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Are Fund Managers Skilled or Is It Simply Luck? A Case of Energy Mutual Funds

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Abstract

Fund managers often tout that the performance of the funds they manage is due to their wisdom and management skills. The success in convincing the investors to this notion enables them to claim a higher salary and perks for themselves and charge a hefty or premium fee from the investors for the company they work for. However, changes in government policies, as well as in domestic and international market conditions, often influence the performance of the funds they manage. Suppose investors are not aware of this phenomenon. In that case, they may end up unnecessarily paying a hefty fee to the fund managers and investing in the wrong stock or mutual fund thereby suffering a loss in terms of the return on investment and capital loss. So, the investors must know whether the performance of any funds is due to the wisdom or skills of the fund managers or simply due to some exogenous factors beyond their control, which, in this study, we call luck. In this study, we apply the so-called Fama and French's bootstrap simulation method to determine whether the observed value of alpha – a measure of the fund's performance – is due to fund managers' skill or simply luck using data on monthly returns of the fifteen Equity Energy mutual funds from January 2024 through June 2019. This method involves computing a distribution of t(alpha) estimates of actual fund returns and comparing it to the performance of a cloned population of lucky funds with their true alphas set to zero. If actual funds produce higher values of t (alpha)s than the cloned population of lucky funds, then fund managers do have the skill. This distinction between skill and luck is crucial, as funds can do well or poorly by luck.
Our study shows that funds can produce extreme alpha values just by luck, even if the fund's true alpha is zero. This implies that long-term investors are better off holding market portfolio ETFs and earning market return rather than paying more in fees and overall costs in attempts to beat the market.

JEL classification: G1

Keywords: Equity energy, mutual fund performance, Fama and French, Bootstrapping, luck vs skill, active management, Carhart four-factor model.

1. INTRODUCTION

Fund managers often tout that the performance of the funds they manage is due to their wisdom and management skills. The success in convincing the investors to this notion enables them to claim a higher salary and perks for themselves and charge a hefty or premium fee from the investors for the company they work for. However, the performance of a fund does not solely depend on the wisdom or skills of fund managers; rather, a change in government policy and domestic and foreign market

conditions also significantly affect the performance of a fund. For example, suppose the U.S. government, in its attempt to boost domestic production, introduces a policy – an example being the Inflation Reduction Act – under which cash subsidy is offered to domestic or foreign producers of the product the government wants to promote, then the prospects of making profit increases for the related companies, which raises the demand for stocks of those companies thereby growing the fund's price and earning a capital gain to the investors of those companies. Similarly, suppose the Federal Reserve exercises a quantitative tightening policy, thereby lowering the return on Treasury Securities and raising the comparative return on stocks, which in turn may raise the demand for stocks, pushing the stock prices up and yielding capital gain to the investors in the stock market. Similarly, a change in foreign government policy or market condition can influence the rate of return on funds at home. So, the better performance of stock funds, in the above examples, is not due to extraordinary wisdom or skills of the related fund managers, rather it is simply due to the exogenous factors beyond the control of the fund managers, which we call luck. If investors are not aware of this phenomenon, they may end up unnecessarily hefty fee to the fund managers and investing in a wrong stock or mutual fund thereby suffering a loss in terms of the return on investment and capital depreciation. So, it is really important for the investors to know whether the performance of any funds is due to the wisdom or skills of the fund managers or simply due to some exogenous factors beyond their control, which, in this study, we call luck. In this study we apply the so-called Fama and French's bootstrap simulation method to determine whether the observed value of alpha – a measure of fund's performance – is due to fund managers' skill or simply luck using data on monthly returns of the fifteen Equity Energy mutual funds from January 2024 through June 2019.

The paper is organized as follows: Section 2 reviews the relevant literature in the field, Section 3 describes the methodology, Section 4 presents data, Section 5 discusses the empirical findings, and Section 6 draws the conclusion.

2. LITERATURE REVIEW

Earlier research by Rao *et al*. (2019) on mutual fund managers' performance has produced mixed results. Other studies, such as, those by Carhart (1997), Christopherson *et al*. (1998), and Hendricks et al. (1993) have shown some evidence of positive abnormal performance. Yet other studies, such as, those by Malkiel (1995) and Cumby & Glen (1990) have presented stronger evidence of funds performing poorly. Similarly, a study by Kosowski *et al*. (2006), using a bootstrap technique, found evidence of stock-picking skills and superior fund performance attributed to fund managers. Fama and French (2010), in their study, presented evidence of the positive and persistent performance of funds, which brings very high rates of return to investors. However, recent studies by Cremers *et al*. (2012) & Angelidis *et al*. (2013) have shown that alphas obtained from multi-factor models can misstate skill because

they ignore the managers' self-reported benchmark in the performance evaluation process.

Our study will significantly contribute to the existing research and literature in the field in many respects. First, we apply a simulation method to generate several samples from one sample, saving time and money involved in collecting a very large sample. Second, this method is immune to the value of outliers in the sample. Third, since this method analyzes a large number of samples, it produces more accurate estimates of sample mean, standard deviation, and distribution leading to a more accurate conclusion. Finally, the method we apply in this study has never been used in studying energy mutual funds.

3. METHODOLOGY

This study analyzes a portfolio of actively managed US energy equity mutual funds using the Fama-French-Carhart (F-F-C) methodology stated as following:

$$R_{it} - R_{ft} = \alpha_i + b_i(R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + m_i MOM_t + e_{it} \quad (1)$$

where, $R_{it}$is the rate of return on the i[th] fund in the t[th] month, R_{ft} is the risk-free rate of return (i.e. the rate of return on 1-month U.S. Treasury bill), R_{mt} is the market rate of return (i.e. the return on fund indices, such as, VW portfolio of NYSE, Amex, and NASDAQ stocks), SMB_t and HML_t are the size and value-growth returns of Fama and French, MOM_t is Carhart's momentum return. Thus $R_{it} - R_{ft}$ is the excess of return on the i[th] fund over the return on 1-month U.S. Treasury bill. Similarly, $R_{mt} - R_{ft}$ is the excess of market return over the return on 1-month U.S. Treasury bill. Since market rate of return also includes rate of return on individual (i[th]) fund, $R_{mt} - R_{ft}$ is expected to have a positive influence on the dependent variable, $R_{it} - R_{ft}$ and, therefore, the coefficient, b_i is expected to have a positive sign. Also, other independent variables, such as, SMB_t, HML_t and MOM_t are the rate of return on other benchmark funds. A higher rate of return on these benchmark funds puts pressure on individual fund managers to also show a higher rate of return in order to survive in the market.

Therefore, these fund indices are also expected to have a positive influence on the rate of return on individual funds, i.e. on variable, $R_{it} - R_{ft}$. In other words, coefficients associated with these independent variables, such as, s_i, h_i and m_i, are also expected to have a positive sign. Furthermore, α_i and e_{it} represent the mean effect and random effect respectively of all factors that can affect the dependent variable but are not included in the model, including the skill and wisdom of the fund manager of the i[th]

fund. So, a statistically significant and positive value of alpha will indicate that individual fund manager's skill has really contributed to the rate of return on that fund; otherwise any positive rate of return on individual fund is only due to the luck of (i.e. external factors beyond the control of) fund managers. In other words, a positive value of α_i indicates that the fund manager is able to accurately forecast the return on the fund exhibiting his/her skills in choosing the right stocks to be included in the fund and in managing the fund. An insignificant value of alpha, on the other hand, indicates that a higher rate of return on the fund managed by the fund manager is simply due to luck, in other words, due to external factors beyond the control of the manager. However, in order to find out whether the alpha calculated from the observed sample is statistically significant or not, we must know the theoretical distribution of the collected sample. To that end, we applied the Bootstrap method that obtains the theoretical distribution by generating several samples out of the collected sample using a simulation technique and then evaluating all those simulated samples.

Bootstrap distribution

Under this method, the first bootstrapped distribution of t(alpha)-statistics for several selected funds is examined. Next, zero-alpha funds are identified by subtracting their in-sample alpha estimate from their returns (following the FF approach). Following that, it is examined whether the actual performance (i.e. t(alpha)) falls within the distribution of t(alpha) in one thousand bootstrap sample returns. Finally, the percentile rank of the actual performance within the bootstrap distribution is calculated. If the actual performance of the fund lies within the lower percentiles of the bootstrap distribution, it suggests that luck could explain the performance. Conversely, if the actual performance lies in the upper percentiles of the distribution, it implies that skill might have played a significant role.

4. DATA

Our study examines the data on the returns of the S&P500 index over the period 2019-2024. We chose this period for our investigation to capture the volatility in the index's return over the period. For example, the return on the S&P500 index was 10.64%, 24.3%, -19.44%, 26.89%, 16.26%, and 28.88% in the years 2024, 2023, 2022, 2021, 2020, and 2019, respectively. We obtained the F-F-C data and risk-free rate for January 2024 through June 2019 over 56 months from the Fama data library. However, we only included those fifteen Equity Energy mutual funds with at least 56 monthly returns data published on the Yahoo website.

5. EMPIRICAL FINDINGS

The regression estimation of equation-1 yielded the following estimated equation.

$$R_{it} - R_{ft} = \alpha_i + b_i(R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + m_i MOM_t + e_{it} \quad (2)$$

t-value = (-0.12) (7.31) (0.84) (7.32) (-0.34)

R^2 = 0.889781; Adjusted R^2 = 0.719771

Both R^2 values indicate that the regression estimates fit the data well, as more than 70% of the variation in the dependent variable is explained by the regression equation, in other words, by independent variables included in the model. The values suggest that the independent variables, $R_{mt} - R_{ft}$ and HML_t are statistically significant with the t-value of 7.31 and 7.32 respectively. This means that these two independent variables positively influence the performance of individual funds (i.e., rate of return on). However, our interest is in the intercept term, α_i. The t-value associated with the intercept term is -0.12, which means the intercept term is not statistically significant. This, in turn, means that the mean effect of individual fund manager's skill has no contribution in the performance of individual fund.

6. CONCLUSION

The study uses the portfolio's alpha to evaluate an active fund manager's performance. We begin our empirical analysis by examining the overall or collective performance of the funds. We use an equally weighted (EW) portfolio of all the 15 funds in our sample. In other words, we form one 'portfolio' of mutual funds where each fund has an equal weighting. We then use the aggregated version of the US 15-equity mutual fund universe as a dependent variable in an OLS regression, where the independent variables are the four appropriate factors of the F-F-C performance model. The regression allows us to comment on the alpha generated by the 15-equity mutual funds over time. The detailed regression results are presented in Table 1. As it is evident from the table, the equally weighted F-F-C alpha for all funds is -.0982% per month with a t-statistic of -.11973. These results are consistent with the findings reported in the literature, for example, in the study by Fama and French (2010). However, we present these results to only provide a basis for comparison with subsequent analysis across other equity funds. Our study finds, based on the data from 6/1/2019 to 1/1/2024, that the aggregate active fund portfolio underperformed by 0.0009816 (or .09816 percent) per month or resulted in negative performance by 0.0117 (or 1.17%) per year. Then, our study employs a bootstrapping approach to separate luck from skill and finds no evidence that there is any significant advantage out of active management (which strives for superior returns, takes more significant

risks, and charges larger fees to outperform the market index) compared to passive management (with a nontrivial amount of trading) that replicates a market index to match its performance. Our Bootstrap simulations also find that funds can produce extreme alpha values just by luck, even if the fund's true alpha is zero. Based on 1000 bootstrap simulations, the percent rank of t(alpha) of - 0.11973 is 0.449, meaning 55.1% of the cloned population of lucky funds did better than the E-W portfolio.

This study implies that long-term investors are better off just holding the market portfolio ETFs and earning a market rate of return rather than paying more in fees, believing that funds managers who charge a hefty fee are more skilled in predicting the rate of return on various stocks and skilfully choosing the right stocks to be included in the funds they manage. Out findings have also been substantiated by the studies by other researchers, such as Sharpe (1991 & 2013).

This study does not involve any ethical issues as no funding has been obtained to conduct this research, and all data used in this study have been obtained from open sources. Also, all reviewed and cited studies have properly been referenced.

However, this study also has some limitations in the sense that it is based on data for period, January 19, 2019 to January 1, 2024, which is characterized as a volatile period. So, a similar study over a different period of time might have produced a different result. Also, we recommend that future studies concentrate on fund performance in other sectors (i.e. other than energy sectors) and then compare if similar findings are also evident in the performance of those other sectors.

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