Behavioral Finance Factors and Investment Decision on Thai Mutual Fund

Tatre Jantarakolica[1]

Faculty of Economics, Thammasat University, Bangkok, Thailand

tatre@econ.tu.ac.th

Rapee Moungnont

College of Innovation Management, Rajamangala University of Technology Rattanakosin,

Nakhon Pathom, Thailand

mnrapee@gmail.com

Abstract

Thai mutual funds have grown rapidly for the past decade. This research intends to study investment decision making of Thai mutual fund investors. Behavior finance concepts, including self-control bias, overconfidence bias, loss aversion bias, mental accounting bias, and degree of risk aversion, are employed in determine decision on investing in mutual fund. Experimental survey research is conducted by using self-reported questionnaire from 600 Thai investors. Multivariate Probit models are employed in analyzing the investment decision of respondents on top three Thai mutual funds. Estimated results indicate that behavior finance factors have significantly impacts on investment decision of investors. Additionally, perception on asset management companies of the mutual fund plays an important role in determining investment decision of respondents. Therefore, asset management companies should focus on their mutual fund performance and also building up their company image in order to motivate investors to invest in their mutual fund.

Keywords: Mutual Fund, Behavioral Finance, Self-control Bias, Overconfidence Bias, Loss Aversion Bias, Mental Accounting Bias, Degree of Risk Aversion

[1] **Corresponding author**

1. Introduction

Thai mutual funds have been rapidly grown from total value of 435.4 Million Baht in 2002 to 3 Billion Baht in 2013. This huge expansion of Thai mutual funds implies that investment and saving behavior of Thai investors has switched from money market, traditional saving in bank deposit, to capital market by investing through mutual funds. With high growth rate of mutual fund, the mutual fund asset management companies are currently facing high competition. Figure 1 shows market share of mutual fund asset management companies in 2013 which indicates that Thai mutual fund market has been dominated by three major mutual fund asset management companies, including Kasikorn Asset Management, SCB Asset Management, and Krungthai Asset Management. Therefore, it becomes interesting to know how investors make their decision in choosing which mutual fund to invest. According to traditional financial theory, investor should invest based on expected risk and expected return by assuming rational choice behavior (Markowitz, 1952).

However, behavioral financial theory has argued that investors can be irrational, thus, their investment behavior can be biased based on several behavior factors biases, including self-control bias, overconfidence bias, loss aversion bias, mental accounting bias, and degree of risk aversion, are employed in determine decision on investing in mutual fund (Thaler & Richard, 1990; Kahneman & Tversky, 1979; Odean, 1998). This study intends to reveal factors influencing investment decision making of Thai mutual fund investors based on behavioral finance concepts.
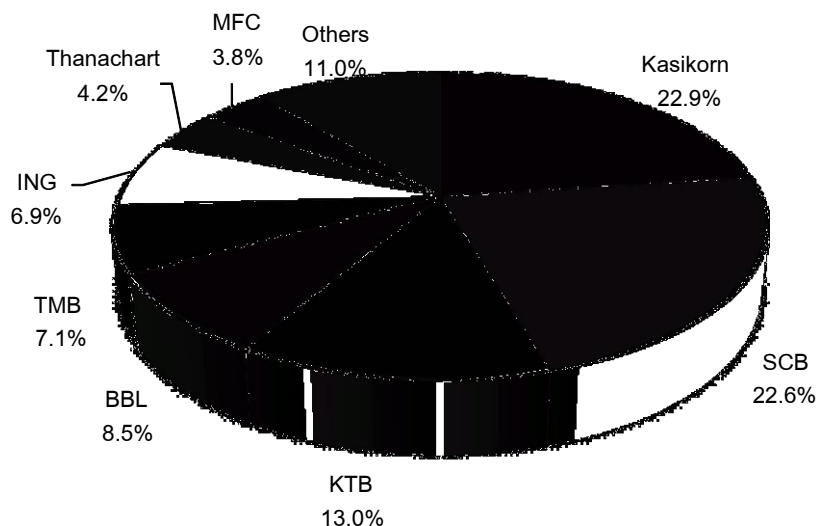

Figure 1: Market Share of Mutual Fund Asset Management Companies in 2013

2. Conceptual Framework

Studies concerning on factors determining investment decision can be classified into two groups. First group follows on traditional financial theory based on rational choice assumption while second group emphases on behavioral financial theory assuming investors can be irrational.

2.1 Traditional Financial Theory

In the modern era of financial theory, Markowitz (1952), who pioneered the Modern Portfolio Theory (MPT), which is the foundation of Capital Asset Pricing Model (CAPM) by Sharpe (1964), proposed that, at certain level of individual's risk tolerance, investor should select a security as if it maximizes expected return. This means that one should invest in a high risk security, at acceptable risk level, because it might pay him a high payoff. According to the intuition of MPT and CAPM, it means that risk-return tradeoff and investor's degree of risk aversion should be important factors that investors consider for portfolio choice. The assumptions underlying CAPM are, first, markets are efficient and, second, investors are "rational." However, in real world financial markets, the market anomalies have been observed and seem to challenge these assumptions. The violations indicate that MPT and CAPM cannot capture all the activities that actually occur in financial markets. In portfolio selection perspective, it can be implied that there could be factors other than risk-return tradeoff and degree of risk aversion that are considered as determinants of portfolio choice.

Many researchers have identified violations of CAPM assumptions. Some irrational investors randomly trade by using non-informative news (Black, 1986). Noise traders were also found as they have a persistent impact on markets (De Long, Shleifer, Summers, & Waldman, 1990). Heterogeneity in investors' beliefs and trading styles can lead to irregularities (Farmer & Joshi, 2002). The evidence of disposition effect (i.e., the tendency to sell winners quicker than losers) is also found (Odean, 1998). Lastly, irrational behavior like investors' overconfidence bias and mental accounting bias were also identified (Thaler & Richard, 1990).

2.2 Behavioral Financial Theory

Behavioral finance is the study of the influence of psychology on finance and behavior. Behavioral finance is field of study that attempts to apply cognitive psychology study to help explain the anomalies of the standard financial theories and why individuals make irrational financial decisions. Behavioral finance models can be applied at both macro and micro levels. Behavioral finance micro examines behaviors or biases of individual investors that distinguish them from the rational actors envisioned in classical economic theory. Behavioral finance macro

detects and describes anomalies in the efficient market hypothesis that behavioral models may explain (Pompian, 2012).

There are many behavioral finance biases, including self-control bias, overconfidence bias, loss aversion bias, and mental accounting bias. Additionally, among these biases are related to portfolio investment decisions.

(1) Self-control bias

It is a human behavioral tendency that causes people to consume today at the expense of saving for tomorrow. It is can be described as a conflict between people's overarching desires and their inability, stemming from a lack of self-discipline, to act concretely in pursuit of those desires. The technical description of self-control bias is best understood in the context of life-cycle hypothesis, which describes a well-defined link between the savings and consumption tendencies of individuals (Pompian, 2012).

Life-cycle hypothesis, saving decision theory, employs expected utility theory assuming that individuals make rational choices about their consumption and saving to reach optimal saving decision at different stage of life with limited resources available over their lifetime (Modigliani & Brumberg, 1954). In addition, the theory assumed that, for each individual, the increases in life-time resources lead to proportionate increases in consumption in all periods of life. As a result, consumption is proportionate to life-time resources or to average income over the life span (Thaler & Benartzi, 2004).

The main prediction of the life-cycle hypothesis is a lifetime saving profile characterized by a hump-shaped curve of saving as a function of time. The income profile of individual over the life cycle starts with low income during early working years, followed by increasing income that reaches a peak prior to retirement (Pompian, 2012). Therefore, at the young age, individuals have to borrow to finance their consumption. At the middle age, they would save money and accumulate their wealth for retirement as their incomes are high during this stage of life. Then, they will reduce their savings or their investment during retirement when their income is substantially low.

Simply put, the life cycle hypothesis implies that individuals try to smooth their consumption path by putting money aside for use at retirement and the amount of saving is proportionate with the increase in resources over the life cycle. It also implies that savings and investment rates vary with age and income level. Also, other factors, lifetime wealth, and the interest rate affect the saving rate of individuals. The underlying behavior of this theory is self-control. Individuals need to trade off their current consumption with future savings by setting money aside for future consumption and they need the will power to do so. However, the self-control bias or self-control problem prevents individuals from making rational decisions for

retirement. Why do people struggle with the decision making to save for retirement? There are many possible reasons. One of which is the complexity of retirement saving planning. How much money is needed to live comfortably after retirement? When to start saving? And what instruments to invest? These questions require a lot of work and assumptions on the unknown factors such as future earnings, inflation rate, longevity, retirement age, etc. Another obstacle that affects the retirement saving decision is the 'hyperbolic discounting behavior'. Hyperbolic discounters apply high discount rates to the near term and lower discount rates to the future. In this case, one dollar's worth of saving today is perceived to grow rapidly in the short run and less in the long run. Hyperbolic discounters place a lower value on the future benefits and higher value on the present. They would over consume today because of self-control problems when it comes to saving for retirement (Mitchell & Utkus, 2006).

From the theory aforementioned, self-control has correlation with decision to save for retirement and it should have a positive relationship. It is also expected that individuals with high level of self-control would be likely to save in the long-term instruments such as RMF, LTF, and insurance. Those who have low level of self-control tend to value today's consumption and would prefer short-term retirement saving plans.

(2) Overconfidence bias

It is a cognitive bias that can be summarized as unwarranted faith in one's intuitive reasoning, judgments, and cognitive abilities (Pompian, 2012). Overconfidence implies an overly optimistic assessment of one's knowledge or control over a situation. This behavior trait is widely studied for investing abilities. Individuals with this bias tend to believe they are better than others when choosing the best stocks and the best timing. However, with the retirement planning complication previously mentioned and to seek information for retirement saving decision making, individuals may need to turn to others for advice. It is likely that their advisors would be someone close such as spouses, friends, or their colleagues at work. Therefore, overconfidence level should have an impact on decision making for retirement saving. Those who need other's help are considered as low-overconfidence and vice versa. Moreover, low overconfidence level may create procrastination and inertia and prevent individual from saving.

The evidence of peer effects is documented in the study by Duflo & Saez (2002). They investigate whether peer effects play an important role in retirement savings decisions by studying the employee decisions to enroll in a Tax Deferred Account plan sponsored by the university, and the choice of mutual fund vendor for people who choose to enroll, are affected by the decisions of other employees in the same department. The results show that peer effect may be an important determinant of saving decisions. One possible reason for peer effect is the conformity behavior. Savings decisions may be influenced by social norms or beliefs about social norms. By observing

co-workers, people can learn about proper behavior of their social group and they may want to maintain the same consumption level as what is common in their social group. Another reason is the lack of knowledge or information necessary for decision making. A convenient way to get information is to ask for advice from peers. One example of such behavior is shown in 'Heuristics and Biases in Retirement Savings Behavior' by Thaler & Benartzi (2004) regarding the behavior of retirement plan participants of a chain of supermarkets in Texas. The plan provider noticed that participants' behavior in each supermarket was remarkably homogeneous, but the behavior across supermarkets was fairly heterogeneous. It turns out that most of the supermarket employees considered the store butcher to be the investment maven and would turn to him for advice.

(3) Risk Attitudes

Risk is a concept that denotes the negative impact to an asset or some characteristics of value that may arise from some process or future events. Risk normally involves the unknown future or uncertainty and its perception are essential factors for human decision making. Individuals have different risk attitudes and there are three types of risk attitudes as follows (Chavas, 2004):

(a) Risk aversion: a person is risk averse if he/ she is willing to pay a positive amount of money or positive risk premium to eliminate risk. This positive willingness-to-pay means that he/ she is made worse off by risk exposure.

(b) Risk neutral: a person is risk neutral if he/ she is made neither better off nor worse off when his/ her risk exposure is modified. A person will accept exactly the same interest rate for all assets.

(c) Risk seeking (or risk loving): it is a person who has a preference for risk. A person is a risk lover if he/ she must be compensated when his/ her risk exposure is eliminated. This means that he/she likes risk and is made worse off when risk is removed.

How does risk attitude of individual relate to the retirement saving decision? The retirement savings is money saved for future consumption when earnings from employment no longer exist. Intuitively, the retirement saving instruments offered to individuals should be the safe investment to ensure gains and reduce losses. In case of Thailand, much of personal savings are in form of bank deposits which individuals deem as a risk-free investment.

In addition, prospect theory by Kahneman & Tversky (1979) suggests that individuals make decision to maximize the s-shaped value function. The value function is (i) defined on deviations from the reference point; (ii) generally concave for gains and commonly convex for losses; (iii) steeper for losses than for gains. If a person is given two equal choices, one

expressed in terms of possible gains and the other in possible losses, people would choose the former – even when they achieve the same economic end result. Moreover, people exhibit the certainty effect when making choices in that they underweight outcomes that are merely probable in comparison with outcomes that are obtained with certainty. A certainty effect contributes to risk aversion in choices involving sure gains and to risk seeking in choices involving sure losses. Gain and losses in choices discussed here are defined by the amounts of money that are obtained. It can also be considered in terms of status quo or one's current assets [3]. The status quo is a reference point individuals use to measure gain and loss. This implies that the gains over status quo or current assets are likely to influence individuals' choices to invest and that they tend to be risk averse.

3. Data and Methodology

3.1 Data

Data is collected from experimental survey questionnaire, which is organized into four sections to collect the following information:

The first section consists of general information and demographic information of the respondents including age, gender, marital status and number of children (if any), and income level. In addition, this part includes question as well as their current investment in the three mutual fund asset management companies, including Kasikorn Asset Management, SCB Asset Management, and Krungthai Asset Management.

The second and the third sections of the questionnaire aim to measure the respondent's self-control and overconfidence level respectively. Self-control or self-discipline is assessed on planning and motivation to reach their goals. Overconfidence measures the respondent's self-assessment of their knowledge, their expertise, and their competency about retirement saving investment and decision. The five-point Likert scale will be adapted to identify the respondent's self-control and confidence in their own decision to choose the retirement saving option. The scale of one implies that the respondent has the least self-control and confidence or least expertise and five as the highest self-control and confidence level.

The last part will measure the respondent's degree of risk aversion. Frijns, Koellen, & Lehnert (2008) presented scenarios with realistic payoffs in order to assess degree of risk aversion. An individuals' risk aversion is obtained from ten simple lotteries that offer a choice between a less risky and the more risky lottery. The payoff for each lottery is selected such that the crossover point from less risky lottery to the more risky lottery provides an estimate of the individual's relative risk aversion coefficient. The lotteries will be set up in such a way that a crossover point from the less risky lottery to the more risky lottery after the fourth choices implies

risk-neutrality. All individuals who crossover before are relatively risk-seeking, and all individuals that crossover after are relatively risk-averse. The lotteries will be presented to the respondents in a randomized sequence, and the respondents will be asked to indicate their lottery preference. Probability will be presented as percentage chances to win either payoff.

3.2 Models

Separate Probit Models

According to the above framework, since dependent variables in this are binary choice variable with the value of 0 or 1, Probit models are applied.

$$y_1^* = x_1\beta_1 + \varepsilon_1, \qquad y_1 = 1 \ \ if \ \ y_1^* > 0, \ 0 \ \ otherwise$$
$$y_2^* = x_2\beta_2 + \varepsilon_2, \qquad y_2 = 1 \ \ if \ \ y_2^* > 0, \ 0 \ \ otherwise$$
$$y_3^* = x_3\beta_3 + \varepsilon_3, \qquad y_3 = 1 \ \ if \ \ y_2^* > 0, \ 0 \ \ otherwise$$

and

$$P(y_1 = 1 | x_1) = \Phi\left(y_1^*\right)$$
$$P(y_2 = 1 | x_2) = \Phi\left(y_2^*\right)$$
$$P(y_3 = 1 | x_3) = \Phi\left(y_3^*\right)$$

Where: y_1, y_2, and y_3, represent matrices of decision of choosing Kasikorn, SCB, and KTB respectively. x_1, x_2, and x_3, represent matrices of explanatory variables including (i) behavioral finance factors, self-control bias, overconfidence bias, loss aversion bias, mental accounting bias, and degree of risk aversion, (ii) perception of respondents on mutual fund asset management company (Kasikorn, SCB, and KTB), and (iii) control variables – demographic data. $\Phi(.)$ is cumulative normal probability distribution function. In these models, ε_1, ε_2, and ε_3 are all assumed to be independently jointly normally distributed with mean equal to zero and variance equal to one.

$$E\left[\varepsilon_1 | x_1\right] = E\left[\varepsilon_2 | x_2\right] = E\left[\varepsilon_3 | x_3\right] = 0$$
$$Var\left[\varepsilon_1 | x_1\right] = Var\left[\varepsilon_2 | x_2\right] = Var\left[\varepsilon_3 | x_3\right] = 1$$
$$Cov\left[\varepsilon_1, \varepsilon_2 | x_1, x_2\right] = 0$$
$$Cov\left[\varepsilon_1, \varepsilon_3 | x_1, x_3\right] = 0$$
$$Cov\left[\varepsilon_2, \varepsilon_3 | x_2, x_3\right] = 0$$

Thus, the three models are separately estimated by using maximum likelihood estimation method.

Multivariate Probit Models

However, the above separate probit models assume that all decisions are independently made which is inappropriate assumption. Multivariate probit models assume that all three decisions are made dependently and simultaneously. The models can be stated follows multivariate probit models as:

$$y_1^* = x_1\beta_1 + \varepsilon_1, \qquad y_1 = 1 \;\; if \;\; y_1^* > 0, \; 0 \;\; otherwise$$
$$y_2^* = x_2\beta_2 + \varepsilon_2, \qquad y_2 = 1 \;\; if \;\; y_2^* > 0, \; 0 \;\; otherwise$$
$$y_3^* = x_3\beta_3 + \varepsilon_3, \qquad y_3 = 1 \;\; if \;\; y_2^* > 0, \; 0 \;\; otherwise$$

and

$$P(y_1 = 1 | x_1) = \Phi\left(y_1^*\right)$$
$$P(y_2 = 1 | x_2) = \Phi\left(y_2^*\right)$$
$$P(y_3 = 1 | x_3) = \Phi\left(y_3^*\right)$$

In these multivariate probit models, ε_1, ε_2, and ε_3 are all assumed to be dependently multivariate normally distributed with mean equal to zero and variance equal to one.

$$E\left[\varepsilon_1 | x_1, x_2, x_3\right] = E\left[\varepsilon_2 | x_1, x_2, x_3\right] = E\left[\varepsilon_3 | x_1, x_2, x_3\right] = 0$$
$$Var\left[\varepsilon_1 | x_1, x_2, x_3\right] = Var\left[\varepsilon_2 | x_1, x_2, x_3\right] = Var\left[\varepsilon_3 | x_1, x_2, x_3\right] = 1$$
$$Cov\left[\varepsilon_1, \varepsilon_2 | x_1, x_2, x_3\right] = \rho_{12}$$
$$Cov\left[\varepsilon_1, \varepsilon_3 | x_1, x_2, x_3\right] = \rho_{13}$$
$$Cov\left[\varepsilon_2, \varepsilon_3 | x_1, x_2, x_3\right] = \rho_{23}$$

Where: ρ_{ij} represents correlation between error term of choice i and choice j.

The models are estimated by using Maximum Simulated Likelihood (MSL) estimation method.

4. Research Results

Empirical data are observed from 600 respondents of Thai investor using experimental survey questionnaire. Both models, separate probit and multivariate probit models are estimated using Maximum Likelihood Estimation (MLE) method and Maximum Simulated Likelihood (MSL) estimation method, respectively. The estimated results of separate probit and multivariate probit models are shown in Table 1 and Table 2, respectively.

Table 1: Estimated Results of Separate Probit Models

	Kasikorn	SCB	KTB
Perception	2.2545***	0.7451***	1.1233***
Overconfidence	0.8395**	0.8180**	0.5388**
Mental Accounting	0.2759**	0.6620**	0.4276**
Self-control	-0.0117*	-0.1405*	-*
Loss Aversion	-0.1092*	-0.7195*	-**
Risk Aversion	-0.0043**	-0.1488**	-**
Income>70m	0.4144***	0.2886***	0.3604***
Marital Status	0.2762*	0.2559*	0.1024*
with Children	0.5304**	0.5321*	0.4943**
Saving	0.2256*	0.0891*	0.1394*
Constant	-2.3235***	-1.6120***	-***
N	600	600	600
Log-likelihood	-326.22	-164.18	-
Chi-square Test	130.91***	28.351***	52.431***

Where:* is statistical significant at 0.1 ** is statistical significant at 0.05 *** is statistical significant at 0.01

According to the estimated results of multivariate probit models in Table 2, the estimated coefficients of correlations between each choice ($\hat{\rho}_{12}$, $\hat{\rho}_{13}$, $\hat{\rho}_{23}$) are all statistical significantly different from zero, indicating that the choices of three bank mutual funds are simultaneously decided. When making investing decision on mutual fund of the three banks, Thai investors make decision whether to invest in either Kasikorn, SCB, or KTB simultaneously at the same time, thus, multivariate probit models are more appropriated in this case.

Table 2: Estimated Results of Multivariate Probit Models

	Kasikorn	SCB	KTB
Perception	2.1397***	0.7403***	1.0575***
Overconfidence	0.8050*	0.7877*	0.6243*
Mental Accounting	0.2781**	0.6023**	0.4490**
Self-control	-0.1172*	-0.0155*	-1.1672**
Loss Aversion	-0.0779*	-0.6255*	-0.4525**
Risk Aversion	-0.0062**	-0.1476**	-0.1210**
Income>70m	0.4292***	0.2835***	0.3447***
Marital Status	0.2720*	0.2532*	0.0950*
with Children	0.5242**	0.5263*	0.5251**
Saving	0.2218*	0.1002*	0.1613*
Constant	-2.1388***	-1.5190***	-2.2977***
$\hat{\rho}_{12}$	-0.0703***		
$\hat{\rho}_{13}$	-0.4079***		
$\hat{\rho}_{23}$	-0.1430***		
N	600		
Log-likelihood	-749.31		
Chi-square Test	169.94***		

Where: * is statistical significant at 0.1 ** is statistical significant at 0.05 *** is statistical significant at 0.01

$\hat{\rho}_{12}$, $\hat{\rho}_{13}$ and $\hat{\rho}_{23}$ are the correlation of mutual funds between Kasikorn bank and SCB bank, between Kasikorn bank and KTB bank, and SCB bank and KTB bank respectively.

The estimated results indicate that investors' perception on asset management company with the highest value of the coefficient is the most influenced factor in determine their investment decision on each asset management company. Investors with good perception on any asset management company are more likely to invest in mutual fund of that asset management company.

The results also confirm behavior finance concept that investment decision is also influenced by behavioral and psychological factors of the investor. All behavioral finance factors, including Self Control, Overconfidence, Loss Aversion, Mental Accounting, and Risk Aversion all statistical significantly affect decision to invest in mutual fund of all asset management companies. Investors with high level of overconfidence or high level of mental accounting are more likely to invest more in mutual fund while those with high level of self-control, or loss aversion, or risk aversion are more likely to invest less in mutual fund.

Additionally, personal characteristics of investor are also significant factors in determining decision to invest in mutual fund of all three asset management companies. Investors who are married with children are more likely to invest more in mutual fund than those who are single or

married without children. High income (more than 70,000 baht a month) investors invest more in mutual fund compare to those with lower income.

The estimated results are according to what are expected by theoretical framework of this study confirming that not only traditional financial (risk-return) theory but also behavioral finance concept should both be applied in the choice models in determining decision to invest in mutual fund of the Thai investor.

5. Discussion and Conclusions

According to the above findings, the results indicate that behavior finance factors have significantly impacts on investment decision of investors, which is in line with the findings of Duflo & Saez (2002), Odean (1998), and Pompian (2012). Follow Mitchell & Utkus (2006), with hyperbolic discounters, investors are mostly undervalue the future benefits and overvalue the present benefit, thus, they are more likely to have self-control problems. The findings found negative significant impacts of self-control factors implied that investors with low level of self-control problem are more likely to save in long-term investment choice like mutual fund. Also, investor with high level of mental accounting can control themselves; thus, invest more on long-term investment mutual fund. According to Pompian (2012), overconfidence investors with overly optimistic assessment of their knowledge mostly believe they are better than others, thus, with overconfident bias they are more likely to invest more. The positive significant result confirms this overconfident bias of Thai investors. Based on prospect theory of Kahneman & Tversky (1979), investors' attitude toward risk are not symmetric with the shape like s-shape. The significant different values of estimated coefficients of loss-aversion and risk-aversion also help confirms this concept. As a result, all these evidences suggest that behavior finance factors play an important role in determining investment decision on investing in mutual fund of the Thai investor. Therefore, Thai mutual fund manager should be aware of these behavior finance factors when promoting their new products.

Additionally, perception on asset management companies of the mutual fund plays an important role in determining investment decision of respondents. Therefore, asset management companies should focus on their mutual fund performance and also building up their company image in order to motivation investors to invest in their mutual fund.

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