OPEN-ENDED EQUITY MUTUAL FUNDS

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Abstract

This paper examines performances of 138 open-ended equity mutual funds managed by the seventeen asset management companies in Thailand during the period 2002-2007. Several different investment horizons of fund performances were analyzed using various evaluation methods: the Treynor ratio, Sharpe ratio, Jensen's alpha and Data Envelopment Analysis (DEA) technique. The results suggest that performances of the funds measured by the first three methods, which are based on risk and return, significantly out-perform the market for all time-periods of investment. The abnormal returns of the funds for investors are significant and persistent. Meanwhile, those evaluated by the last method, which is a multi-criteria approach, result in varied outcomes: out-performing and under-performing, depending on time-periods of investment. However, on average, the funds' performance is significantly positive for three-month time period of investment, at least. Finally, it is concluded that in Thailand, open-ended equity mutual funds can be a good choice for individual investors.

Keywords: Mutual fund, open-ended fund, equity fund, fund performance, fund investment, Thailand

I. INTRODUCTION

Mutual funds have played more and more important role in financial markets in recent decades. As of the end of 2007, the world mutual fund industry managed financial assets exceeding $26 trillion (including over $12 trillion in stocks), more than four times the $6 trillion of assets managed at the end of 1996 (Investment Company Institute, 2008, cited in Ferreira, Miguel & Ramos, 2009). The number of mutual funds has also grown considerably to more than 66, 000 funds worldwide at the end of 2007, including nearly 27, 000 equity funds or approximately 40.91%. Although the growth of the mutual fund industry started in the U.S., where the industry plays an extremely important role in stock markets, this trend has spread more recently to other countries around the world (Khorana, Servaes & Tufano, 2005).

In Thailand, the mutual fund industry started with the first local closed-end fund in 1977 with an initial size of only 100 million baht. The fund was established by the first asset management company, Mutual Fund Company Limited (MFC). However, Thai mutual funds have been classified by their objectives and/or policies. These are equity fund, debt fund and balanced fund; open-ended fund and closed-end fund; onshore mutual fund and offshore mutual fund; short-term fixed income fund and long-term fixed income fund; and other types of mutual funds such as flexible portfolio fund, fund of funds, warrant fund, property fund, retirement mutual fund and sector fund. The number of these funds and their total assets have increased over time from 240 funds outstanding with total assets of 345.80 billion baht in 1999 to 815 funds and 1,372.87 billion baht in 2007(as of April 27). The market share of Thai open-ended equity funds of 138 funds was 5.58% (see Table 1).

Consequently, several individual investors have been facing choice of investment funds. As an individual investor, he/she regularly relies on help of financial planners, popular press or financial magazines or some other sources of information, such as security analysts, mutual fund management companies and the Association of Investment Management Companies (AIMC) (also see Brennan & Hughes, 1991). Explicitly, an industry, such as Morningstar and Lipper, collects data on mutual funds to compare and rate fund performance, and supplies investors with information for investment decisions (Ferreira et al., 2009).

Most mutual fund studies have focused on the use of risk-adjusted performance measure as an alternative for individual investors in selecting investment opportunities. The Sharpe ratio is probably the most widely used measure because it is meaningful when either risk perceived by investors can be expressed by standard deviation or when returns are normally distributed. Other similar measures, such as the Treynor ratio and Jensen's alpha are also used in studies.

However, another view is that the need to consider simultaneously multi-criteria incorporating investors' own preferences is natural as they not always share the same financial objective, risk aversion and investment horizon. From this perspective, in addition to using the traditional measures, this study applies the Data Envelopment Analysis (DEA) technique to evaluate performances of equity mutual funds in Thailand. The results are then compared to those obtained using the different measures applied in the analyses. Specifically, this study calculates net returns as well as risks and investigates whether or not the mean return of the funds significantly out-performs the market and persists. Studies have emphasized closed-ended funds rather than open-ended funds. Even though the number of open-ended funds has been increasing, research regarding these topics on emerging markets, particularly Thailand has been limited. Thus, it is justified to carry out a comprehensive study on Thai open-ended equity mutual funds' performance to understand more about their behavior and then to provide investment information for investors.

As Thailand is an important emerging market in South-East Asia (Khanthavit, 2001) that reduces risk and increases expected returns, rendering significant diversification benefits for globally-minded investors (Bekaert & Urias, 1998). This study makes contributions to the literature in terms of the results for Thai open-ended equity mutual funds that add to this area for emerging markets. Finally, the results from the study can be used as an investment guide for both local and foreign individual investors. This study is organized as follows: Section 1 introduction to mutual funds. Section 2 reviews the literature of relevant studies of funds' performance. Section3 describes data and presents various methods used for open-ended equity mutual funds' performance analyses in this study. Section 4 includes analyses and results while the last section provides conclusions of the study.

2. REVIEW OF LITERATURE

Meanwhile, investors tend to invest in funds with subsequent good performance that displays some fund selection ability. Detzler (1999) argues that in an efficient market, mutual fund managers cannot beat the market and any superior performance is simply luck and does not persist. Early studies on mutual funds; see, for example, Jensen (1968) and Sharpe (1966) support the efficient market hypothesis. However, later studies such as Elton, Gruber, and Blake (1996), Goetzmann and Ibbotson (1994) and Hendricks, Patel, and Zeckhauser (1993) find that past performance of mutual funds can predict future performance. Studies e.g., Brown and Goetzmann (1995), Chevalier and Ellison (1997), Grinblatt and Titman (1989), Guber (1996), Hendricks, Patel, and Zeckhauser (1993), Ippolito (1989), Malkiel (1995) and Sirri and Tufano (1998) conclude that mutual funds under-perform the market. Carhart (1997) shows that performance persistence in his sample can be attributed to a momentum factor; meanwhile Malkiel (1995) uses a large sample of mutual funds and finds performance persistence during 1973-1981, but there is no evidence of persistence during 1982-1991. Wermers (2003) reports that mutual fund returns strongly persist over multi-year periods.

Apparently, the evidence on performance and performance persistence are mixed. However, the more recent findings cast doubts on the efficient market hypothesis and rekindle investors' hope of earning abnormal returns by plowing through historic performance records (also see Zheng, 1999). Thus, if mutual fund performance is predictable, using fund (historical) performance can help investors select funds that will continue to out-perform in the future.

The literature focuses in general on the U. S. mutual fund industry; see, for example, studies on the U.S. market by Grinblatt and Titman (1994), Kothari and Warner (2001), Ferreira et al. (2009). Several authors examine fund performances in individual developed countries, such as studies on the U.K. market by Blake and Timmermann (1998); studies on Netherland by Plantinga and Groot (2001); studies on Australia by Bird, Chin, and McCrae (1983); France by Dermine and Roller (1992); Italy by Casarin, Pelizzon, and Piva (2007) and Panetta and Cesari (2002); Japan by Cai, Chan, and Yamada (1997); Sweden by Dahlquist, Engstrom, and Soderlind (2000). For emerging countries, although they have attracted the attention of investors all over the world, there have been much lesser studies on mutual funds; e.g., studies on the Greek market by Artikis (2001), Mylonas (1995), Noulas, Papanastasiou, and Lazaridis (2005) and Sorros (2001); and other markets by Agrawal (2007), Bekaert and Urias (1998), Borensztein and Gelos (2000), Gupta and Aggarwal (2007), Khan (2008), Muga, Rodriguez, and Santamaria (2007) and Ong and Sy (2004).

Notice that U.S. funds are much larger than elsewhere in the world, and domestic funds are larger than international funds, on average. There are reasons to believe that results of studies may be different as there are significant different characteristics between the U.S. mutual fund industry and the rest of the world.

These factors include fund size, style, age and fees, economic development, financial development, quality of legal institutions and law enforcement, mutual fund industry structure and others (see Chen, Hong, Huang & Kubik, 2004; Gehin 2004; Khorana et al., 2005 and Khorana, Servaes & Tufano, 2009). Ferreira et al., (2009) find mutual funds under-perform the market overall, but provide strong evidence of short-run persistence in both domestic and international funds; however, the persistence is much weaker in non-U.S. domestic funds (also see Grinblatt & Titman, 1994 and Otten & Bams, 2002). Meanwhile, Detzler (1999), a U.S study, reports the results do not support the short-term persistent performance hypothesis. In addition, evidence indicates that there is a strong positive relation between the performance of domestic mutual funds and a country's level of financial development; funds domiciled in countries of common-law traditions perform better; and investors in the U.S. have some ability to select funds as money flows to funds with good future performance (Zheng, 1999).

For emerging markets, Muga et al. (2007), a Mexico study, find persistence in mutual fund performance both over consecutive time periods and in the multi-period setting. Noulas et al. (2005), a Greek study, analyze the behavior of 23 mutual funds for the period 1997-2000 and conclude that the mutual fund industry is relatively young resulting in no definite conclusion. Agrawal (2007), a study on Indian mutual funds, reveals that performance of the fund managers affects the returns of the firm. Moreover, mutual fund is not a widely discussed subject in developing markets including Thailand, when compared to others. Among few studies that have focused on Thai mutual funds, Nitibhon (2004) employs the Jensen's alpha, the condition model, factor model and portfolio holding model to measure performances of 114 equity funds in Thailand. The results suggest statistically insignificant positive returns. Tirapat (2004b) uses monthly NAV and its flow during January 2000 to December 2002 to estimate returns. The performance measurement for the Thai equity funds was examined using the Treynor ratio, Sharpe ratio and Jensen's alpha. The results from the sample of 222 funds out-perform the market, but there is no persistency in performance during the periods of study, which are consistent with those of Detzler (1999), but are inconsistent with Ferreira et al.(2009) and Muga et al. (2007).

Several studies have employed extensive mutual fund return history and sophisticated statistical tools; meanwhile, many studies have applied only the conventional evaluation methods. In Thailand, given a limited number of studies of equity mutual funds, these studies have focused on closed-end funds rather than open-ended funds, even though open-ended funds enable one to track the indexes much better than closed-end funds (Bekaert & Urias, 1998). Furthermore, they have been restricted to the traditional fund performance measures. Using more several and different methods result in a range of outcomes compared to past studies, and this can increase a variety of choices of investment opportunity for individual investors. At the same time, the doubts whether or not the results obtained using diverse methods are reliable.

This study evaluates performances of 138 open-ended equity mutual funds, which were managed by the seventeen asset management companies based in Thailand, between May 2002 and April 2007. The performances were analyzed using several more metrics: the Treynor ratio, Sharpe ratio, Jensen's alpha and DEA technique. They were then compared to those of the index of the Stock Exchange of Thailand (SET index) whether the average fund performance is significantly and persistently greater than the market. There has been a remarkable growth in the mutual fund industry in Thailand, and fund asset management companies have offered opportunities to investors in the form of safety, hedging and arbitrage (also see Agrawal, 2007). These have attracted large investments not only from domestic but also foreign investors. According to this view, this study contributes to the area of financial economics providing results that can be guidelines for investors to select mutual funds for their investments.

3. DATA AND METHODOLOGY

Unlike other Thai studies of mutual funds, which mostly have been closed-end fund performance investigation and used weekly return, short time-period of data plus limited evaluation method, such as Khanthavit (2001), Nitibhon (2004) and Tirapat (2004b), this study uses monthly and longer time-period of data covering net asset values and dividends for the five-year period (May 1, 2002 - April 30, 2007). A larger sample consisting of the returns on the portfolio of 138 open-ended equity mutual funds was examined. There are four significant sources of data used for analyses in this study set out as follows: the AIMC, asset management companies, the SET and finally, the Bank of Thailand (BOT) is another source providing 91-day coupon rate of the Thai government bonds. In early studies, portfolio performances were measured mostly in terms of returns because risk was difficult to quantify and it could not be incorporated in evaluation as there was no measure that combined both return and risk.

However, Rao et al., (2006) suggest that returns on portfolios that belong to the same risk class can be compared using the three different approaches of portfolio performance measurement: the Treynor ratio, Sharpe ratio and Jensen's alpha. A number of studies applied these methods or part of them, e.g., Artikis, 2002; Douglas & Janis, 2001; Noulas et al., 2005; Pushner, Rainish & Coogan, 2001; Ramesh & Raj, 1987; Rao et al., 2006; and Thai studies, such as Koncharearn, 1992 and Leenabanchong & Poevijit, 1996 (cited in Tirapat, 2004b) and Tirapat, 2004b.

However, the measurement of relative efficiency addressed by Farrell (1957) is more appealing, due to existence of multiple inputs and outputs. Nguyen-Thi-Thanh (2006) asserts that the DEA technique can be applied to assess mutual fund performance. Rao et al. (2006) suggest that the use of the DEA technique in evaluating mutual fund performances seems an interesting application. The DEA technique was initiated by Murthi, Choi, and Desai (1997), and has been employed and revisited by several studies, including Basso & Funari, 2001; Basso & Funari, 2003, 2005; Choi & Murthi, 2001; McMullen & Strong, 1998; Morey & Morey, 1999; Sengupta, 2003 and Tarim & Karan, 2001.

Specifically, Thai studies of performance of mutual funds have focused on the traditional measures of risk and return or single approach rather than multi-criteria approach or the DEA technique. These studies ignore other variables such as diversification, selectivity, market timing, fund management expenses, transaction costs and others. To have a variety of results and check robustness, this study applies various performance evaluation methods: the Treynor ratio, Sharpe ratio, Jensen's alpha and DEA technique. Moreover, this study includes several different investment horizons of the analyses of fund performances, consisting of six time-periods: 1-month (April 1, 2007 – April 30, 2007); 3-month (February 1, 2007 – April 30, 2007); 6-month (November 1, 2006 – April 30, 2007); 1-year (May 1, 2006 – April 30, 2007); 3-year (May 1, 2004 – April 30, 2007); 5-year (May 1, 2002 – April 30, 2007).

3.1 Treynor ratio

$$T_p = \frac{r_p - r_f}{\beta_p} \quad \text{.....(1)}$$

Where T_p is the Treynor ratio, r_p the portfolio return, r_f the risk-free return and β_p the systematic risk.

3.2 Sharpe ratio

$$S_p = \frac{r_p - r_f}{\sigma_p} \quad \text{.....(2)}$$

Where Sp is the Sharp ratio, rp the portfolio return, rf the risk-free return and σp the total risk of portfolio.

3.3 Jensen's alpha

$$J_p = r_p - \{r_f + \beta_p (r_m - r_f)\} \quad \text{.....(3)}$$

Where J_p is the Jensen's measure for portfolio, r_p the portfolio return, r_f the risk free return, β_p the systematic risk and r_m the market return.

3.4 Data Envelopment Analysis (DEA)

$$\text{Max } E_k = \frac{\sum_{o=1}^{t} u_o y_{ok}}{\sum_{i=1}^{m} v_i x_{ik}} \quad \text{.....(4)}$$

Subject to:

$$E_k = \frac{\sum_{o=1}^{t} u_o y_{ok}}{\sum_{i=1}^{m} v_i x_{ik}} \le 1 \qquad k = 1, 2, \ldots, n$$

$$u_o \ge 0 \qquad o = 1, 2, \ldots, t \qquad v_i \ge 0 \qquad i = 1, 2, \ldots, m$$

Where E_k is the DEA score of k^{th} DMU, y_{ok} the amount of the o^{th} output for the k^{th} DMU, x_{ik} the amount of the i^{th} input for the k^{th} DMU, u_o the weight assigned to the o^{th} output, v_i the weight assigned to the i^{th} input, *t* the number of outputs, *m* the number of inputs and *n* the number of DMUs.

The inputs of the model are the weighted fees and expenses, systematic risk and total risk. The outputs are returns, diversification and manager skill. In Thailand, the appropriate performance benchmarks used to compare mutual fund returns have been defined by the AIMC. These are the SET index, which is the most widely used as Thai market benchmark for equity funds, and the SET 50, which is also used for equity fund benchmark. However, in this study the SET index was selected as the performance benchmark. The net return that an investor achieves in investing in a mutual fund depends on dividend and capital gain or loss that comes from the change in the net asset value. Returns of the mutual funds and the market in a time-period were calculated as:

$$\text{Fund return} = \left(\frac{\text{NAV}_{t+1} + \text{Div}_{t \to t+1}}{\text{NAV}_t} - 1\right) \times 100 \quad \text{.....(5)}$$

Where NAV_t is the NAV at the buying month, NAV_{t+1} the NAV at the month-end of a period and $\text{Div}_{t \to t+1}$ the amount of cash distributed during the period to shareholders.

$$\text{Market return} = \left(\frac{\text{SET}_{t+1}}{\text{SET}_t} - 1\right) \times 100 \quad \text{.....(6)}$$

Where market return is the return on the SET index, SET_t the SET index at the buying month and SET_{t+1} the SET index at the month-end of a period.

Risks were estimated as the expressed equation:

$$\text{Var(r)} = \frac{1}{n}\sum_{i=1}^{n}\left[r_i - r_{am}\right]^2 \quad \text{.....(7)}$$

Where r_i is the return of individual mutual fund and r_{am} the mean rate of returns.

$$r_p = \alpha + \beta \times r_{\text{m}} + e_p \quad \text{.....(8)}$$

Where r_p is the portfolio return, α the intercept term, β the systematic risk, r_{m} the market return and e_p the error term.

The regressing of systematic risk also provided the value of r^2 that gives the strength of correlation between the fund returns and the market indicating the diversification.

$$\text{Manager's investment skill} = (r_p - r_f) - (\sigma_p/\sigma_{\text{m}})(r_{\text{m}} - r_f) \quad \text{.....(9)}$$

Where r_p is the portfolio return, r_f the risk free return, r_{m} the market return, σ_p the total risk of portfolio and σ_{m} the total risk of the market

4. RESULTS

The following section presents the results of the analyses of performances of 138 funds. These open-ended equity mutual funds were managed by the seventeen asset management companies in Thailand between May 1, 2002 and April 30, 2007. The investment horizons include six time-periods from 1-month to 5-year horizon. The outcomes of the analyses are performances of equity mutual funds which are shown and explained in terms of out-performing or under-performing funds compared to the market. The main issues are the size and signs or the existing of these excess returns, and whether or not they are significantly out-performed and persistent. The performances of these open-ended equity mutual funds were evaluated using different measures which are summarized in Tables 2-5.

To test the null hypothesis that the mean return for a sample of *n* funds is greater than the market, *t*-test statistic is applied.

H_0: Open-ended equity funds under-perform the market

H_1: Open-ended equity funds out-perform the market

Table 2 presents that on average, the performances of open-ended equity mutual funds in the sample of this study are significantly positive for most time-periods of investment. Between 89-100% of the numbers of total funds are out-performers. The Treynor ratio of the funds for 1-year time-period is negative; however, the fund performance still out-performs the market.

Table 3 shows that Thai open-ended equity funds in the sample of this study performs significantly greater than the market, for all time-periods of investment. The average percentage point of out-performing funds ranges from 73% to 98%. The Sharpe ratios of the funds and the SET index for 1-year time-period are negative; however, the funds still perform better than the market. The results are certainly consistent with those evaluated using the Treynor ratio.

Table 4 reports that nearly all funds perform significantly better than the market for all time-periods of investment. The percent of out-performing funds varies between 89% and 100%. This explains that the funds gain abnormal returns when compared to the returns of the market.

Table 5 demonstrates comparison results between the means of the DEA scores of the equity mutual funds and those of the SET index, suggesting that 3-month time-period of investment leads the investors significant and positive abnormal returns, or the funds significantly out-perform the market. Meanwhile, the remaining time-periods of investment result in the investors negative abnormal returns. However, the performances in these periods are significant only for 1-month and 1-year time-period analyses. Thus, the results differ depending on time-periods of investment. Specifically, the asset management companies which managed the funds during the study time-periods show better performance for 3-month time-period of investment; and worse performances for 1-month and 1-year time-periods respectively, as compared to the market. The results are different from those estimated using the Treynor ratio, Sharpe ratio and Jensen's alpha, which are significantly positive and persistent.

5. CONCLUSION

The results show that on average, the performances of Thai open-ended equity mutual funds significantly out-perform the market for all time-periods of investment, when measured using the Treynor ratio, the Sharpe ratio and the Jensen's alpha. The results are accordance with those suggested by past studies on developed markets, such as Kacperczyk, Sialm, and Zheng (2008); Zheng (1999) and Otten and Bams (2002), but they are not in line with those reported by Casarin, Pelizzon, and Piva (2007) and Detzler (1999) in terms of excess returns. Also, the results are entirely consistent with those suggested by studies on emerging markets, such as Muga et al., 2007 and Tirapat, 2004b; and similar to those of Rao et al., 2006. If past performance can predict future performance, as evidenced by such studies as Agrawal, 2007; Berkowitz, 1997; Goetzmann & Ibbotson, 1994 and Elton et al., 1996, the results of the fund performance analyses provided by this study are suggested to be used as an investment guide for individual investors.

To strengthen and check robustness of the results measured by the conventional methods, this study further analyzes the fund performances for all investment horizons applying a more complicated method or the DEA technique. The results suggest that for 3-month time-period of investment, the open-ended equity mutual funds significantly out-perform the market; meanwhile for 1-month and 1-year time-periods, the funds under-perform the market. Therefore, the results derived from the analyses for different time-periods of investment using the DEA technique are inconclusive, which are different from those estimated using the funds' traditional evaluation methods. Thus, the evidence suggests that different metrics can give different outcomes, and can be concluded that for investors who are considering fund performance evaluation applying the DEA technique should be cautious to select their open-ended equity mutual funds.

This study is more comprehensive as it is the first Thai mutual fund study using both the traditional evaluation methods and the DEA technique, and investigating six investment horizons, leading more variety of outcomes and comparisons with other markets. Thus, the study enriches literature in terms of results of international comparisons and enhancing understanding of performances of equity mutual funds, managed by asset management companies in emerging countries in general and Thailand in particular. Finally, it is concluded that the results provided by this study suggest that in Thailand, open-ended equity mutual funds is a good investment choice, especially for individual investors.

Table 1 Mutual Funds Managed by the Seventeen Asset Management Companies in Thailand during the Period of 2002-2007

Fund Type	Number of Funds	Total Net Assets (Baht) April 27, 2007	Mkt. Share (%)
Closed-end Equity Fund	1	924,967,303.86	0.07%
Open-ended Equity Fund	138	76,669,217,644.66	5.58%
Closed-end Specific Equity Fund	0	-	0.00%
Open-ended Specific Equity Fund	25	15,232,499,084.95	1.11%
Closed-end General Fixed Income Fund	44	17,342,710,412.62	1.26%
Open-ended General Fixed Income Fund	226	540,455,823,040.25	39.37%
Closed-end Specific General Fixed Income Fund	7	8,336,547,474.08	0.61%
Open-ended Specific General Fixed Income Fund	129	165,893,306,350.37	12.08%
Closed-end Long-term Fixed Income Fund	0	-	0.00%
Open-ended Long-term Fixed Income Fund	0	-	0.00%
Closed-end Specific Long-term Fixed Income Fund	0	-	0.00%
Open-ended Specific Long-term Fixed Income Fund	0	-	0.00%
Closed-end Short-term Fixed Income Fun	0	-	0.00%
Open-ended Short-term Fixed Income Fund	8	21,184,622,799.08	1.54%
Closed-end Specific Short-term Fixed Income Fund	0	-	0.00%
Open-ended Specific Short-term Fixed Income Fund	0	-	0.00%
Closed-end Money Market Fund	0	-	0.00%
Open-ended Money Market Fund	8	29,485,230,372.05	2.15%
Closed-end Specific Money Market Fund	0	-	0.00%
Open-ended Specific Money Market Fund	0	-	0.00%
Closed-end Balanced Fund	0	-	0.00%
Open-ended Balanced Fund	7	2,427,442,528.08	0.18%
Closed-end Specific Balanced Fund	2	100,724,786.87	0.01%
Open-ended Specific Balanced Fund	1	147,589,213.33	0.01%
Closed-end Flexible Portfolio Fund	3	144,287,216,508.23	10.51%
Open-ended Flexible Portfolio Fund	42	29,955,529,677.62	2.18%
Closed-end Specific Flexible Portfolio Fund	1	8,288,491,451.00	0.60%
Open-ended Specific Flexible Portfolio Fund	49	57,746,669,483.28	4.21%
Closed-end Fund of Funds	0	-	0.00%
Open-ended Fund of Funds	12	12,414,413,326.09	0.90%
Closed-end Specific Fund of Funds	0	-	0.00%
Open-ended Specific Fund of Funds	10	8,221,503,436.39	0.60%
Closed-end Warrant Fund	0	-	0.00%
Open-ended Warrant Fund	0	-	0.00%
Closed-end Specific Warrant Fund	0	-	0.00%
Open-ended Specific Warrant Fund	0	-	0.00%
Closed-end Sector Fund	0	-	0.00%
Open-ended Sector Fund	0	-	0.00%
Closed-end Specific Sector Fund	0	-	0.00%
Open-ended Specific Sector Fund	0	-	0.00%
Closed-end Property Fund	13	48,508,117,498.52	3.53%
Open-ended Property Fund	0	-	0.00%
Closed-end Property Fund for Resolving Financial Institution Problem	23	48,859,266,516.44	3.56%
Open-ended Property Fund for Resolving Financial Institution Problem	0	-	0.00%
Closed-end Mutual Fund for Resolving Financial Institution Problem	10	16,611,448,145.32	1.21%
Open-ended Mutual Fund for Resolving Financial Institution Problem	0	-	0.00%
Closed-end Property and Loan Fund	47	111,296,852,672.53	8.11%
Open-ended Property and Loan Fund	0	-	0.00%
Closed-end Equity Country Fund	3	7,366,073,887.74	0.54%
Open-ended Equity Country Fund	4	633,287,400.76	0.05%
Open-ended General Fixed Income Country Fund	1	58,109,315.34	0.00%
Open-ended Specific Flexible Portfolio Country Fund	1	420,695,713.53	0.03%
Total	815	1,372,868,356,042.99	100.00%

Source: The Association of Investment Management Companies (AIMC), Thailand

Table 2 Performance of Thai Open-ended Equity Funds Evaluated Using the Treynor Ratio

Time period	% Out perform	Mean	Market	Std. deviation	Std. error	*t*-stat	Sig
1-Month	89	0.0376	0.0314	0.0084	0.0007	8.71	0.000
3-Month	100	0.0257	0.0165	0.0058	0.0005	18.41	0.000
6-Month	98	0.0015	-0.0033	0.0039	0.0003	14.53	0.000
1-Year	96	-0.0027	-0.0062	0.0026	0.0002	16.11	0.000
3-Year	91	0.0042	0.0015	0.0027	0.0003	9.90	0.000
5-Year	100	0.0167	0.0085	0.0036	0.0004	20.07	0.000

Table 3 Performance of Thai Open-ended Equity Funds Evaluated Using the Sharpe Ratio

Time period	% Out perform	Mean	Market	Std. deviation	Std. error	*t*-stat	Sig
1-Month	73	6.0448	5.5929	0.9537	0.0812	5.57	0.000
3-Month	98	3.4219	2.4299	0.5115	0.0435	22.78	0.000
6-Month	98	0.0760	-0.1724	0.1945	0.0166	15.00	0.000
1-Year	96	-0.1709	-0.4013	0.1577	0.0134	17.16	0.000
3-Year	90	0.3139	0.1198	0.1916	0.0193	10.07	0.000
5-Year	87	0.8046	0.6521	0.1497	0.0173	8.82	0.000

Table 4 Performance of Thai Open-ended Equity Funds Evaluated Using the Jensen's alpha

Time period	% Out perform	Mean	Market	Std. deviation	Std. error	*t*-stat	Sig
1-Month	89	0.0063	0.0000	0.0061	0.0005	12.23	0.000
3-Month	100	0.0080	0.0000	0.0034	0.0003	27.53	0.000
6-Month	98	0.0044	0.0000	0.0034	0.0003	15.17	0.000
1-Year	96	0.0033	0.0000	0.0023	0.0002	17.30	0.000
3-Year	91	0.0025	0.0000	0.0022	0.0002	11.07	0.000
5-Year	100	0.0054	0.0000	0.0019	0.0002	24.94	0.000

Table 5 Performance of Thai Open-ended Equity Funds Evaluated Using the DEA Technique

Time period	% Out perform	Mean	Market	Std. deviation	Std. error	*t*-stat	Sig
1-Month	49	0.9354	0.9440	0.0400	0.0034	-2.53	0.012
3-Month	80	0.9482	0.9269	0.0465	0.0040	5.39	0.000
6-Month	78	0.9079	0.9222	0.0902	0.0077	-1.86	0.065
1-Year	78	0.9251	0.9411	0.0846	0.0072	-2.23	0.028
3-Year	83	0.9432	0.9556	0.0625	0.0063	-1.97	0.052
5-Year	76	0.9686	0.9742	0.0460	0.0053	-1.05	0.296

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