find that liquidity has a beneficial influence, whereas turnover has a negative effect. While Rehman et al. (2016) demonstrate the detrimental impact of liquidity, asset rotation has a favorable impact. Regarding return on equity, Budiono et al. (2010) and (Rongngern, 2016) are cited. Panuvisitsang (2016) identify a beneficial impact on the performance of funds. In the meantime, Sukkasame (2021) reveal a negligible effect.

Regarding mutual fund features, management charge is highlighted as a performance-influencing component. A high management charge is believed to foster conflict between the board of a mutual fund and asset management. Consequently, expenses harm fund performance (Freeman et al., 2000; Rehman et al., 2016). Conversely, there are positive impacts (Afza et al., 2009; J. Chen et al., 2004; Gallagher, 2003; Nazir et al., 2010; Pushner et al., 2001). The explanation is that high expenses indicate efficient management, which has a beneficial effect on performance. In addition, (Ferreira et al., 2012) suggest that fees are viewed as the amount uneducated investors pay to managers in exchange for investment advice. When investors pay greater fees, they pay for the associated perks and receive superior results (Ferreira et al., 2012). Nevertheless, the expenditure ratio does not affect fund performance (Białkowski et al., 2011). Age is the next attribute of a fund. Numerous investigations have found a correlation between fund age and performance (Afza et al., 2009; Kiymaz et al., 2017; Otten et al., 2002). Such a beneficial relationship may be the result of management expertise. In contrast, there is evidence that fund age negatively affects performance (Ferreira et al., 2012; Sukkasame, 2021). This inverse correlation results from high trade costs and dwindling rewards (Berk et al., 2004). In addition, (Webster, 2002) and Maroof et al. (2020) find no correlation between fund age and performance in timing selectivity. Regarding fund size, Graham et al. (2020), Perold et al. (1991), Prasomsak (2001), J. Chen et al. (2004), and Yan (2008) establish a detrimental influence of fund size 2008. Liang (1999), Margaritis et al. (2007), and Rehman and Baloch (2016), in contrast, assert its favorable influence. In addition, Gusni et al. (2018) reported a negligible effect. Large funds negatively influence performance because of cost, liquidity, pricing impact, and organizational inefficiencies Perold et al. (1991). According to Gusni et al. (2018). The bigger fund size has a favorable effect due to economies of scale and a decrease in marginal cost. Nonetheless, such economies of scale may increase the possibility of agency problems (Nguyen et al., 2018). Therefore, fund size has a detrimental impact on performance. As stated previously, the performance factors of mutual funds are inconclusive. Diverse studies exist about the effect of factors on their performance.

There are also diverse perspectives regarding plausible explanations. Existing research does not identify specific performance-affecting factors. In addition, previous research has concentrated on macroeconomic or country-level causes rather than fund-specific characteristics. In addition, comparative analysis typically employs return rather than risk-adjusted return to quantify performance. Even though numerous research on mutual fund performance has been undertaken, most focus on developed markets such as the United States, the United Kingdom, and the European Union (Nguyen et al., 2018). For emerging markets such as the Thai capital market, there are not many relevant studies. Therefore, it is still advantageous to investigate the factors influencing mutual fund performance in the Thai capital market. This study analyzes the factors influencing the performance of equities mutual funds in Thailand. Fund-specific fundamentals and characteristics are investigated. As they affect performance, macroeconomic and external factors are also considered. The findings will contribute to understanding variables that explain mutual fund performance and provide academics, investors, and others with useful insight.

2. Literature review

A vast body of literature studies the factors that affect mutual fund performance. Angelidis et al. (2013) propose the probable fund performance drivers of board size, fund age, fees, and expenses. Macroeconomic and fund-level variables are also recommended as indicators of fund performance in terms of market outperformance (Banegas et al., 2013). Afza et al. (2009) and Nazir et al. (2010) contend that liquidity harms fund performance. As for the turnover ratio, Pástor et al. (2015) and (Wermers, 2000) demonstrate a positive correlation with fund performance. In contrast, Carhart (1997), Y. Chen et al. (2007), Afza et al. (2009), Nguyen et al. (2018), and Maftukhah (2020) report a negative association. According to Nguyen et al. (2018), this inverse association indicates a reflexive technique employed by fund managers. Fama (1972) imply that the change in the risk level of managed portfolios in anticipation of market pricing conditions can be used to improve portfolio performance. Documentation demonstrates a negative link between expenditure ratio and fund performance (Carhart, 1997; Gil-Bazo et al., 2009; Maftukhah, 2020; Otten et al., 2002). In contrast, such expenses benefit the fund's return (Afza et al., 2009; Droms et al., 1996; Ippolito, 1989; Nazir et al., 2010). One of the elements determining mutual fund

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performance is the management charge. There is evidence of a positive impact on fund performance (Gallagher, 2003). On the contrary, unfavorable effects are documented (Afza et al., 2009; J. Chen et al., 2004; Gallagher, 2003; Nazir et al., 2010; Pushner et al., 2001). The age of a mutual fund also influences its performance. A positive correlation between age and the performance of a fund is demonstrated (Afza et al., 2009; Ferreira et al., 2012; Kiymaz et al., 2017; Otten et al., 2002). On the other side, it is believed that there is a negative correlation between fund age and performance (Berk et al., 2004; Pástor et al., 2015). This is the result of high trade expenses and decreasing returns. In addition, Howell (2001) reports that the median return of the youngest funds is approximately double that of all funds. According to the fund size, Ferreira et al. (2012) demonstrate that larger funds tend to perform better, which suggests economies of scale. In addition, the performance of funds with greater fees is superior. Next, Margaritis et al. (2007) illustrate the positive influence of fund size due to economies of scale. Such a correlation between size and performance is also observed for US and European funds Graham et al. (2020). Sirri et al. (1998), on the other hand, state that managerial compensation is proportional to fund size.

This increases the possibility of an agency problem Ferreira et al. (2012). Consequently, the effect on fund performance is negative. Another explanation for the negative impact is that greater fund sizes will have a lower risk than small ones (Elton et al., 2009). Low-risk results in a modest projected return. In addition, Perold et al. (1991) stated that the performance of large mutual funds is negatively affected by cost, liquidity, and price impact. This detrimental effect is documented by (Berk et al., 2004; J. Chen et al., 2004; Grinblatt et al., 1989; Nguyen et al., 2018; Perold et al., 1991; Yan, 2008). In addition, research by Clark (2003), Gregoriou et al. (2002), (Webster, 2002), Białkowski et al. (2011), and Gusni et al. (2018) reveals that fund size has no substantial impact on the performance of equities mutual funds. Rehman et al. (2016) explore the Pakistani mutual fund performance influencing elements regarding the emerging market study. They discover that fund size, expense ratio, management fee, and asset turnover contribute positively to fund return.

In contrast, liquidity has a negative effect. In addition, Maroof et al. (2020) investigate the relationship between fund characteristics and timing abilities in the Pakistani mutual fund industry. They report that funds with greater market exposure exhibit superior market timing and volatility timing abilities but inferior selectivity timing abilities. This study determines the impact of fund size, expense ratio, and turnover ratio. Vietnamese capital market research is another study of an emerging market. Nguyen et al. (2018) investigate the factors of mutual fund performance in Vietnam at both the country and fund levels. The research reveals a positive correlation between macroeconomics and the implementation of mutual funds. Additionally, country-level factors such as regulation, efficiency, political stability, economic growth, and financial development favor mutual fund success. The influence of fund-level elements varies. There is no substantial relationship between board size and the performance of mutual funds. In Vietnam, however, passive funds perform better than active funds.

Their finding aligns with Malkiel (2003)'s and Crane et al. (2018). According to their findings, passive funds beat active funds. There is evidence. However, that passive and active mutual funds are not materially distinct (Nguyen et al., 2018). Regarding the research on mutual fund performance in Thailand, Prasomsak (2001) studies the influence of equity fund return variables throughout recession periods. The study reveals that fund returns are positively connected with market

returns and inversely correlated with fund size and equity turnover. (Mangkang, 2006) found that the growth ratio of fund size and fund size managed by the same business, operational years, and risk affect the return of equity-security funds. In contrast, management fee negatively affects the return of debt-security funds. Laiwattanachai (2017) indicates that unit trusts and the SET 100 index positively link with the net asset value (NAV) of equity funds. In contrast, the 1-year fixed interest rate has an inverse relationship. The SET index and the inflation rate have no statistical relationship with stock fund NAV. Sriphatthanapibool (2016) reveals that the SET index and inflation rate positively affect the return on equity funds. However, the 3-month fixed deposit rate has a negative correlation.

In addition, Laiwattanachai (2017) investigates the factors influencing large-cap funds' Net Asset Value (NAV). According to the study, the SET and the Private Investment Index impact NAV, although the CPI and the 1-year deposit interest rate do not. In addition, Meesilp et al. (2022) demonstrates that only systematic risk is associated with the rate of return on equities funds and exchange-traded funds (ETFs), whereas money supply does not correlate. In addition, Tangkittiwet (2018) demonstrates that the Consumer Price Index (CPI) and the Private Investment Index (PII) influence the NAV of small- to mid-cap funds, although the SET index and the 1-year deposit interest rate do not.

Kludcharoen (2021) also document the impact of macroeconomic and exogenous variables. They reveal that the CPI, Private Investment Index (PII), and interest rate affect the NAV of equity mutual funds, whereas the GDP and exchange rate do not. As for the effect of fund fundamentals and features, Sukkasame (2021) identify working capital to total asset ratio and Gross Domestic Product (GDP) growth as favorable influencing elements of return on investment in equity mutual funds. The negative affecting variables are standard deviation, asset turnover, and fund maturity. In addition, return on equity is not identified as a factor. The result contradicts the findings of Budiono et al. (2010), Phakularn (2015), and Rongngern (2016), who imply that return on equity is a positive influence.

The notion and prior findings offer the following hypotheses that can be tested:

H1 Liquidity has a negative effect on mutual fund performance.

H2 Leverage has a negative effect on mutual fund performance.

H3 turnover has a positive effect on mutual fund performance.

H4 Return on equity has a positive effect on mutual fund performance.

H5 volatility has a negative effect on mutual fund performance.

H6 Management fee has a positive effect on mutual fund performance.

H7 Fund age has a negative effect on mutual fund performance.

H8 Fund unit trust sold has a positive effect on mutual fund performance.

H9 Fund size has a positive effect on mutual fund performance.

H10 Consumer price change has a negative effect on mutual fund performance.

H11 Economic development measured by GDP growth positively affects mutual fund performance.

H12 Market return has a positive effect on mutual fund performance.

H13 Exchange rate of USD1/Baht negatively affects mutual fund performance.

H14 Money supply has a positive effect on mutual fund performance.

3. Research Methodology

3.1 Sample and Data

The population of this study consists of 674 equity mutual funds in Thailand (as of December 3, 2020). To select the sample, purposeful sampling is used. Equity mutual funds that have continuously existed during the five-year study period constitute the sampling criterion. This amount of money equals 274. In addition, fundamental and characteristic data must be accessible for financing. According to the sampling criteria, the number of sampled funds remains at 216. Therefore, there are 1,080 observations in the data set. For this investigation, secondary data is collected. The websites of fund asset management, annual reports, and the Securities and Exchange Commission (SEC) provide the data for fund attributes (net asset value, fund fundamentals, and characteristics). The external factor and risk-free rate are acquired from the website of the Bank of Thailand. The website of the Stock Exchange of Thailand provides the SET index.

3.2 Model Specification

For equity mutual fund returns, daily Net Asset Value (NAV) is used to calculate return as;

$$R_{pt} = \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}}$$

R_{pt} represents mutual fund return at day t.

NAV_t represents NAV of the fund at day t.

The market index return (R_m) is proxied by the Stock Exchange of Thailand Index (SET) change. In addition, the risk-free asset (R_f) is proxied by a 1-year treasury bill return. Four measures are used to evaluate mutual fund performance: Return, Sharpe's Index, Treynor's Index, and Jensen's Alpha. Sharpe, Treynor, and Jensen's Alpha are risk-adjusted performance as follows;

$$Sharpe = \frac{(R_p - R_f)}{\sigma_p}$$

$$Treynor = \frac{(R_p - R_f)}{\beta_p}$$

$$Jensen's\ alpha = (R_p - R_f) - (R_m - R_f)\beta_p$$

Where $R_p - R_f$ represents the excess return above the risk-free return. σ_p measures the total risk of the fund, whereas ß represents its systematic risk. The Sharpe's Index measures the ability to earn excess return per unit of total risk. The Treynor's Index measures excess return per one unit of systematic risk. Moreover, Jensen's Alpha is the risk-adjusted excess or abnormal return superior to or below the normal or expected return. Financial ratios representing liquidity, leverage, efficiency, and profitability are applied to the fund fundamentals. Risk, management fees, age, unit trust sold, and size are examined for the fund characteristics. Since macroeconomics and other external factors affect fund performance, seven-factor are included as control variables. All explanatory variables have been mentioned in table1.

Table 1: Variables and Definitions

Variables	Symbols	Definitions
Fundamentals		
- Current ratio	CR	Measures liquidity; Current Asset/current Liability.
- Debt to Equity ratio	DE	Measures leverage; Total liabilities/equity.
- Total Asset Turnover ratio	TAT	Measure efficiency; Total revenue/total asset.
- Return On Equity	ROE	Measure profitability; Net income/equity.
Characteristics		
- Risk	RISK	Volatility of return measured by standard deviation.
- Fees	FEE	Fund management fees to the net asset value.
- Time	TIME	Fund age (From establishment to the end of the fiscal year)
- Quantity	QUANTI	Fund unit trust sold at the end of the fiscal year.
- Size	SIZE	Net asset value (NAV) at the end of the fiscal year.
External Factors		
- Consumer Price Index	CPI	Consumer price index change.
- Private Investment Index	PII	Private investment index change.
- Gross Domestic Product	GDP	Gross domestic product change.
- The Stock Exchange of Thailand Index	SET	The Stock Exchange of Thailand Index change; Proxied of the Market Index.
- Exchange Rate	EX	Average exchange rate of USD1/baht.
- Interest	INT	Average deposit interest rate.
- Money Supply	M2	Money supply, each, checking deposits and easily-convertible near money (The Investopedia team, 2022)

The multiple linear regression method is analyzed to investigate the impact of the fund fundamentals and characteristics on their performance. Before constructing the model, the classical assumption underlying regression, namely multicollinearity, heteroskedasticity, and autocorrelation, is examined. When the test results show that the data meet the assumption, multiple linear regression are further conducted as follows;

3.3 Return Performance

$R_{pt} = \alpha_1 + \beta_1\ CR_t + \beta_2\ DE_t + \beta_3\ TAT_t + \beta_4\ ROE_t + \beta_5\ RISK_t + \beta_6\ FEE_t + \beta_7\ TIME_t + \beta_8\ QUANTI_t + \beta_9\ SIZE_t + \beta_{10}\ CPI_t + \beta_{11}\ GDP_t + \beta_{12}\ SET_t + \beta_{13}\ EX_t + \beta_{14}\ M2_t + \varepsilon_t$ (1)

3.4 Risk – adjusted Performance

$SHARPE_t = \alpha_1 + \beta_1\ CR_t + \beta_2\ DE_t + \beta_3\ TAT_t + \beta_4\ ROE_t + \beta_5\ RISK_t + \beta_6\ FEE_t + \beta_7\ TIME_t + \beta_8\ QUANTI_t + \beta_9\ SIZE_t + \beta_{10}\ CPI_t + \beta_{11}\ GDP_t + \beta_{12}\ SET_t + \beta_{13}\ EX_t + \beta_{14}\ M2_t + \varepsilon_t$ (2)

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$$TREYNOR_t = \alpha_1 + \beta_1 CR_t + \beta_2 DE_t + \beta_3 TAT_t + \beta_4 ROE_t + \beta_5 RISK_t + \beta_6 FEE_t + \beta_7 TIME_t + \beta_8 QUANTI_t + \beta_9 SIZE_t + \beta_{10} CPI_t + \beta_{11} GDP_t + \beta_{12} SET_t + \beta_{13} EX_t + \beta_{14} M2_t + \varepsilon_t \quad (3)$$

$$JENSEN_t = \alpha_1 + \beta_1 CR_t + \beta_2 DE_t + \beta_3 TAT_t + \beta_4 ROE_t + \beta_5 RISK_t + \beta_6 FEE_t + \beta_7 TIME_t + \beta_8 QUANTI_t + \beta_9 SIZE_t + \beta_{10} CPI_t + \beta_{11} GDP_t + \beta_{12} SET_t + \beta_{13} EX_t + \beta_{14} M2_t + \varepsilon_t \quad (4)$$

The t-test is used to determine whether the explanatory variable affects the fund performance. It is noted that β_1 to β_4, β_5 to β_9, and β_{10} to β_{14} determine the effect of fund fundamentals, characteristics, and macroeconomic and external factors, respectively. However, explanatory variables are reduced or adjusted to remedy the underlying assumptions.

4. Empirical Results

4.1 Descriptive Statistics

Table 1 summarizes descriptive information regarding the fundamentals, characteristics, and performances of sample equity mutual fund samples. The current ratio assessed the average liquidity value during the past five years is 154.6668 since most of the present asset consists of marketable securities. This is customary for mutual funds. The average debt-to-equity ratios, total asset turnover, and return on equity for the past five years are 0.0294, 0.6811, and 0.0096, respectively.

The fund's volatility, as measured by standard deviation, is 0.2138. 2.859% of Net Asset Value is attributable to management fees (NAV). The average age of a fund is 9.3550 years old. In addition, the average unit trust offered consists of 4.57 million units with a Net Asset Value (NAV) of 38.90 million Thai Baht. External economic forces exhibit low or negative growth rates. The average return on the market is negative. During the study period, the baht-to-dollar exchange rate increased by 2%. The average money supply is 94,3 million baht.

Regarding fund performance, the average yearly return is 0.507 percent. Sharpe and Treynor ratios average 0.0169 and 0.0006, respectively. The average Jensen's alpha is 0.0001. Due to the coronavirus, these data indicate that the average external factors will be unfavorable in 2019 and 2020. As a result of the coronavirus during the study period, the average performance of the funds utilized as samples demonstrates a lackluster performance.

Table 2: Descriptive Statistics Result (For 5-year study period)

Variables	Mean	Max	Min	Std. Dev.
Fundamentals				
- CR	154.6668	5645.8360	0.7319	200.8649
- DE	0.0294	2.9649	0.0002	0.0560
- TAT	0.6811	38.5701	0.0001	1.0454
- ROE	0.0096	0.5475	-0.8006	0.0018
Characteristics				
- RISK	0.2138	5.5687	0.0044	0.2278
- FEE	0.2859	1.6700	0.0003	0.0334
- TIME	9.3550	28.1205	0.1000	6.2327
- QUANTI	4.57E+08	1.15E+11	87245	3.00E+09
- SIZE	3.89E+09	1.17E+12	3.95E+06	1.79E+10
External Factors				
- CPI	0.0035	0.0107	-0.0085	1.00E-17
- PII	0.0146	0.0292	-0.0049	1.39E-17
- GDP	-0.0316	-0.0180	-0.0610	6.26E-17
- SET	-0.0110	0.1400	-0.1100	0.1107
- EX	-0.0294	0.0080	-0.0480	0.0253
- INT	0.0120	0.0140	0.0048	2.78E-17
- M2	9.43E+08	6.20E+09	1.80E+07	5.42E+08

Performances (Annual Based)				
- Return	0.5070	1.0016	-0.3639	0.0330
- Sharpe	0.0169	0.2213	-0.1858	0.0014
- Treynor	0.0006	0.1411	-0.0393	0.0002
- Jensen's alpha	0.0001	0.0015	-0.0018	0.0000

5. Regression Results

Using Variance Inflation Factors, the extreme correlation among independent variables is studied in light of classical assumptions (VIFs). The highly correlated variable with VIFs or limited tolerances is eliminated using the entry procedure. Consequently, the remaining explanatory factors confirm the absence of a multicollinearity issue. As demonstrated in Table 2, the resultant VIFs are under 10. According to diagnostics for collinearity, Private Investment Index and interest rate are eliminated. Consequently, the model's predictors consist of four fundamentals, five features, and five external factors. Figure 1-4 depicts the variance for the heteroskedasticity evaluated using the standardized predicted value scatterplot. These standardized predicted values of the risk-adjusted performance-Sharpe ratio, Treynor ratio, and Jensen's alpha appear scattered or static, indicating stationary variance. As the expected return value's standard deviation is not zero, AR (1) and AR(2) are used as a remedy. Durbin-Watson suggests no autocorrelation problem because all Durbin-Watson values are between 1.50 and 2.50. (Vanichbuncha, 2017). Sharpe, Treynor, and Jensen's alphas for the AR (2) Durbin-Watson are 1.966, 1.941, 2.044, and 2.259, respectively.

All performance indicators - return, Sharpe ratio, Treynor ratio, and Jensen's alpha - are regressed against predictors to determine the effect of fund fundamentals and features on their performances. Taking performance in terms of return into account, AR (1) is used to solve non-stationary problems. As Durbin-Watson is displayed as 0.503, AR (2) is applied further. The following are the findings:

As seen in table 4, the current ratio has a large negative effect on return. There is also a major negative influence of a fund's volatility or risk on its performance.

Conversely, macroeconomic parameters such as CPI, GDP, and M2 are believed to have large beneficial effects. These results only demonstrate that return is proportional to macroeconomic factors, as they have the greatest impact on return. Other fund metrics, such as debt-to-equity ratio, total asset turnover, and return on equity, have no effect. Other fund parameters, such as the management fee, age, number of units sold, and size, have no impact on the fund's return. The significance of the F-statistic is underlined. Durbin-Watson is 1.966, indicating that there is no autocorrelation issue.

Table 3: Multicollinearity Test

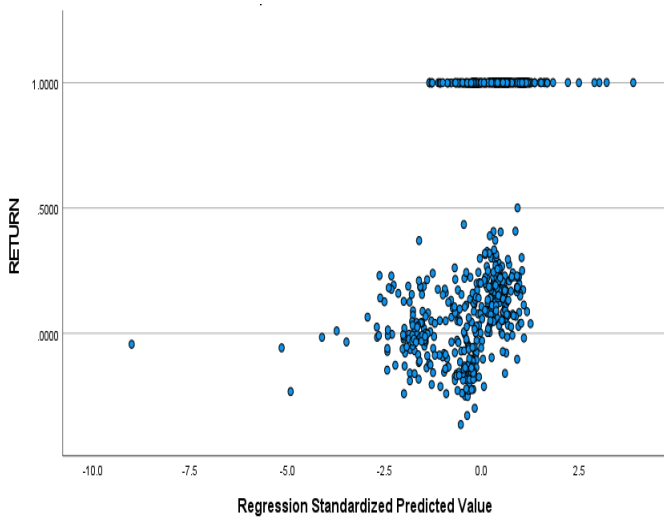| Variables	VIF Test
Fundamentals	
CR	1.041
DE	1.123
TAT	1.020
ROE	1.106
Characteristics	
RISK	1.047
FEES	1.018
TIME	1.079
QUANTITY	1.029
SIZE	1.033
External Factors	
CPI	1.535
GPD	1.544
SET	1.781
EX	3.403
M2	3.281

5.1 Heteroskedasticity Test

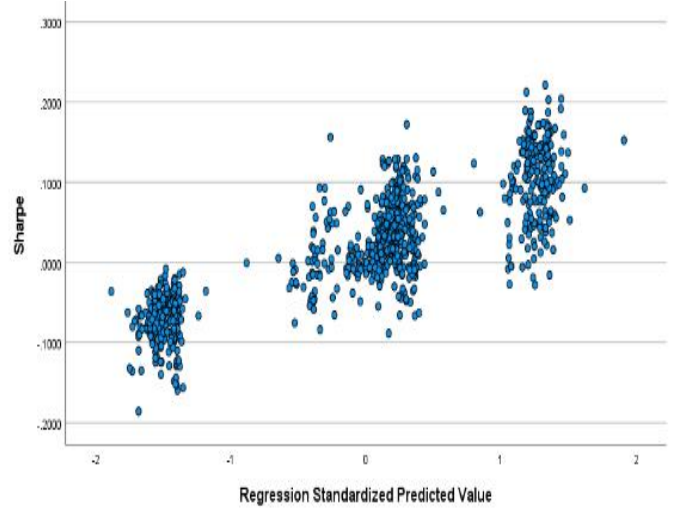Figure 1: Regression Standardized Predicted Value of Return

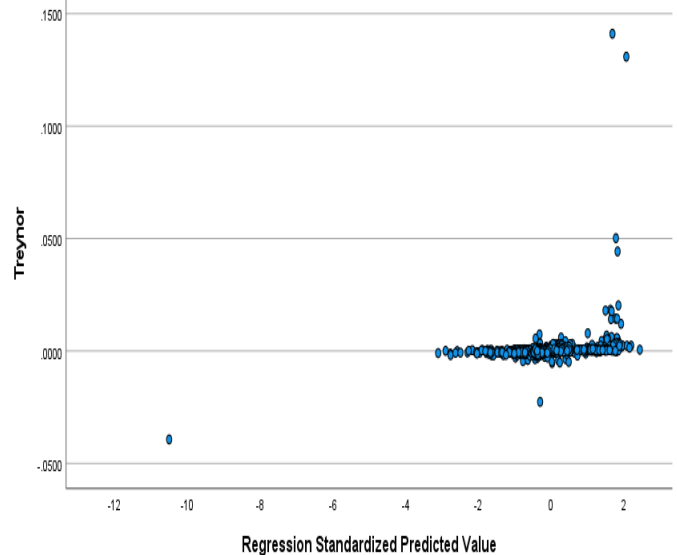Figure 2: Regression Standardized Predicted Value of Sharpe Ratio

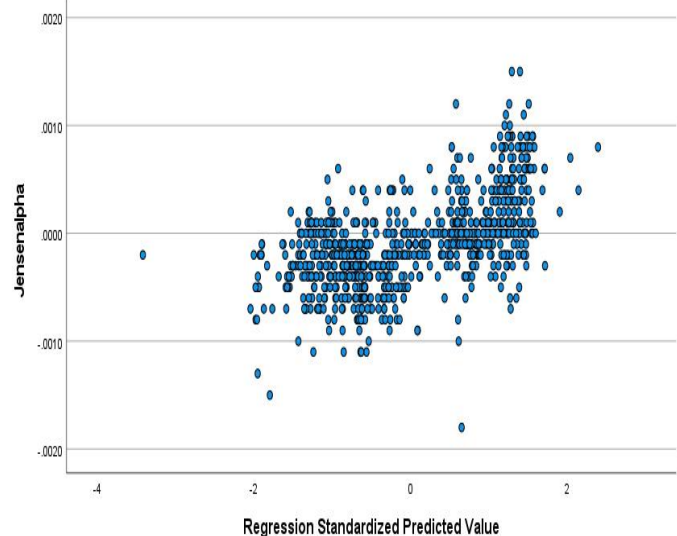Figure 3: Regression Standardized Predicted Value of Treynor Ratio

Figure 4: Regression Standardized Predicted Value of Jensen's alpha.

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Sharpe ratio, Treynor ratio, and Jensen's alpha are calculated concerning risk-adjusted performance. The Sharpe ratio result is displayed in table 5. All fund fundamentals are shown to have no meaningful effect. And only one feature, fund age, negatively influences the Sharpe ratio. External factors such as the CPI, the SET (market return), and the currency rate also negatively impact. In contrast, GDP and M2 exhibit positive effects. A weak influence is observed for volatility, and M2 is observed.

F-statistics are meaningful. The Durbin-Watson value of 1943 indicates there is no autocorrelation issue.

Table 6 illustrates the effect of fund fundamentals and features on the Treynor ratio. The Treynor ratio measures market or systematic risk. All fund fundamentals are shown to have no meaningful impact on the Treynor ratio. As for fund features, reports indicate that volatility or risk and fund age have a considerable detrimental effect. Regarding external influences, CPI, market return, and exchange rate fluctuations have a negative impact. The F-statistic is meaningful. Durbin-Watson is 2.044, which indicates there is no autocorrelation issue.

Table 4: Effect of mutual fund fundamentals, characteristics on performance measured by Return (LAG2)

Variables	Unstandardized Coefficient	Standardized Coefficient	P-Values
(Constant)	0.013		0.948
Fundamentals			
CR	0.000	-0.190	0.001***
DE	0.372	0.028	0.499
TAT	-0.011	-0.044	0.281
ROE	0.279	0.023	0.575
Characteristics			
RISK	-0.718	-0.257	0.001***
FEE	2.845E-5	0.071	0.077
TIME	-0.002	-0.026	0.540
QUANTI	3.458E-12	0.046	0.254
SIZE	2.207E-12	0.029	0.466
External Factors			
CPI	215.665	0.755	0.001***
GDP	68.723	0.471	0.001***
M2	1.075E-10	0.610	0.001***
F-statistics	17.598 (<0.001)***		
Adjusted R^2	0.316		
Durbin-Watson	1.966		

Note: ***, **, * Significant at 0.01, 0.05, 0.10, respectively

Table 5: Effect of mutual fund fundamentals, characteristics on performance measured by the Sharpe ratio

Variables	Unstandardized Coefficient	Standardized Coefficient	P-Values
(Constant)	0.139		0.001***
Fundamentals			
CR	-6.71E-6	-0.024	0.210
DE	0.008	0.012	0.545
TAT	4.00E-5	0.001	0.945
ROE	0.035	0.027	0.167
Characteristics			
RISK	-0.009	-0.034	0.078
FEE	2.56E-7	0.007	0.721
TIME	-0.001	-0.069	0.001***
QUANTI	-2.53E-14	-0.002	0.931
SIZE	-1.19E-13	-0.017	0.370
External Factors			
CPI	-21.747	-0.901	0.001***
GDP	0.784	0.078	0.001***
SET	-0.632	-0.794	0.001***
EX	-1.488	-0.428	0.001***
M2	5.15E-12	0.163	0.001***
F-statistics	141.527 (<0.001)***		
Adjusted R^2	0.695		
Durbin-Watson	1.943		

Note: ***, **, * Significant at 0.01, 0.05, 0.10, respectively

Table 6: Effect of mutual fund fundamentals, characteristics on performance measured by the Treynor ratio

Variables	Unstandardized Coefficient	Standardized Coefficient	P-Values
(Constant)	0.004		0.004**
Fundamentals			

CR	1.05E-6	0.039	0.245
DE	-0.001	-0.011	0.755
TAT	-2.83E-5	-0.010	0.773
ROE	-0.001	-0.009	0.800
Characteristics			
RISK	-0.004	-0.149	0.001***
FEE	-1.57E-10	0.000	0.999
TIME	0.000	-0.100	0.004**
QUANTI	4.14E-15	0.003	0.933
SIZE	-2.8E-15	-0.004	0.900

Table 6: Continue

Variables	Unstandardized Coefficient	Standardized Coefficient	P-Values
External Factors			
CPI	-0.408	-0.175	0.001***
GDP	0.044	0.045	0.273
SET	-0.017	-0.226	0.001***
EX	-0.053	-0.158	0.010*
M2	8.45E-14	0.028	0.642
F-statistics	5.462 (<0.001)***		
Adjusted R^2	0.067		
Durbin-Watson	2.044		

Note: ***, **, * Significant at 0.01, 0.05, 0.10, respectively

Table 7 displays the impact of fund fundamentals and characteristics on Jensen's alpha. Fund fundamentals exhibit no substantial effect on Jensen's alpha. Similar to Sharpe and Treynor ratios, the age of a fund has a significant negative impact on Jensen's alpha. External influences, such as CPI and market return, negatively impact, while M2 is positive. It is found that the association between fund age and M2 is poor, as evidenced by coefficients that are not standardized. The F-statistic is meaningful. Durbin-Watson is 2.259, which indicates there is no autocorrelation issue.

Table 7: Effect of mutual fund fundamentals, characteristics on performance measured by Jensen's alpha

Variables	Unstandardized Coefficient	Standardized Coefficient	P-Values
(Constant)	0.000		0.001
Fundamentals			
CR	2.86E-8	0.019	0.515
DE	-3.26E-5	-0.009	0.774
TAT	-1.48E-6	-0.009	0.756
ROE	0.000	0.034	0.247
Characteristics			
RISK	0.000	-0.072	0.013
FEE	1.16E-8	0.056	0.049
TIME	-1.46E-5	-0.219	0.001***
QUANTI	9.07E-16	0.011	0.704
SIZE	-1.62E-15	-0.042	0.139
External Factors			
CPI	-0.040	-0.302	0.001***
GDP	0.005	0.094	0.008
SET	-0.002	-0.506	0.001***
EX	-0.002	-0.088	0.092
M2	3.15E-14	0.182	0.001***
F-statistics	29.545 (<0.001)***		
Adjusted R^2	0.317		
Durbin-Watson	2.259		

Note: ***, **, * Significant at 0.01, 0.05, 0.10, respectively

The results of fund fundamentals, features, and external factors affecting fund performance are summarized in Table 8. Comparisons are made between standardized coefficients and impact factors. CPI has the greatest impact on all performance indicators, as indicated by their standardized coefficients, relative to all other aspects. Fund fundamentals do not affect any risk-adjusted performance metric, including the Sharpe ratio, Treynor ratio, and Jensen's alpha. Conversely, the market return substantially negatively impacts all risk-adjusted performances. Fund performance is reported to be more sensitive to economic conditions than its fundamentals and characteristics.

Table 8: Summary of significant standardized coefficients

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Explanatory Variables	Performance			
	Return (Lag2)	Sharpe Ratio	Treynor Ratio	Jensen's Alpha
Fundamentals				
CR	-0.190***			
Characteristics				
RISK	-0.257***		-0.149***	
TIME	-	-0.069***	-0.100***	-0.219***
External Factors				
CPI	0.755***	-0.901***	-0.175***	-0.302***
GDP	0.471***	0.078***		
SET		-0.794***	-0.226***	-0.506***
EX		-0.428***	-0.158*	
M2	0.001***	0.163***		0.182***

Note: ***, **, * Significant at 0.01, 0.05, 0.10, respectively

6. Conclusion and Discussion

This study investigates the impact of probable equity mutual fund performance variables in Thailand, such as their fundamentals and characteristics. Since macroeconomic and other external factors impact performance, they are also considered. The study spans five years, from 2016 to 2020. Fund fundamentals consist of liquidity, leverage, asset turnover, and profitability. While fund characteristics include volatility, management fee, fund age, the number of units sold, and fund size, unit trust sales volume is also considered. The CPI, private investment index, GDP growth, market return, exchange rate, and money supply are also macroeconomic and external factors. Return and risk-adjusted return performances are examined while evaluating fund performance.

Sharpe, Treynor, and Jensen's alpha are used to measure risk-adjusted performance. Using multiple linear regression, we analyze the effect. The created model meets the regression's underlying assumptions. Following heteroskedasticity correction, two-lag explanatory variables are utilized to describe the impact on return. The data demonstrate that a fund's liquidity, as measured by the current ratio, negatively affects its return. Concerning fund features, it is discovered that fund volatility has a large negative effect on the Treynor ratio. In addition, fund age harms all risk-adjusted performance measures, including the Sharpe ratio, Treynor ratio, and Jensen's alpha. It does not influence return, however.

CPI and market return negatively impact all risk-adjusted performance indicators for macroeconomic and external factors. In addition, GDP has a substantial favorable effect on the return and the Sharpe ratio. The exchange rate significantly negatively impacts Sharpe and Treynor ratios. In addition, the money supply positively impacts return, Sharpe ratio, and Jensen's alpha. The CPI has the highest effect on Jensen's alpha, while the market return has the largest impact on all risk-adjusted performances. Other factors, such as volatility, asset turnover, management fee, sold unit trusts, and fund size, had no meaningful effect on fund performance, according to the study. This study's empirical findings suggest that equities mutual funds are typically characterized by their strong liquidity, as indicated by the current ratio. This occurs when equity mutual funds own a significant quantity of tradable securities. This negative effect of liquidity on return is consistent with the assumption that great liquidity signifies minimal risk and, hence, a low expected return. This result is consistent with Dichev (2007)'s explanation that funds with fewer cash holdings are more resilient. This also accords with Rehman et al. (2016).

In contrast, Afza et al. (2009), Nazir et al. (2010), and Sukkasame (2021) imply that liquidity has a favorable impact on the economy. Similar to the study of Droms et al. (1996),

the empirical data revealed no influence of turnover on performance. This conclusion may suggest that a fund manager cannot employ a reflexive strategy. Such a technique arises when the connection between turnover and performance is inverse. Afza et al. (2009), Nguyen et al. (2018), and Sukkasame (2021) all discovered an inverse association, which is contradictory to the study's finding. It contradicts a favorable relationship established by Wermers (2000) and (Maroof et al., 2020). Furthermore, consistent with Sukkasame (2021), the finding reveals no substantial effect of return on equity. This little effect exists because the return on equity is a financial metric, not cash flow. Since cash flow represents market value, return on equity may not reflect the market value of NAV return. Nonetheless, this result contradicts the favorable market effect demonstrated by Budiono et al. (2010), Phakularn (2015), and Rongngern (2016).

The volatility of a fund, as measured by its standard deviation, harms its return. This aligns with the findings of Sukkasame (2021). This negative effect may be a result of investors avoiding riskier fund investments and avoiding passive funds (Razzaq et al., 2012). However, it contradicts the favorable effect discovered by (Mangkang, 2006). Next, the result demonstrates that management fees do not impact all performance metrics. This is congruent with Matallin-Saez et al. (2012). In contrast, it contradicts the positive effect proposed by Pushner et al. (2001), Gallagher (2003), Ferreira et al. (2012), Rehman et al. (2016), as well as the negative effect proposed by Freeman et al. (2000) and Mangkang (2006). As management charge demonstrates little effect, it is possible that management fee does not reflect management efficiency or the friction between fund boards and asset management firms. A fund's age negatively affects all risk-adjusted performance, which is another intriguing conclusion. This agrees with the findings of Berk et al. (2004), Ferreira et al. (2012), and Mansor et al. (2015). This could suggest that an older fund offers no experience advantage. An experienced fund manager can manage a fund notwithstanding its youth. Moreover, a more senior fund may be subject to high trading expenses (Berk et al., 2004) and falling profits (Pástor et al., 2015). However, this result contradicts Nguyen et al. (2018)'s conclusion of an insignificant fund age effect. Next, there is no fund size effect measured by unit trusts sold and total asset value. This result is similar to those of Gusni et al. (2018). This may imply that fund size advantages such as economies of scale, marginal cost reduction, and trust and confidence are not immediately apparent. In addition, the downsides of fund size, such as higher cost, liquidity, and agency problem risk, may not be obvious. Another alternative is that these advantages and negatives cancel each other out, resulting in a negligible impact. This conclusion, however, contradicts the favorable effect discovered by Grinblatt et al. (1989), Ferreira et al. (2012), Mangkang (2006), and Laiwattanachai (2017). It

also contradicts the unfavorable effect that Perold et al. (1991), Prasomsak (2001), and J. Chen et al. (2004). In terms of macroeconomic factors, the change in the CPI harms fund performance. This holds following Hermawan et al. (2016). High inflation reduces aggregate demand and supply by lowering real income and new investment (Gusni et al., 2018). High inflation also denotes substantial danger, which reduces return (Adrangi et al., 1999). However, this result contradicts the favorable effect of CPI demonstrated by Sriphatthanapibool (2016), Tangkittiwet (2018), and Kludcharoen (2021). In addition, the beneficial effect of economic variables such as GDP and money supply is found in this study since economic expansion correlates with improved performance. This aligns with the findings of Nguyen et al. (2018) and Sukkasame (2021). As baht appreciation reduces foreign investment, a negative currency rate effect is observed. These findings contradict Kludcharoen (2021), who reported that the GDP and exchange rate had no effect. Consider the market return as an external element that harms fund performance. This could be due to selectiveness and market timing. According to Maroof et al. (2020), funds with greater exposure to market movement have poor timing selectivity. Nonetheless, this result contradicts (Prasomsak, 2001) and Sriphatthanapibool (2016), who discovered a favorable influence on market return. This research contributes to the existing literature on the determinants of mutual fund performance. Risk-adjusted performances are underlined by the fact that they are promptly impacted, unlike returns. The findings are also advantageous for academics and investors. Rather than management fee and fund type, such as an active or passive fund, management structure and tenure should be explored deeper. Consequences of fund size, such as economies of scale and agency fees, are also suggested for additional research. As for practical implications, the findings imply that caution should be exercised while investing in equities mutual funds during periods of high inflation, as it substantially negatively impacts their performance. And younger funds are attractive because they can improve performance.

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