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Montenegrin Journal of Economics

Citation:

Kurbatskii, A. (2022), "Active Strategy and Other Key Factors of Mutual Funds' Performance", *Montenegrin Journal of Economics*, Vol. 18, No. 3, pp. 99-107.

Active Strategy and Other Key Factors of Mutual Funds' Performance

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ARTICLE INFO

Received December 04, 2021
Revised from January 09, 2022
Accepted February 10, 2022
Available online July 15, 2022

JEL classification:

G11, G12, G14, G15, G17.

DOI: 10.14254/1800-5845/2022.18-3.8

Keywords:

Mutual funds;
bond yields;
active strategy;
managerial skill;
fund's alpha.

ABSTRACT

The demand for mutual funds is determined by their ability to convince investors to achieve their investment goals. Whether mutual fund managers can collect and analyze existing information in such a way as to select assets that entail returns above the market or not, that is a very significant question for both financial industry theorists and practitioners. To compare funds with active strategies and passive ones we use panel data models with the excess return over the benchmark as a dependent variable. Our sample was constructed from US funds over 14 years of observations from 2006 to 2019. We include funds which invest mostly in different US sectors with SP500 as the benchmark. It turns out that active funds don't give significant benefit. Nevertheless, the significance of the spread between long term and short-term US government Treasury bonds yield confirms that the actively managed funds gain more on the expectation of the market's growth than the passive ones.

INTRODUCTION

Mutual funds allow to accumulate funds of private investors who prefer to leave the management of their assets to professional managers. The popularity of mutual funds among US citizens provides urgency to the issue of improving their functioning. The industry has seen steady growth over the past 25 years, driven by stronger demand from households, supported by improved wealth, an aging of the American population, and the evolution of the retirement system.

American mutual funds are truly diverse, they are classified based on strategic orientation: equity, bond, cash and hybrid funds. With the advent of new market instruments, the level of popularity of funds has changed, but most of the assets of mutual funds are held by equity funds (Figure 1).

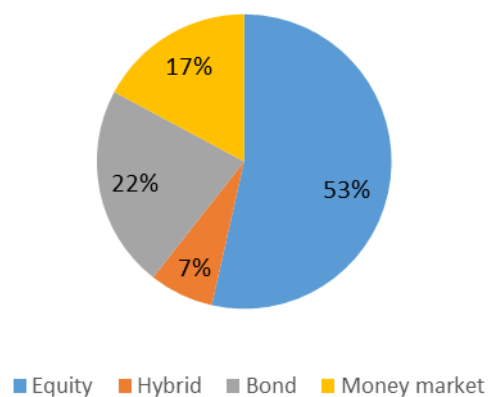


Figure 1. Structure of the US Mutual funds in 2020.

Source: 2020 Investment Company Fact Book (https://www.icifactbook.org/ch3/20_fb_ch3)

With this development of the industry, it is reasonable to assume that some of the funds will beat the market index to a large extent simply due to a happy combination of circumstances.

However, there will also be those whose super-profitability is determined by several factors, both structural and temporal. For the practitioners, the solvency of mutual funds as investment institutions determines the choice between active and passive management of the investment portfolio. From the theoretical point of view, the answer to this question is an argument: for or against the validity of the efficient market theory.

Attempts to improve the performance of mutual funds by varying their individual characteristics may, firstly, be insufficient, and secondly, may have multidirectional consequences, which are undesirable for both individual investors and managers. Moreover, traditionally used methods, such as CAPM model and its subsequent modifications, see (Fama and French, 1993, 2015), do not provide a parametric assessment of the impact of macroeconomic indicators on the mutual fund's yield. The particularity of modifications of the multi-factor benchmark model is that when analyzing excess returns, we use the estimated market index, instead of its real value. While in fact, choosing between investing in the market portfolio and mutual Fund, individual investor rather compares the fund's yield with the yield of the declared benchmark. The recent paper (Artamonov et al., 2020) examines the impact of US government Treasury bonds yield on the return of mutual funds.

In the current study we discuss the problem of identifying the fund's strategy and using panel data model try to estimate impacts of the spread between 10-year and 3-month US Treasuries on funds' alpha and compare funds with active and passive strategies.

1. BACKGROUND

A significant part of researchers agrees that actively managed funds, on average, lose to the benchmark. As a part of this approach, the authors resort, among other things, to various ways to estimate the stability of deviations (both positive and negative) of mutual fund returns from market returns.

There are also a lot of studies on the sustainability of the results of American funds. Even back to 1997 M. Carhart argued that the super-profitability of funds is not associated with the outstanding abilities of mutual Fund managers, but simply with their luck. However, modelling and identifying this luckiness is not an easy task (Carhart, 1997). At the same time, most proponents of the theory of efficient market, and, consequently, passive management, support their position by the existence of Commission fees and management costs, which make an additional contribution to reducing the efficiency of mutual funds relative to the market. In the paper "Active vs. passive, the case of sector equity funds" (Fan and Lin, 2020) wasn't found considerable evidence that actively managed sector mutual funds outperform their passive counterparties. Authors decide that U.S. sector equity market has become more efficient in

the last 10 years. In (Crane and Crotty, 2020) there is an interesting suggestion that no risk-averse investor should choose a random active fund over a random index fund according to stochastic dominance tests.

Another camp of researchers with opposite point of view, for example, (Henrikson, 1984), (Goetzmann and Ibbotson, 1994), postulate that past returns can serve as a predictor for future returns of mutual funds, thus completely rejecting the theory of an efficient market. (Cremers and Petagisto, 2009), argue that higher activity of the management team corresponds to higher future returns. Moreover, higher activity signals new investment concepts and thus is a proxy for investor skills. The existence of managerial skill was discussed in (Berk and van Binsbergen, 2015).

Let us look at the difference in performance between the income of actively managed funds investing in large-cap companies without a focus on any management style (value, growth, etc.) and passive funds (Figure 2).

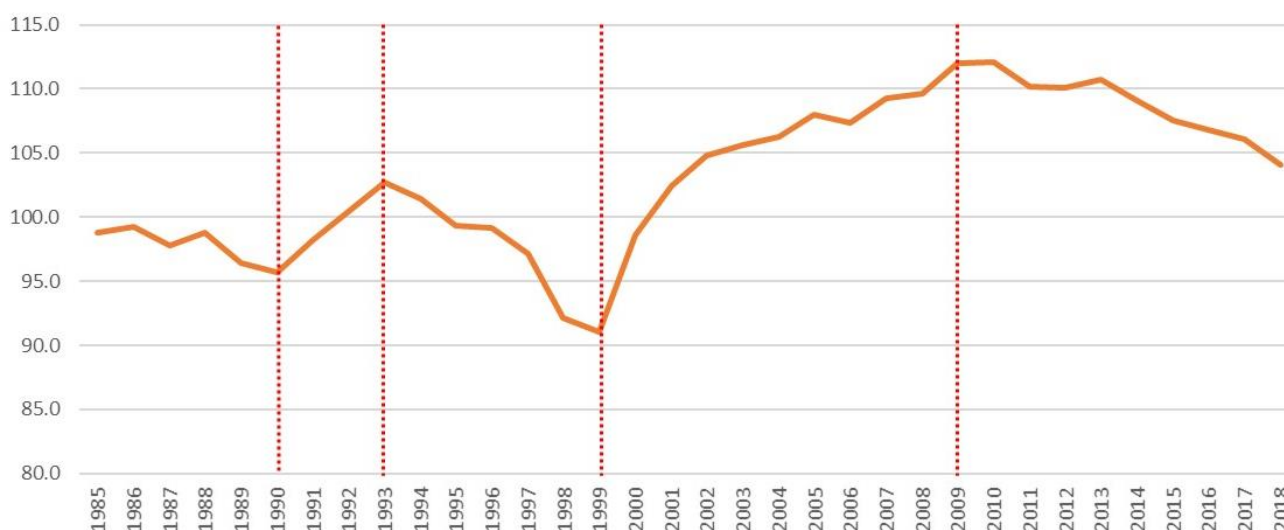


Figure 2. Active Large Blend versus Passive Funds: Relative Return

Source: Harding Loevner; Data source: Morningstar (<https://www.activemanagers.com/amc/insights/more-balanced-narrative/active-managers-dont-outperform-empirical-argument>)

We see that the results of active funds relative to passive ones have a clear cyclical nature: long periods of outperformance are replaced by long periods of underperformance. These dynamics go against the efficient market theory.

An interesting approach is suggested by (Kosowski et al., 2006). They find that 10% of the best funds in terms of performance relative to the benchmark have such results due not to luck, but to the presence of skill. Their results suggest that only 9 funds out of 2118 would beat the index by more than 10% a year (without expenses and commissions) if managers did not have the ability to use the inefficiency of the stock market to their advantage. In reality, 29 funds were able to beat the index by this amount, which is more than three times higher than the value revealed by luck modeling.

2. IDENTIFYING A STRATEGY

If researchers are supporters of passive or active mutual Fund management, they must first look for ways to assess the nature of the investment organization's strategy. It is easy to define a passive strategy: it consists of buying market assets in the same proportion as the market portfolio. Active management refers to any strategy that deviates from the passive one. However, measuring this "deviation" is

not an easy task. The authors approach this problem from different angles based on what aspect of active management they are trying to highlight. Some even call the active management as a "selectivity".

Two approaches are used to identify the activity of mutual Fund management: first is based on the analysis of returns, and the second one is based on the analysis of the investment portfolio assets. The latter is characterized by determining the activity of the Fund's strategy as the degree of deviation of the Fund's assets from the set of assets of the market portfolio (benchmark).

As for the approach based on the analysis of mutual Fund returns, the most commonly evaluated is the extraordinary volatility of returns. Another traditionally used measure of Fund activity is the tracking error (TE), which shows the variance of the difference between the returns of the Fund's portfolio and the benchmark.

The tracking error depends on different factors:

- the degree of similarity of the asset structure in the Fund's and benchmark's portfolios,
- changes in market capitalization, investment style, macro environment, and other fundamental characteristics of both the Fund and the market index,
- fees charged, management expenses (which the market portfolio does not have),
- market volatility,
- beta of portfolio, and
- inflows and outflows of funds from investors that force managers to review their investment portfolio.

This indicator is convenient because the researcher does not need to know information about the structure of the investment portfolio at any given time and it is understandable for every stock market participant. The approach of tracking the portfolio structure, although it requires a high degree of detail and access to information that is not publicly available, has been widely developed among researchers of indicators of active mutual Fund strategy. (Kacperczyk et al., 2005), for example, use "index of concentration in the industry", and (Cremers and Peajisto, 2009) – use "active share". First consider the performance of funds as an increasing function of the Fund's activity, calculated as the sum of the squares of deviations of the Fund's investment shares in various industries from the corresponding shares in the market portfolio. Second are based on the belief that the active strategy of the Fund consists of two components: a special approach to the selection of assets and/or specific strategies based on the analysis of systemic risk factors. Usually, funds tend to use one of these approaches, so it is difficult to specify a universal way to identify an active strategy. The authors suggest using a combined approach as an indicator of an active strategy. One of the components is the active share, which is calculated as a part of the portfolio different from the market share:

$$\text{Active Share} = \frac{1}{2} \sum_{i=1}^N |w_{fund,i} - w_{index,i}|$$

Where $w_{fund,i}$ – is the weight of the i-th asset in the Fund's portfolio,

$w_{index,i}$ - weight of the i-th asset in the market portfolio,

N – the number of assets in the portfolio.

According to the authors, the combined use of both indicators allows tracking two components of strategic orientation at once: the active share is responsible for displaying activity in terms of selecting assets different from those contained in the market portfolio, and the tracking error as an indicator of the reliability of the investment strategy chosen by the management team. Calculating the active share simultaneously with the tracking error allows researchers to identify not only the binary nature of investment portfolio management (active or passive), but also the type of active management: purely index-based, almost index-based, diversifying, concentrated and factor-oriented. The authors' empirical conclusion is that funds with a high active share have an excess return of 1.51-2.4% per year before commissions and taxes, and a loss of -1.42% to the benchmark for funds with a low active share.

Other measures of the management activity level are: the rate of change of assets within the portfolio; the degree of distinction of the portfolio assets from assets held by similar funds, for example, (Gupta-Mukherjee, 2013); the changes in the risk level of the portfolio (e.g., (Huang et al., 2011)).

The main drawback of this approach is that information about the content of the portfolio at each time is not disclosed by the funds, because otherwise competitors will be able to copy it, which will result in the loss of a significant part of the expected return, as mentioned in the works of (Frank et al., 2014) and (Phillips et al., 2014). In this regard, according to the rules of the US securities and exchange Commission, funds are allowed to disclose quarterly data on the content of the investment portfolio with a lag of 60 days. But even with a two-month lag, only a limited number of statistical databases contain data on the structure of mutual Fund portfolios.

3. EMPIRICAL FINDINGS

In our study we get data from Bloomberg terminal. Our sample was constructed from US funds over 14 years of observations from 2006 to 2019. We include funds which invest mostly in different US sectors. The appropriate sample was created based on the following criteria:

- open-end funds;
- the investment portfolio assets consist of equity securities;
- style (investment goals): Value, Blend, Growth;
- size (market orientation): Large, Mid, Small;
- benchmark - SP500 (we select solely funds whose declared benchmark is the S&P 500);
- country of domicile - USA;
- index funds, highly specialized funds (such as industry funds), and funds that invest a lot in other assets are excluded.

Such dependent variable was chosen for a number of reasons. First, mutual funds are legally required to declare a benchmark, which allows direct use of the officially submitted information. Secondly, both investors and managers compare results with the official benchmark.

Main hypothesis of the study are

- Spread between long-term and short-term rates is a significant factor for the mutual funds “alpha” (the difference between fund and benchmark return).
- Active Funds are better than Passive ones.

Monthly return is the indicator of the fund’s performance which certainly depends on different factors, including micro and macro-variables. Following variables are considered:

- Spread between log return of the tracking error (TOT_RETURN_INDEX_GROSS_DVDS, fund's alpha) and log SP500 return (as the dependent variable);
- Spread between 10-Year Treasury Constant Maturity Rate (rate.10y) and 3-Month Treasury Bill rate (rate.3m);
- is.passive (dummy);
- Style (factor with tree levels Blend, Growth and Value).

Even though we initially select only active funds, some of them are in fact passive. Some of the funds with a high correlation with the benchmark were eliminated. Among the rest, funds with low expense ratio (less than 0.1) and stated fee (less than 0.25) are considered to be passive.

Table 1 contains descriptive statistics for factor Style.

Table 1. Descriptive statistics for factor Style

	<i>N</i>	<i>Blend</i>	<i>Growth</i>	<i>Value</i>
Style	558	267	124	167

We use panel data for fund’s alpha, time series data for SP500 and rates and cross-sectional data for other variables. Time range is from December 2005 until December 2019 (monthly data). It is important to note that the fund’s micro characteristics are almost constant over time. We consider a panel regression under the form (diff is the first difference in time):

$$diff(\log(TOT_RETURN_INDEX_GROSS_DVDS) - \log(SP500))_{it} = \beta_0 + \beta_1 diff(rate.10y - rate.3m)_t + \beta_2 diff(rate.10y - rate.3m)_{t-1} + x'_i \gamma + \mu_i + u_{it}$$

Here $x'_i = (is. passive, Style)$ is the vector of fund’s characteristics. Since regressors in x_i are constant over time, the coefficients γ cannot be estimated for FE-panel regression. Therefore, only pooling and RE regressions are under consideration.

To perform robustness check the models are considered on the following time subperiods:

- Dec2005 - Dec 2008
- Jan 2009 - Dec 2015
- Jan 2016 - Dec 2019
- The whole interval Dec2005 - Dec 2019

Such subperiods were considered roughly in accordance with different periods of US monetary policy.

Diagnostic tests are based on Beta, Sosa-Escudero Yoon robust tests for AR(1) serial correlation and for random effects. The results of tests are presented in Tables 2 and 3.

Table 2. Bera, Sosa-Escudero and Yoon locally robust test: AR(1) errors sub random effects

	<i>chisq.stat</i>	<i>p.value</i>
Dec05-Dec08	367.310	0
Jan09-Dec15	3481.561	0
Jan16-Dec19	2223.721	0
Overall	1329.881	0

Table 3. Bera, Sosa-Escudero and Yoon locally robust test (one-sided): random effects sub AR(1) errors

	<i>z.stat</i>	<i>p.value</i>
Dec05-Dec08	-0.316	0.624
Jan09-Dec15	4.994	0
Jan16-Dec19	4.025	0
Overall	-4.619	1

For all periods we have evidence for serial correlation. For the first two subperiods individual effects are significant. For last period and for overall time range individual effects are insignificant. That’s why in Table 4 following estimation results are represented: Random-effect model for periods Jan 2009 – Dec

2015 and Jan 2016 – Dec2019; Pooling model for Dec2005 – Dec 2008 and for the whole range Dec2005 – Dec2019.

Table 4. Estimation results for Panel models (pooling (PL) models, robust s.e. in parenthesis, *diff* stands for time difference, *lag* stands for time lag)

	<i>Dependent variable:</i>			
	diff(log(TOT_RETURN_INDEX_GROSS_DVDS)) - diff(log(SP500))			
	Dec05-Dec08 (PL)	Jan09-Dec15 (RE)	Jan16-Dec19 (RE)	Overall (PL)
diff(rate.10y - rate.3m)	0.0183***	-0.0405***	-0.0073***	-0.0090***
	(0.0014)	(0.0018)	(0.0019)	(0.0006)
lag(diff(rate.10y - rate.3m))	0.0134***	0.0292***	-0.0149***	0.0201***
	(0.0009)	(0.0006)	(0.0017)	(0.0004)
StyleGrowth	-0.0020**	0.0008**	0.0011***	0.0001
	(0.0009)	(0.0004)	(0.0005)	(0.0003)
StyleValue	-0.0001	-0.0011**	-0.0015***	-0.0009***
	(0.0009)	(0.0005)	(0.0004)	(0.0002)
is.passive	-0.0029***	0.0020**	0.0015***	0.0003
	(0.0010)	(0.0003)	(0.0003)	(0.0003)
Constant	-0.1019***	-0.0070	-0.0010	-0.0106***
	(0.0050)	(0.0044)	(0.0007)	(0.0006)
Observations	19175	41436	18663	81268
R ²	0.0221	0.0425	0.0079	0.0118
Adjusted R ²	0.0219	0.0424	0.0076	0.0117
F Statistic	86.7037***	1840.1210***	148.7652***	194.2064** *
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01			

Empirical conclusion:

- Active funds give significant benefit only on the period Dec2005 – Dec 2008.
- The spread between long term and short-term US government Treasury bonds yield is a significant factor on all periods.
- The lag of the spread is a significant and positive for the overall model and much bigger than the spread coefficient.
- The management style Value is significant on periods Jan 2009 – Dec 2015 and Jan16–Dec19.
- The management style Growth is significant on all the subperiods, but it is insignificant on the whole period.

As for the interpretation we may say that active funds didn't significantly overperform passive funds, but surely, results vary by the periods. Luckily for the active managers the spread between long term and short-term US government Treasury bonds yield is significant factor. This confirms that active professional investors are able to get benefit on the expectation of the market's growth and they should gain more in uncertain period than the passive ones (note the negative and significant coefficient on the first sub-period for the variable *is.passive*).

4. DISCUSSION AND CONCLUSION

What else can we explore here? It would be nice to narrow down the sample and leave only funds that deviate greatly from the benchmark (it isn't clear how to do it properly), perhaps it would have produced stronger results. It is also possible to test whether the performance of second-tier stocks relative to the S&P 500 is a significant factor for alpha-managed funds. In theory, second-tier stocks are more likely to outpace the market when the spread between 10-year and 3-month US Treasuries widens. Since even those funds that position themselves as Large Caps still invest a little in small and mid-cap stocks, the negative dynamics of second-tier stocks, *ceteris paribus*, should have a negative effect on their alpha.

Summarizing, we can say that the shape of the US Treasuries curve (in particular, the spread between 10-year and 3-month bonds) can influence the alpha of actively managed funds. This is an interesting fact in itself, since stock portfolio managers do not always take into account the expected movement of interest rates. As a practical implementation, they can take hedging positions in long US Treasuries to protect their alpha. As for mutual fund shareholders the very understanding that the movement of long US Treasuries will have a significant impact on their fund's results, the investment strategy may not suit them. Despite the fact that active funds don't always overperform passive funds, we can see that the actively managed funds can show better results during market's instability than the passive ones. This makes our inferences relevant for long-term investors given the current situation at the beginning of 2022.

ACKNOWLEDGEMENTS

This research is supported by Russian Science Foundation: grant No. 20-68-47030 "Econometric and probabilistic methods for the analysis of financial markets with complex structure". The author is thankful to Emelyanov Nikita (UK ATON Management) for problem statement and for attention to the work.

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