A COMPARISON OF PORTFOLIO DIVERSIFICATION OF THAI EQUITY FUNDS

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Abstract

Bank-affiliated equity funds have more business opportunity than nonbank-affiliated equity funds because the first group can implement its selling strategy via their commercial bank branches. This research compared the investment performance using portfolio diversification and characteristics of assets held between bank-affiliated and nonbank-affiliated equity funds that implemented the similar growth and value investing strategies. Statistics for data analysis were descriptive statistics with t-test for statistical difference test, analysis of variance, and regression analysis. Overall, bank-affiliated (42 funds) and nonbank-affiliated (24 funds) equity funds did not have any significant difference in investment performance. Both groups invested in large stocks about 90% of their asset values, while top-ten stocks occupied about 52-56% in their portfolios. For portfolio diversification, bank-affiliated and nonbank-affiliated equity funds had unsystematic risk of 28.22% and 33.54%, respectively. Therefore, both equity funds groups have administered approximately similar level of internal risk. Concerning the characteristics of assets held, a slight difference is evidenced where bank-affiliated equity funds have chosen to invest in smaller stocks, although their fund sizes are larger.

Keywords: Portfolio Diversification, Equity Funds, Investment Performance

Introduction

Financial independence usually starts from well-prepared savings. Investment on traditional banking accounts not only have low growth rate of capital value appreciation, but investors generally suffer from rising inflation (Thune, 2018: 2). For these reasons, other alternative investments for savings become more popular for investors to meet their desired financial goals. One of the most popular investing choices is equity mutual funds, which investors can potentially receive different yet higher returns according to their risk tolerance. To achieve their investing goal in equity funds, investors generally prefer good portfolio diversification managed by fund managers. The better risk diversification managed by institutional professions is among several advantages of investing in mutual funds over investing in particular stocks (ID Analysts, 2018: 2). Nonetheless, all investments including mutual

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funds have risks; and investors can bear risks differently (Dwyer, Gilkeson, & List, 2002: 151; Pandey, 2018: 9). It is critically important that investors must study objectives and characteristics of those mutual funds to determine those risks and their own risk acceptant levels. There are several types of mutual funds. Equity funds become the point of interest in this study because of their attractiveness from high long-term growth rate comparing to others. Typically, equity funds can be further categorized into bank-affiliated and nonbank-affiliated equity funds. Bank-affiliated equity funds might have more business opportunity from multiple-branch access to customers than those managed by the nonbank institutions. The first group can implement its selling strategy via commercial bank branches. Nevertheless, there is no guarantee that the bank-affiliated equity funds will outperform the nonbank-affiliated equity funds because of their higher business opportunity. As frequently cited by the financial press, portfolio managers of bank-affiliated equity funds have reputation of being less aggressive resulting in incapability of earning large returns (Frye, 2001: 419).

Research Objective

In this research, we compare investment performance of bank-affiliated and nonbank-affiliated equity funds that using growth and value strategy according to Baldridge (2018: 2) which operating in the Stock Exchange of Thailand on the followings: characteristics of assets held and portfolio diversification. The result from this research will provide the answer if better investment performance of equity funds exists, which will eventually leads to investment decision.

Literature Review

Many studies on investment performance focuses on risk as every investment has risk and return. There are several common measures of investment performance, the frequently used measures are Sharpe ratio, Jensen's alpha, Treynor ratio, the excess standard deviation adjusted return, residual variance, and information ratio. Some studies choose to use combination of selected measures, and a few choose to use all of the measures. Statman (2000: 38) studied investment performance between socially responsible mutual funds and conventional funds. This study used Jensen's alpha and excess standard deviation adjusted return (eSDAR) as measures of investment performance. The result showed that socially responsible mutual funds performed better than conventional funds under a control of equal asset size but their risk-adjusted returns were not statistically different. Bello (2005: 55) also investigated diversification of socially screened portfolios covered with characteristics of assets held by funds. The study used Jensen's alpha, Sharpe ratio, and eSDAR as investment performance measures including residual variance (RV) to measure a level of unsystematic risk. This research indicated that socially responsible mutual funds' performance was not significantly different from conventional

funds in term of any aspects. In addition, diversification of portfolio of the two groups of funds was not significantly different from one to the other. Bernardin & Dumoussaud (2013: 1) conducted a research on risk-adjusted financial performance of the Vice Funds (funds investing in sin stocks e.g. alcohol). They used Treynor ratio, Sharpe ratio, and Jensen's alpha to measure investment performance. The study found that the Vice Funds performed better on average return than the benchmark over the studied period regardless of the market conditions. Panwar & Madhumathi (2006: 1) studied investment performance by focusing on characteristics, portfolio diversification of mutual funds in India. Two types of mutual funds of varied assets were investigated; the public-sector sponsored mutual funds and the private-sector sponsored mutual funds. The result showed that the public-sector sponsored mutual funds were not significantly different from the private-sector sponsored mutual funds on average returns. However, there was a significant difference found between the two groups in terms of average standard deviation, average variance, and average coefficient of variation (CV). Furthermore, the result showed a statistical difference for excess standard deviation adjusted return (eSDAR) as a measure of investment performance. With respect to portfolio diversification using residual variance as a measure, there was a significant difference between different sponsored funds. The empirical result of Frye (2001: 420) showed that bank-affiliated mutual funds were more conservative than nonbank-affiliated mutual funds on the investment strategy. Nonetheless, in the aspect of risk, there was no significant difference in Sharpe ratio of the two mutual funds for any investment objectives. Hence, Frye concluded that bank-affiliated mutual fund did not underperform compared to the nonbank-affiliated mutual funds. Viriyabus (2002: 10) evaluated management of expected return for closed-end mutual funds of Thai commercial bank-affiliated funds and nonbank-affiliated funds. The result indicated that there was no significant difference on investment performance of the two groups by the measures of Sharpe ratio or Jensen's alpha. But a significant difference was found when Treynor ratio was implemented. With regard to risk measurement, the study revealed no significant difference in any of total risk, systematic risk, or unsystematic risk. Nevertheless, this study lacks of a comparison on information ratio of the two groups. Detpech (2016: 68) investigated on equity fund performance comparison between the bank-affiliated and nonbank-affiliated subsidiary mutual funds. This research concluded that the performance of mutual funds managed by banks were better than that of the ones managed by the non-bank institutions. The study revealed that bank-affiliated mutual funds had significantly higher Sharpe ratio and much lower risk than those of nonbank-affiliated mutual funds. In summary, many literatures found that investment performance of bank-affiliated and non-bank-affiliated mutual funds were not

significantly different despite of using different performance evaluation measures, namely, Sharpe ratio, Treynor ratio, Jensen's alpha, and excess standard deviation adjusted return. Nevertheless, a few literatures indicated a slight superior performance of mutual funds affiliated by banks. Forasmuch as aforementioned, it is interesting to research on portfolio diversification for the equity mutual funds with the growth and value investment strategy operating in the Stock Exchange of Thailand to fill in the missing literature gap.

Methodology

Data Collection

Net asset value (NAV) monthly data from January 2014 to December 2018 of equity funds which implementing a growth and value strategy as an active investment policy in the Stock Exchange of Thailand were collected. The equity funds were categorized into two groups; 42 bank-affiliated equity funds and 24 nonbank-affiliated equity funds.

Measurement of investment performance

Five alternative measures, namely, Jensen's alpha, α_p; Treynor ratio, T_p; Sharpe ratio, S_p; residual variance, RV; excess standard deviation adjusted return, $eSDAR$; and information ratio, IR were used to compare the investment performance of the equity funds groups. Jensen's alpha and Treynor ratio rely on beta as a measure of risk whereas the rest rely on standard deviation. S_p and IR rely on total risks, while α_p and T_p rely on systematic risk. Jensen's alpha can be estimated as:

$$r_p - r_f = \alpha_p + \beta_p(r_m - r_f) \quad (1)$$

where r_p is the monthly return on portfolio p, r_f is the monthly return on one-year government bonds for one-year risk-free asset holding, r_m is the monthly return on market, and β_p is the beta of portfolio p. r_f is used to calculate risk premium. For Treynor ratio, the estimation is:

$$T_p = \frac{r_p - r_f}{\beta_p} \quad (2)$$

Refer to Bello (2005: 55), residual variance of portfolio p (RV) can be estimated as:

$$RV = 1 - \frac{\beta_p^2 \sigma_m^2}{\sigma_p^2} \quad (3)$$

where σ_m^2 and σ_p^2 are the variance of returns on market and portfolio p, respectively. The residual variance was used for estimating the level of unsystematic risk of the portfolio. If the residual variance was high, then diversification of the mutual funds would be low. According to Sharpe (1994: 50), risk premium over total risks can be measured through Sharpe ratio as:

$$S_p = \frac{r_p - r_f}{\sigma_p} \quad (4)$$

Furthermore, Statman (2000: 38) indicated that the excess standard deviation adjusted return ($eSDAR$) is a modified version of Sharpe ratio and the equation is:

$$eSDAR = r_f + \left(\frac{r_p - r_f}{\sigma_p}\right)\sigma_m - r_m \quad (5)$$

The $eSDAR$ demonstrates excess return of the portfolio over the return of benchmark portfolio, where the portfolio is leveraged to have the standard deviation of benchmark. In addition, information ratio, IR was calculated following Israelsen (2005: 423). It is a measurement of portfolio returns beyond the returns of a benchmark compared to the volatility of those returns. It can be calculated as:

$$IR = \frac{r_p - r_m}{\sqrt{Var(r_p - r_m)}} \quad (6)$$

Following Bello (2005: 55), the data of the bank-affiliated and nonbank-affiliated equity funds groups were compared by using covariance analysis to investigate the differential impact of residual variance on investment performance. This selected method was a combined analysis of variance and regression altogether. Two advantages could be gained from this method; a test for significant difference of the means of portfolio performance can be undertook, and a test for significant difference of investment performance associated with difference in residual variance can be conducted. The model that links investment performance to the two independent variables; residual variance and type of funds, is:

$$y = \omega_0 + \omega_1 x_1 + \omega_2 x_2 + \omega_3 x_1 x_2 + \varepsilon \quad (7)$$

where

y = Investment performance of the portfolio,

x_1 = Residual variance,

x_2 = Combined analysis by group of funds (A = bank-affiliated equity funds, and B = nonbank-affi-liated equity funds), where x_2 = 0 if group B, and x_2 = 1 if group A,

ω_0 = The intercept of the two covariance analysis models,

ω_1 = The difference in investment performance between groups of equity funds

ω_2 = The difference in intercept of the two covariance analysis models,

ω_3 = The difference in slopes of the two covariance analysis models,

ε = The error terms.

According to the equation mentioned above, the expected values of investment performance for bank-affiliated equity funds are:

$$E(y) = (\omega_0 + \omega_2) + (\omega_1 + \omega_3)x_1 \quad (8)$$

And for nonbank-affiliated equity funds are:

$$E(y) = \omega_0 + \omega_1 x_1 \quad (9)$$

For this reason, ω_2 and ω_3 are the difference in intercept and slopes of the two covariance analysis models, respectively. According to these models, the difference in effect of residual variance on investment performance as a function group can be tested by testing

the null hypothesis: H_0: ω_3 = 0. After the residual variance effects are adjusted, the difference in investment performance between groups of equity funds can be tested by testing the null hypothesis: H_0: = ω_2 0. Lastly, from equation (9), a linear relationship between residual variance and investment performance for nonbank-affiliated equity funds can be tested by testing the null hypothesis: H_0: = ω_1 0.

Results

The summaries of a statistical difference t-test of bank-affiliated and nonbank-affiliated equity funds with growth and value strategy assuming unequal variance on their characteristics is shown in Table 1.

Table 1 A profile of bank-affiliated and nonbank-affiliated equity funds having growth and value investment strategy: January 2014 to December 2018

Deseription	Sample Mean		t-statistic
	Nonbank	Bank	
Panel A. Monthly Return			
Mean return	2.737	2.522	0.2008
Avg. standard deviation	11.655	12.349	1.8758*
Avg. coefficient of variation[a]	2.089	1.082	0.8089
Panel B. Portfolio Characteristic			
Net assets (M. Baht)	460.376	2,230.634	3.0306***
Common stock%	87.421	90.967	3.1566***
Bond%	2.364	1.677	0.6091
Capitalization (M. Baht)	116,823.223	99,013.064	1.8998*
Holdings	44.583	42.690	0.5999
Top ten%	56.489	52.131	2.3608**

Note: Common stock% and bonds% are percentage of common stock and bond investments of the fund's asset, respectively; capitalization is the median market capitalization of the companies held by the fund; holdings are the total number of companies held by the fund; and top ten% is the percentage of net assets invested in the fund's top ten holdings. The *t*-statistic are from a two-sample assuming unequal variances[a]. This is the average of the coefficient of variation of the funds in that group.

***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level by p-value statistics

The result indicated that bank-affiliated equity funds had net asset and percentage of common stock more than those of nonbank-affiliated equity funds with statistical significance. This means that bank-affiliated equity fund's size is statistically larger. On the other hand, nonbank-affiliated equity funds possessed larger market capitalization and percentage of net assets invested in the fund's top ten holdings. In other words, nonbank-affiliated equity funds held stocks with a slightly larger stock size than bank-affiliated equity funds did. Based on our result, we can conclude that equity funds affiliated by banks invested in stocks which were a bit smaller in stock size, although bank-affiliated equity funds had higher investment capital. On the other hand, nonbank-affiliated equity funds chose to invest in a bit larger stock size although they had lower investment capital.

Table 2 presents the result of performance measures of two group of equity funds by using t-Test: 2 samples assuming unequal variance. Although portfolio's beta between the two groups of funds have significant difference as represented by t-statistic of 3.2994, bank-affiliated equity fund's beta was higher than that of the other. Investment performance of bank-affiliated equity funds and nonbank-affiliated equity funds were not significantly different for all measures.

Table 2 Performance of bank-affiliated and nonbank-affiliated equity funds having growth and value investment strategy: January 2014 to December 2018.

Measure	Sample Mean		t-statistic
	Nonbank	Bank	
α_p	-0.0119	-0.0165	0.4389
β_p	0.8480	0.9392	3.2994***
RV	0.3354	0.2822	1.2670
S_p	0.1173	0.0942	0.2562
eSDAR	-0.0139	-0.0165	0.2562
IR	-0.2254	-0.2324	0.0801
T_p	0.0104	0.0084	0.1533

Note: Performance relative to SET index

***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level by p-value statistic

The result is consistent with Viriyabus (2002: 10), when Sharpe ratio and Jensen's alpha were used as the measures of investment performance. Our result is also consistent with Frye (2001: 420), who studied on bond funds and found no evidence that bank-affiliated mutual funds underperformed nonbank funds. However, our result differs from Detpech (2016: 68), who asserted that bank-affiliated mutual funds outperformed nonbank-affiliated mutual funds. For residual variance that represents portfolio diversification, bank-affiliated equity funds had lower residual variance (0.2822 or 28.22 %) than nonbank-affiliated equity funds (0.3354 or 33.54%). It means that bank-affiliated equity funds did better than nonbank-affiliated equity funds in term of investment diversification. Still, the difference between their residual variance was not statistically significant as indicated by relevant t-statistic when the SET index was used as the benchmark.

The correlation between measures of portfolio diversification and investment performance is shown in Table 3. The Sharpe ratio and $eSDAR$ were calculated based on total variance, hence, they should be negatively correlated with residual variance. The result suggested that not only Sharpe ratio and $eSDAR$ had significant correlation with residual variance. The other remaining measures also had a significant correlation with residual variance in negative way. This study further demonstrated lower portfolio diversification implying lower investment performance because residual variance shows how much diversifiable risk remaining in portfolio.

Table 4 shows the effect of diversification on investment performance. To test the effect of residual variance as a group function using H_0: $\omega_3 = 0$. Whether we use any measures as a measure of investment performance, the *RV**Group interaction term indicates that there is no significant difference in the effect of residual variance on investment performance as a function of groups when *RV* equals 1. The difference in investment performance between bank-affiliated and nonbank-affiliated equity funds, after the variable effects of diversification are adjusted, can be tested by using H_0: $\omega_2 = 0$. The result from Table 4 shows that there was no significant difference between bank-affiliated and nonbank-affiliated equity funds because of no difference in intercept.

Table 3 Pearson correlation of investment performance with diversification

Measure of Diversification	α_p	β_p	S_p	$eSDAR$	*IR*	T_p
Panel A. Nonbank-Affiliated Equity Funds						
RV	-0.802	-0.675	-0.816	-0.816	-0.809	-0.835
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Capitalization	0.383	-0.220	0.325	0.325	0.310	0.329
	(0.065)	(0.301)	(0.122)	(0.122)	(0.140)	(0.116)
Holdings	0.206	-0.189	0.192	0.192	0.173	0.214
	(0.335)	(0.378)	(0.368)	(0.368)	(0.419)	(0.315)
Top Ten%	0.032	-0.173	0.031	0.031	0.041	0.028
	(0.883)	(0.420)	(0.884)	(0.885)	(0.850)	(0.897)
Panel B. Bank-Affiliated Equity Funds						
RV	-0.702	-0.333	-0.724	-0.724	-0.723	-0.752
	(0.000)	(0.031)	(0.000)	(0.000)	(0.000)	(0.000)
Capitalization	0.005	0.332	0.014	0.014	0.037	0.039
	(0.977)	(0.032)	(0.928)	(0.928)	(0.814)	(0.804)
Holdings	0.016	-0.580	-0.029	-0.029	-0.070	-0.062
	(0.918)	(0.000)	(0.854)	(0.854)	(0.658)	(0.699)
Top Ten%	0.023	0.105	0.040	0.040	0.052	0.057
	(0.887)	(0.508)	(0.802)	(0.802)	(0.743)	(0.720)
Panel C. Combined Sample						
RV	-0.713	-0.463	-0.740	-0.741	-0.741	-0.770
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Capitalization	0.108	0.107	0.106	0.106	0.113	0.125
	(0.388)	(0.392)	(0.399)	(0.399)	(0.366)	(0.319)
Holdings	0.086	-0.447	0.054	0.054	0.020	0.045
	(0.491)	(0.000)	(0.665)	(0.665)	(0.875)	(0.720)
Top Ten%	0.041	-0.103	0.044	0.044	0.048	0.048
	(0.746)	(0.409)	(0.726)	(0.727)	(0.704)	(0.702)

Note: SET index is used as the benchmark portfolio. *p-values* are the numbers in parentheses.

***Significant at the 1% level, * Significant at the 10% level

Moreover, when H_0: $\omega_1 = 0$ was used to test the relation between residual variance and investment performance for nonbank-affiliated equity funds. This result, in line with the result from correlation analysis, indicated that residual variance was significantly related to all investment performance measures observing by linear relationship between residual variance and investment performance. We can then conclude that residual variance of nonbank-affiliated equity funds was linearly related to investment performance.

Table 4 Covariance analysis

Source	*df*	SS[a]	*F*-value	*p-value*
Panel A. Dependent Variable: α_p				
RV	1	0.059	70.083	0.000***
Group	1	0.000	0.187	0.667
*RV * Group*	1	0.000	0.308	0.581
Panel B. Dependent Variable: S_p				
RV	1	4.520	81.085	0.000***
Group	1	0.018	0.324	0.571
*RV * Group*	1	0.006	0.111	0.741
Panel C. Dependent Variable: ***eSDAR***				
RV	1	0.055	81.076	0.000***
Group	1	0.000	0.324	0.571
*RV * Group*	1	0.000	0.110	0.741
Panel D. Dependent Variable: ***IR***				
RV	1	4.073	79.434	0.000***
Group	1	0.009	0.177	0.675
*RV * Group*	1	0.007	0.128	0.722
Panel F. Dependent Variable: T_p				
RV	1	0.093	96.913	0.000***
Group	1	0.001	0.544	0.464
*RV * Group*	1	0.000	0.020	0.887

Note: The result of covariance analysis using general linear model. The dependent variable is investment performance, all calculate using SET index as the benchmark portfolio. The covariate is residual variance. *Group* is equal to 0 if nonbank-affiliated equity fund, and 1 if bank-affiliated equity fund. The interaction term is *RV*Group*, it indicates difference in the relation between residual variance and performance as a function of group.

[a]Sum of squares (SS) type III

***Significant at the 1% level

Discussion

The primary objective of this study was to investigate the difference in investment performance of bank-affiliated and nonbank-affiliated equity funds through portfolio diversification and characteristics of assets held. This paper has shown the result that the investment performance of the bank-affiliated and nonbank affiliated funds that show no significant difference. The result is consistent with the other studies. Because bank-affiliated equity funds could access to customers easier than non-bank-affiliated equity funds; therefore, their fund size is larger. Nevertheless, this was not the cause that bank-affiliated funds diversified their portfolios differently from non-bank-affiliated equity funds.

Conclusion

Essentially, bank-affiliated and non-bank-affiliated equity funds have not had any significant difference in investment performance. For portfolio diversification, bank-affiliated and nonbank-affiliated equity funds had unsystematic risk of 28.22% and 33.54%, respectively. The unsystematic risk is the risk which can be managed internally by fund manager. Therefore, both equity funds groups have administered approximately similar level of internal risk. Concerning the characteristics of assets held, a slight difference is evidenced where Bank-affiliated equity funds have chosen to invest in smaller stocks, although their fund sizes are larger. The result of this study was based on the limited total 66 bank-affiliated and nonbank-affiliated equity funds covering 5 years period. As generally known for dynamic of financial investment, the further study could be conducted for longer period of time especially during the unstable global situation.

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