

On the Relation between Fund Performance and Characteristics of Malaysian Unit Trust Fund

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This study examines the relation between fund performance and fund characteristics. The results show that funds' risk-adjusted returns are not significantly related to fund age and initial service charge and that riskier funds are able to generate higher returns which commensurate with their risk levels. The coefficients for expense ratio and portfolio turnover variables are not significantly different from zero. Since risk-adjusted returns are measured net of expenses, such findings are consistent with the arguments of the modified version of the efficient market theory. That is, fund managers are successful in making efficient use of resources to offset their expenses in acquiring and acting on new information. There is no evidence that fund size is related to funds' risk-adjusted returns. However, there is a strong evidence that the growth in fund size is negatively and significantly linked to fund performance, suggesting that as funds grow larger, they tend to become less efficient in their operations. A fund's investment objective is found to be an important factor in explaining the risk-adjusted returns. Additionally, this study finds that government funds have lower risk-adjusted returns than private funds but the economic significance of the relation is modest.

I. Introduction

In general, the activities of professional fund managers within the unit trust industry often involves a series of delegated process with investors increasingly delegating the management of their fund to fund managers. In recent years, there has been a sharp increase in the scale of delegated investing as readily evident from the size of asset under management.

In the Malaysian context, the total net asset value (NAV) of mutual fund or more popularly known as unit trust has risen from RM 43.3 billion to around RM 121.78 billion between 2000 and 2006, representing an increase of 181 percent.¹

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¹ Source: Federation of Malaysian Unit Trust Managers.

The growth can be attributed to the increasing investors interest in seeking inexpensive access to professional management of their funds. While the return of a given fund is generally observable by investors, the extent to which fund characteristics influences fund performance may not be obvious to the investing public at large. Given the increasing popularity of mutual fund as an investment vehicle for individual investors, it would certainly be of interest for investors to know how fund performance relates to fund's fundamental characteristics. More importantly, some of these fund characteristics are considered more subtle than others and may not be directly observable by investors. For example, the investment activities of managers such as their risk taking behaviors and their aggressiveness in managing funds somewhat reflects the characteristics of the funds that they manage. While these investment actions of fund managers are not directly observable by investors, these unobserved actions may have significant influence on fund performance. With the rising popularity of mutual fund investing among individual investors, the information on what fund attributes contribute to fund performance is more relevant than ever for investors facing with the decision of selecting fund for investment. The present study seeks to shed light on this issue in the Malaysian unit trust market.

Over the decades, many studies on U.S. and European mutual funds have examined the impact of fund attributes on fund performance. As with other areas of mutual fund studies such as the literature on the overall fund performance and timing and or selectivity performance of fund managers, the group of studies that link performance to fund specific characteristics have also reached contradictory conclusions.² Several factors that have been cited as possible causes of the conflicts include survivorship bias, different time periods, returns frequencies and choice of benchmarks. Nevertheless, some studies contend that the survivorship problem may not be severe when the study period is short.

Early study by Sharpe (1966) finds that funds with lower expenses tend to have better performance. However, the extensive work of Friend et al. (1970) published in a book, report no significant relation between performance and expense ratio and only a slight positive relation with turnover ratio. Ippolito (1989) finds that the risk-adjusted returns, net of fees and expenses of active portfolios are comparable to those of index funds and that fund performance is not related to portfolio turnover and management fees. In a subsequent study using fixed-effects model, Ippolito (1993) "resurrected" the study of Friend et al.

² In general, previous studies indicate that on average, mutual funds exhibit either negative or no abnormal performance. See Jensen (1968,1969), Sharpe (1966), Lehman and Modest (1984), Malkiel (1995), Otten and Bams (2002), Fortin and Michelson (2005), Ferreira et al. (2006) among others. Several other studies for examples Eun et al. (1991) and Kao et al. (1998) show that fund managers have good overall performance. A number of studies that decomposed the overall performance into timing and selectivity components have also reached mixed conclusion. See Merton (1981), Henrikson and Merton (1981), Lehman and Modest (1987), Volkman (1999), Rao (2000) among others. Parallel to the results reported in developed markets, empirical findings in Malaysia have shown either negative performance or no performance for the average unit trust funds. For examples, Mohamed and Nassir (1995), Leong and Aw (1997), Low and Ghazali (2005) and Low (2007).

(1970) on the relation between performance and turnover and investment fees. The results are the same as those reported by Friend et al. (1970), meaning that there is no significant relation between performance, net of expenses, and turnover and investment fees. Similarly, Grinblatt and Titman (1989, 1992) also report that mutual funds are able to generate sufficient returns to offset the expenses that they incurred. The findings of these studies are inconsistent with the so-called original version of efficient market theory (EMT, hereafter) which implies that expenditures of money on research and trading are wasted in a market in which securities prices already incorporate all available information. This version of EMT predicts that active management of fund will result in alphas equal to the negative of the expenses incurred in acquiring the information.³

As noted by Ippolito (1989), his findings that fund performance is not significantly related to turnover, management fee and expense ratio are consistent with the notion that mutual funds invest monies efficiently. It appears that funds with higher portfolio turnover, fees, and expenses do earn sufficient risk-adjusted returns to offset the higher charges involved. In other words, mutual funds are sufficiently successful in acquiring and implementing new information to offset their expenses. In his summary piece of mutual fund studies, Ippolito (1993) noted that such findings fit neatly into a modified version of efficient market theory. In this modified version, Grossman and Stiglitz (1980) did not discard the elements of EMT, instead they add a dynamic element into the model by taking into account the reality that information is not free.⁴ More recently, Fortin and Michelson (2005) in their study of international mutual funds, also find no relationship between performance and expense ratio. However, their results show a significant positive relationship between performance and turnover. Other studies that report a positive impact of portfolio turnover on performance include Grinblatt and Titman (1994), Dahlquist et al. (2000) and Wermers (2000). In contrast, there are studies that report significant negative impact of portfolio turnover and expenses on fund performance for examples, Malkiel (1995) and Carhart (1997). Elton et al. (1993) find that risk-adjusted returns are negatively related to expense ratios and turnover after taking into account the difference in performance between small capitalization non-S&P 500 stocks and S&P 500 stocks. Additionally, the work of Golec (1996), Otten and Bams (2002) and Dahlquist et al. (2000) also suggests that expense ratios are associated with

³ In the work of Fama (1970), the original version of the EMT suggests that information is free and is fully incorporated in securities prices. This implies that returns *before* subtracting investment and trading expenses are equal for both active and passive portfolios. Given this, research and trading expenses incurred to find and act on new information are therefore wasted.

⁴ Based on the revised EMT model of Grossman and Stiglitz (1980), it is expected that some investors expend resources to find and act on the new information. While these active investors earn higher gross returns, they also incur higher expenses. In equilibrium, the returns of both active and passive investors are equal *after* subtracting all investment and trading expenses. Even so, as noted by Ippolito (1993), the activity of finding and acting on new information actually benefits the market as a whole because such process contributes to driving the market toward values that reflect all available information.

negative fund returns.⁵ Collectively, the results of these studies are generally consistent with the original version of the EMT, suggesting that expenditures on research and trading are wasted in a market in which securities prices already incorporate all available information.

Droms and Walker (1994) in their study of international mutual funds, find that fund size is not significantly related to both unadjusted and risk-adjusted returns. Similarly, in a more comprehensive study using a cross-section/time series analysis over a 20-year period for 151 equity U.S. mutual funds, Droms and Walker (1996) report that fund performance is not related to asset size, turnover rate, or load/no load status, and that higher expense ratios are associated with higher returns. On a gross returns basis, Grinblatt and Titman (1989) find evidence of abnormal returns in smaller asset-size quintiles but net of expenses, the returns of funds in smaller quintiles are not significantly different from those of the larger quintiles. Otten and Bams (2002) find that larger fund assets are associated with higher returns and that fund age is negatively related to risk-adjusted returns. Fortin and Michelson (2005) also find that performance is positively related to fund size. Most recently, in a more broad-based study, Ferreira et al. (2006) use a large cross-section of international mutual fund from 19 countries between 1999 and 2005 to examine what fund attributes and country characteristics help explain the cross-section of fund performance. They find that country characteristics have better explanatory power than fund attributes in explaining fund performance. In particular, their study report that funds tend to perform better in countries with strong legal institutions and investor protection. Good performance occurs among large funds, high fee funds and young funds that invest abroad. Evidence of positive relationship between performance and fund size suggests the presence of economies of scale; large funds have the advantage of spreading fixed overhead expenses over a larger asset base which eventually lead to better performance.

In contrast, Dahlquist et al. (2000) in their study of Swedish mutual funds find that small equity funds, funds with low fees and high trading activity are associated with good performance. Chen et al. (1992) in their cross-sectional analysis of performance components show that size is positively related to selectivity but negatively related to timing performance. The results of Indro et al. (1999) suggest that while a minimum fund size is required to justify research and trading costs of mutual funds, the marginal returns to acquiring and acting on information become negative when mutual funds exceed its optimal fund size. This is because uncontrolled growth in fund size lead to several cost disadvantages that reduce fund returns. Their findings also indicate that blend (value-and-growth)

⁵ Given the findings that performance may be related to fund expenses, a number of other studies have examined the factors that affect fund expenses and the relationships between various expense components and total fund expenses. Malhotra and McLeod (1997) find that 12b-1 funds have higher expense ratios than non-12b-1 funds and that expense ratios are positively related to turnover but negatively related to fund size and age. For other similar studies on fund expenses, see Ferris and Chance (1987), Chance and Ferris (1991), McLeod and Malhotra (1994) among others.

and value funds have higher average net gains from information activities than do growth funds.

In the Malaysian context, prior research on unit trust has not addressed to what extent the performance of unit trust funds is related to fund characteristics. Since unit trust investing has become a much more important investment vehicle in recent years, it would certainly be of interest for investors to know how fund performance relates to fund's fundamental characteristics. The main focus of this study is to identify fund's fundamental characteristics that could help investors distinguish funds with superior or inferior performance. In particular, the characteristics that will be examined are: fund size, age, expense ratio, portfolio turnover ratio, initial service charge (front-end load charge), fund investment objective, fund riskiness and private/government fund status. This study proceeds as follows. Section II presents the data and methodology employed in the study. Section III discusses the findings and concluding remarks are offered in Section IV.

II. Data and Methodology

The data in this study is made up of sixty five unit trust funds and the returns on each funds is calculated using monthly net asset values from December 1999 through December 2004. The monthly return for each fund is calculated as follows:

$$R_t = (\text{NAV}_t - \text{NAV}_{t-1} + \text{DIST}_t) / \text{NAV}_{t-1}$$

where NAV is the net asset value and DIST is the income and capital gain distributions of the fund.⁶ The price record and distribution information were obtained from the local newspaper and annual report of the fund management companies. While there are several methods available for calculating risk-adjusted returns, this study employ the most widely used Jensen's model (1968,1969) with the following regression specification:

$$R_{jt} - R_{ft} = \alpha_j + \beta_j (R_{mt} - R_{ft}) + \epsilon_{jt} \quad [1]$$

Where R_{jt} is the rate of return of the fund at time t , R_{ft} is the contemporaneous rate of return on a risk free asset, R_{mt} is the rate of return for the market portfolio at time t . β_j is an estimate for the systematic risk level of the fund, α_j is the Jensen's performance coefficient, indicating the risk-adjusted performance of the fund, and ϵ_{it} represents the random error term. Monthly returns on the Kuala Lumpur Composite Index (KLCI) served as a proxy for the market's returns. The proxy for risk free rate is a three-month Treasury bill rate gathered from the

⁶ Because the monthly return of the fund is calculated based on the sum of distributions and the change in net asset values over time, the rate of return therefore reflects net return after the deductions of operating expenses, fees and transaction costs. The return is however gross of sales fees (load charges).

Monthly Statistical Bulletin, published by the Bank Negara Malaysia (Central Bank of Malaysia). Since the reported Treasury bill rate is an annualized holding period yield on a three-month Treasury bill, this rate is converted to a monthly equivalent, consistent with the monthly returns of the unit trust funds and the market's returns.⁷

To determine to what extent fund performance is related to fund characteristics, the alphas generated from the Equation (1) are regressed on fund characteristics variables in the following regression:

$$\begin{aligned} \alpha_j = & b_0 + b_1 \text{EXPENSE RATIO}_j + b_2 \text{PORTFOLIO TURNOVER}_j + b_3 \text{BETA}_j \\ & + b_4 \text{LN AGE}_j + b_5 \text{INITIAL SERVICE CHARGE}_j + b_6 \text{LN SIZE}_j \\ & + b_7 \text{GROWTH IN FUND SIZE}_j + b_8 \text{FUND OBJECTIVE}_j \\ & + b_9 \text{FUND TYPE}_j + \epsilon_j \end{aligned} \quad [2]$$

where α_j is the risk-adjusted return for fund j estimated from Equation 1; EXPENSE RATIO_j is the jth fund's management expenses ratio, which is the portion of the fund's average net asset paid for management fees, trustee fees, audit fee and other administrative fee involved in operating the fund; $\text{PORTFOLIO TURNOVER}_j$ is the portfolio turnover ratio for fund j, measured by the average total acquisition and disposal of securities for the year as a percentage of the average net asset value of the fund. The management expense ratio and portfolio turnover ratio capture the costs associated with the acquiring of and trading on information. The turnover ratio indicates whether fund managers buy and sell securities frequently or take a longer term approach to investing. This measure captures the active management of portfolio and thus the aggressiveness of fund manager in managing the funds. BETA_j represents the riskiness for fund j and is estimated using monthly return data from January 2000 through December 2004; LN AGE_j is the natural logarithm of the fund's age since inception until December 2004; $\text{INITIAL SERVICE CHARGE}_j$ is the jth fund's entry load and it represents charges or fees paid by investors when they buy into the fund; LN SIZE_j is the natural logarithm of the fund's end of the year total net asset value ; $\text{GROWTH IN FUND SIZE}_j$ refers to the percentage growth in fund assets over the previous year for fund j; FUND OBJECTIVE_j is dummy variable equals to 1 for aggressive funds and 0 otherwise. The two groups of funds are constructed by combining several finer classifications. Aggressive group includes funds with the objectives of growth and high growth. The remaining funds are funds with the objectives of income and income and growth; FUND TYPE_j is dummy variable equals to 1 if jth fund is a government fund and 0 otherwise. Funds are categorized into two groups, government funds and privately run funds; ϵ_j is the residual term for fund j. The data on fund characteristics are sourced from fund prospectuses, local newspaper and annual reports of the fund management companies.

⁷ The monthly equivalents of the annualized yield is estimated as a geometric mean, that is $(1 + \text{Annualized Yield})^{1/12} - 1$.

III. Empirical Results and Discussion

Given the potential interrelationships among the explanatory variables, Table 1 presents pairwise correlations for fund characteristics variables.⁸ The fund size variable is negatively and significantly correlated with expense ratio, portfolio turnover, fund age, beta and fund type dummy. Such correlations suggest that larger funds tend to trade less frequently and have lower expense ratios. As funds mature, they tend to shrink in size and also become less risky. It is also shown that the size of government funds is smaller than that of the private funds. Additionally, fund size is found to be positively correlated with the fund objective dummy. This suggests that aggressive funds with growth and high growth objectives are larger in size compared to those with the objectives of income and income and growth. As expected, portfolio turnover ratio is positively correlated with expense ratio, suggesting that higher trading activities lead to higher expenses. Although brokerage fees are not reflected in the fund expense ratios, frequent trading activities would require high research expenditures and thus, incur more operating expenses.

Table 1 further reveals that fund age is negatively correlated with fund objective dummy and portfolio turnover variables but positively correlated with the fund type dummy variable. This implies that matured funds have a more conservative investment objective than younger funds and that they tend to have less trading activities. The positive correlation between fund age and fund type further suggests that matured funds are very likely to be government funds. In addition, government funds are found to be more conservative in their investment policies compared to private funds as shown by a significant negative correlation coefficient of 0.55 between the fund type and fund objective dummies.

Table 2 reports the regression results of risk-adjusted returns on various fund characteristics variables.⁹ As shown, the fund characteristics variables explain slightly less than one-half of the variations in the risk-adjusted returns. The coefficients for expense ratio and portfolio turnover variables are not significantly different from zero. These results are consistent with the notion that fund managers

⁸ Since several pairs of independent variables have correlation coefficients that range from 0.30 to 0.55, a diagnostic measure for collinearity using the variance inflation factor (VIF) is employed to check for the presence of multicollinearity. As reported in Table 2, the diagnostic results show that none of the VIFs for any variables specified in the model has a value greater than 10. Therefore, it is concluded that multicollinearity is not a problem in the regression model.

⁹ The White's (1980) test is used to test for potential problems of heteroscedasticity and misspecification of the model's functional form. In White's test, the null hypothesis is a joint hypothesis, testing whether the model's specification of the first and second moment of the dependent variable is correct. The null hypothesis contends that the residuals are homoscedastic, independent of the explanatory variables, and that the model is correctly specified. As reported at the bottom of Table 2, the insignificance of the test result indicates that the regression model specified in the study shows no problem of heteroscedasticity and its functional form is correctly specified.

are successful in making efficient use of resources to offset their expenses in acquiring and acting on new information. As pointed out by Ippolito (1989, 1993), since risk-adjusted return is measured net of these expenses, if mutual funds expend resources efficiently, they should be able to generate high gross returns sufficient to offset the expenses involved; thus the expense and turnover variables should not be significantly different from zero. The findings of insignificant coefficients of these variables in the present study fit well into the arguments of the so-called modified version of the EMT.

The coefficient of Beta is positively and significantly related to fund performance and the result indicates that riskier funds are able to generate higher returns which commensurate with their risk levels. This study finds that fund's risk-adjusted returns are not significantly related to fund age and initial service charge. This suggests that fund performance has nothing to do with the number of years that the fund has been in existence. Although the risk-adjusted returns are gross of load charges, the upfront sales charge imposed on investors does not seem to affect fund performance.

As shown in Table 2, there is no evidence that fund size is related to funds' risk-adjusted returns. In contrast, there is a strong evidence that the growth in fund size is negatively and significantly linked to fund performance. This result could possibly suggest that as funds grow larger, they tend to become less efficient in their operations, implying that high growth rates seems to present managers with some challenges. As noted by Ciccotello and Grant (2001), as fund grows, managers are being pressured with the never-ending task of finding worthwhile investment opportunities. As a consequence, this causes strain in the capabilities of managers. Their findings show that for investors with aggressive investment objective, they are better off choosing smaller funds because asset growth is more difficult to manage in large funds with aggressive investment objective. The authors further argue that managers in these growing funds are losing their "nimbleness" as they find it difficult to get in and out of the market without signaling their intention. Similarly, according to Indro et al. (1999), the decline in returns for funds with high growth rate in assets reflects the implicit costs associated with the uncontrolled growth in fund size. For examples, administrative stress in hiring new people to accommodate growth, problems of coordination as fund gets larger, the lack of flexibility to trade freely without getting attention, as well as the opportunity costs of not entering or exiting the market when favorable market conditions prevail. The evidence of a significant negative coefficient of the fund growth variable in the present study, is consistent with the inefficiency arguments associated with growth in fund size.

Table 2 further reveals that fund's investment objective is an important factor in explaining the risk-adjusted returns. The result indicates that on average, aggressive funds with the objectives of growth and high growth have significantly lower returns than funds with the objectives of income, and income and growth. The lower performance could possibly reflect the inefficiencies of managers in

managing funds with growth and high growth objectives. Managers of funds with such investment objectives tend to be aggressive in expending money on research and trading activities and their aggressiveness could well work against them if resources are not utilized efficiently. The result suggests that managers of this so-called aggressive funds do not seem to be successful in their effort to search for and trade on new information. The returns generated by these managers are not sufficient to cover the additional research and trading costs associated with their aggressive investment behaviors. Hence, this could potentially explain the lower risk-adjusted returns for these aggressive funds compared to those conservative funds with the objectives of income, and income and growth. In other words, on average, funds in the growth and high growth category may have over-invested in information for security analyses and trading activities. With regard to fund type, the dummy variable has a negative coefficient, suggesting that the risk-adjusted returns of government funds tend to be lower than those of private funds although the economic significance of the relation is modest. An intuitive explanation for such finding is that, privately run funds are more likely to have better rewards and incentive plans for their fund managers than do government funds. Therefore, managers of privately run funds are likely to be more motivated to perform well compared to the managers of government funds.

IV. Conclusion

This study examines the relationship of fund characteristics and fund performance. Since unit trust investing has become a much more popular choice for investors, it would certainly be of interest for investors to know how fund performance relates to fund's fundamental characteristics such as fund investment objectives, fund size, age, expense ratio, portfolio turnover ratio, initial service charge (load fee), fund riskiness and private/government fund status. Using monthly returns for a sample of sixty-five unit trust funds from January 2000 through December 2004, this paper employs the Jensen's model (1968,1969) to calculate risk-adjusted returns of funds. The estimated performance is then used in a cross-sectional regression of risk-adjusted returns on fund characteristics variables. The results indicate that funds' risk-adjusted returns are not significantly related to fund age and initial service charge and that riskier funds are able to generate higher returns which commensurate with their risk levels. This paper finds no significant relation between performance and expense ratio and portfolio turnover. There is also no evidence that fund size is related to funds' risk-adjusted returns. However, there is a strong evidence that the growth in fund size is negatively and significantly linked to fund performance, suggesting that as funds grow larger, they tend to become less efficient in their operations. The findings further indicate that funds with the objectives of growth and high growth have significantly lower returns than funds with the objectives of income, and income and growth. Additionally, government funds have lower risk-adjusted returns than private funds but the economic significance of the relation is modest.

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Table 1: Pairwise Correlation Coefficients of Independent Variables

This table reports pairwise correlation coefficients for fund characteristics variables. The variables include: management expense ratio, in percentage (EXPENSE RATIO); portfolio turnover ratio in percentage (PORTFOLIO TURNOVER); fund's riskiness (BETA); fund age, measured in logarithmic term (LN AGE); fund's entry load, in percentage (INITIAL SERVICE CHARGE); fund size, measured as the natural logarithm of the fund's total net asset value (LN SIZE); growth in fund assets over the previous year, in percentage (GROWTH IN FUND SIZE); fund objective dummy variable that equals one if fund has the objectives of growth and high growth, and zero otherwise (FUND OBJECTIVE); fund type dummy variable that equals one if fund is a government fund and zero otherwise (FUND TYPE).

	1	2	3	4	5	6	7	8	9
1-EXPENSE RATIO 0.02	1.00	0.30*	-0.01	0.12	-0.05	-0.36**		0.02	-0.18
2-PORTFOLIO TURNOVER -0.15 0.15			1.00	0.15	-0.27*	0.14	-0.34**		0.16
3-BETA 0.13 0.12						1.00	0.18	0.20	-0.29*
4-LN AGE 0.36** 0.42**				1.00	0.02	-0.46**		0.18	-
5-INITIAL SERVICE CHARGE -0.20						1.00	0.01	-0.05	0.11
6-LN SIZE 0.53**						1.00	-0.21	0.38**	-
7-GROWTH IN FUND SIZE							1.00	-0.15	0.23
8-FUND OBJECTIVE -0.55**									1.00
9-FUND TYPE 1.00									

Notes: ** and * denote statistical significance at the 0.01 and 0.05 levels.

