

MV Research Insights: The Perils of Past Performance

July 24, 2014

Summary Overview

- Past performance is not a reliable indicator of future returns: every SEC-registered investment firm is required to disclose some form of this message in all public advertising media. Yet past returns – most often recent past returns – do play an outsized role in influencing portfolio selection decisions among competing mutual funds and similar assets. Reliance on this one measure of performance can be value-subtracting to portfolios with long term investment goals.
- The influence of past performance on selection decisions is attributable in part to human behavioral economics. Our brains are wired to detect patterns, and to supply narratives explaining those patterns. Investors may interpret a “hot streak” – a pattern of sequential years of outperformance – as indicative of consistent superior ability on the part of a fund manager.
- Another contributing factor to the focus on past performance is the highly competitive nature of the fund industry itself. Mutual fund managers, most of whom seek to outperform a passive market benchmark, compete intensely for assets under management. For a fund to distinguish itself from its peer universe requires communicating some easily understandable metric to the investing public. Annual and quarterly calendar returns are an obvious choice for this metric.
- In this paper we pose the question as to whether there is statistical validity to these hot streaks (and to their converse, an underperformance streak). In other words, we seek empirical evidence either in support of or against the idea that recent past performance is useful as a predictive measure of how the fund may perform in the near to intermediate future.
- For our analysis we used the Morningstar universe of U.S. large cap blend funds, a diverse and liquid universe of professional money managers. We analyzed the peer group of funds with a track record extending back at least to 1990. We employed different ways of measuring recent past performance, and then evaluated the subsequent performance of funds that scored high (or low) based on those past measures.
- In our analysis we found no statistically meaningful evidence to support the predictive power of past performance. A fund that ranked in the top 20% of its peer group for three years in a row, or a fund that ranked first among its peers for the past calendar year, was no more or less likely to perform well in the next one to three years. Conversely, funds ranking at or near the bottom of the universe were no more or less likely to underperform in the near to medium term.
- Prudent investment selection relies on more than a cursory analysis of recent past returns. At MV Financial we obtain a composite picture from a range of quantitative and qualitative metrics to arrive at an evaluation of suitability. Moreover, fund selection itself is only one component of portfolio management. In-depth research, asset allocation, operational execution and ongoing monitoring & repositioning all play key roles in the prudent management of portfolios around the defined goals and risk considerations of each individual client.

II. Tales of Skill and Luck

“Past performance is not a reliable predictor of future returns”. Some variation of this disclosure statement is required for any public communication by an investment firm falling under the regulatory auspices of the Securities and Exchange Commission. Yet the U.S. investment fund industry spends hundreds of millions of dollars annually on messaging based largely on convincing investors that past returns do have predictive power. Investors are treated to glossy ad copy touting a fund’s performance and peer ranking over some time period (often brief), with the required disclosure about the unreliability of past returns tucked away in small print at the bottom. Pay close attention to our great returns, the ads seem to say...oh, by the way, we are required to disclose to you that past returns are actually poor predictors and shouldn’t be overly relied upon.



Best funds based on what criteria?

In this paper we discuss some of the behavioral tendencies and industry practices that perpetuate the reliance on past returns as a key decision factor in fund selection. We then present some of our own analysis in support of the view that the relationship between past and future performance is just what the SEC disclosure says: unreliable. We conclude with a review of the approach we at MV Financial employ when making selection decisions for the portfolios we manage, and a reminder that asset selection is only one component of a multifactor, integrated portfolio management strategy.

a. Pattern Traps and Mean Reversion

The human brain is wired to detect and interpret patterns. It’s how we make sense of an otherwise confusing world. From the standpoint of evolution this skill has served us well, but it can also be the source of behavioral traps and errors in reasoning. We see patterns where they don’t really exist, and those illusory patterns lead us to attribute mistaken causes to the outcomes we observe. Imagine that you are a college basketball fan watching the star of your favorite team at the free throw line in the NCAA Final Four championship. He has made four free throws in a row, and the commentators are all abuzz about this “hot streak”. They – and likely you – feel very confident about his making the next free throw. You are predicting an outcome (a successful free throw) from an assumed cause (hot streak) of the pattern you have detected in the observation of four successful shots in a row. How justified are you in your confidence? As it turns out, not very.

In his book “Thinking Fast and Slow” Nobel laureate Daniel Kahneman, a pioneer in behavioral economics, provides an excellent example of this tendency towards false pattern recognition¹. Kahneman was giving a lecture to an aviation unit in the Israeli Defense Forces about the importance of encouragement and positive feedback in reviewing the performance of pilots in their training exercises. An audience member, a flight instructor whose responsibilities included providing such performance reviews, challenged Kahneman. He noted that his pilots seemed to perform better than average on occasions after they had received a negative, critical review, and that they tended to do worse after receiving praise and positive encouragement.

Kahneman drew on his more than 30 years of analyzing these types of situations to explain why the Israeli flight instructor was right about the observation but wrong about its cause. A highly skilled fighter pilot will, over time, produce a relatively narrow band of outcomes around an average level of performance. On any given day, the outcome of a flight exercise is likely to be somewhere close to the mean. On occasion, though, there will be outliers: a handful of very good and exceedingly poor performances. Sometimes there will even be a string of several outlier performances in a row.

It is precisely those outliers that are more likely than not to motivate the evaluator to offer praise or harsh criticism, particularly if they come in twos or threes. But because they are outliers, they are *less likely* to occur the next time the pilot goes out. In other words, a pilot who has three really bad days is, all else being equal, more likely to do well (relative to those bad days) the next time she goes out. What the flight instructor said is true: the pilots tended to do better after negative feedback and vice versa. The fallacy was *thinking that the feedback itself was the cause of the ensuing performance*. It wasn't: performance simply reverted to the mean.

b. Competition and the Growth Imperative

Professional money managers share some common characteristics with professional fighter pilots or basketball players. They have invested considerable time and effort into acquiring the skills necessary to compete at a high level in a demanding environment with other professional managers possessing similar skills and talents. There are over 29,000 mutual funds listed in the Morningstar U.S. mutual fund database. The majority of these are actively managed funds, meaning that the fund manager's stated primary goal is to outperform a market index, like the S&P 500 or the Russell 2000 small cap index, that serves as a relevant benchmark for the fund's strategy.

The fund manager is thus under constant pressure to demonstrate outperformance, both with regard to the benchmark and with regard to all other funds competing in the same broadly defined investment style. The fund management business is scalable, meaning that as asset volumes grow, profit margins grow accordingly (incremental costs taper off). Growing assets under management means convincing investors – or, to be more precise, convincing the gatekeepers who operate the distribution channels to end investors – that Fund ABC is better than those other 29,000 funds. How to distinguish Fund ABC from the competition thus becomes a matter of high importance.

And here is where the behavioral trap of false pattern detection and the growth imperative of the fund industry meet: the quarterly and annual calendar year total return. The total return – dividends plus price appreciation – is arguably the simplest number by which to convey fund performance. It provides a

¹ *Thinking Fast and Slow* by Daniel Kahneman, Farrar, Straus & Giroux New York 2011, pp175-76.

direct comparison to the benchmark return. Market research firms collect the period returns from all funds in a given investment style and rank them by quintile: top 20%, top 40% etc. The result is that total return, usually over a short period of time like one year or three years, becomes the single most important measure relied upon in making portfolio selection decisions.

Unfortunately, the evidence shows that this measure is also largely irrelevant as a predictor of future outcomes. In the next section of this paper we will present our methodology and findings from an analysis we conducted of mutual funds in the U.S. large cap blend space. We examined the evidence over a full market cycle, from 1990 – 2013, to see whether recent returns performance had any meaningful predictive power for the near to intermediate future.

To say that past returns are largely irrelevant in predicting future performance is not to say that they are not worth evaluating in the context of an investment selection process. Returns over multiple time periods and in different stages of a full market cycle add one element to a comprehensive view of performance. Other measures which contribute to this comprehensive view include: absolute and relative measures of risk, fidelity to a stated investment style, drawdown characteristics, fees and expenses, as well as qualitative considerations about the management team, firm operational processes, regulatory infractions etc. We will return to this discussion in Section IV below.

III. Methodology

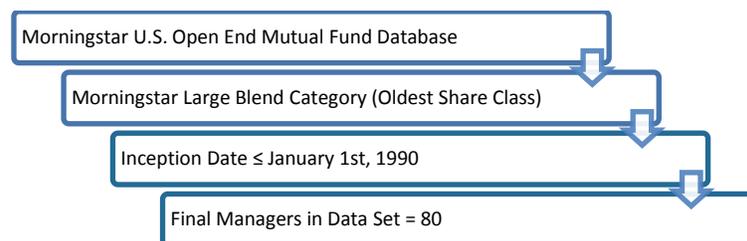
The objective of our analysis is to study the performance of a peer group universe of mutual funds, over a sufficiently long time period, to evaluate whether recent past returns are a useful predictor of near-to-intermediate future performance. Our assumption, which we test via relevant statistical measures, is that **analyzing a given fund’s past 1-3 years of returns performance is not helpful in predicting how that fund will perform in the next 1-3 years**. We focus on the 1-3 year window because of its pervasiveness in the investment industry as a measurement period for asset selection.

The universe for our data set is the Morningstar open-end U.S. mutual fund database. We chose the large cap blend style for the depth and breadth of its constituents, comprising a suitably large percentage of total U.S. equity market capitalization. To eliminate redundant share classes (among funds with more than one class in a single strategy) we included only the oldest share class in each case.

In order to present data over a full market cycle, we further narrowed the selection criteria by choosing only funds with an active, continual performance history dating back to January 1990. This period encompasses over half of the great 1982-2000 growth market as well as the 2000-13 reversal (gap market). It includes three secular bull markets and three secular bear environments.

There may be some selection bias in our final manager data set due to this date range criterion. Any funds that were in existence in 1990 but have since gone out of business will not be included in our analysis. Performance data shown in our analysis may thus be somewhat higher than would have been the case if results for all discontinued funds were included (prior to the year in which they ceased operations). Also, results for funds which changed their prospectus objective (i.e. from large cap blend to something else) at some point during the analysis period will not be included. We believe any such selection bias would not materially impact the integrity of our analysis and conclusions.

Chart 1: Fund Selection Methodology



This produced a final universe of 80 mutual funds. We then ran the annual total return for each year from 1990-2013. We also included the most recent prospectus net expense ratio for each fund, so as to examine the relationship (if any) between fund performance and fees charged.

a. Establishing a Performance Framework

We built out a performance framework by establishing ranking criteria for the funds, applying the following measures to each of the 24 years in our analysis period (1990 – 2013 inclusive):

- Quintile (top 20%, top 40% etc.) based on total period return
- Top-ranked and bottom-ranked fund based on total period return
- Excess return (positive or negative) versus the benchmark

The benchmark index for this study is the Russell 1000 Large Cap U.S. Equity Index (“Russell 1000”).

With this information in hand we then sought to provide empirical evidence for or against the four propositions set out below. In the following subsections of this Section III we explain the methodology employed, and present the evidence borne out by our analysis. In Section IV we put these results in the context of the management of diversified portfolios around defined long term goals.

- Taken as a group, do professionally managed mutual funds add value when compared to the benchmark? Bear in mind that the stated goal of actively managed mutual funds is to outperform whatever index they use as a benchmark.
- Do “hot streaks” have any explanatory value? Specifically, if a given manager has scored in the top 20% of its peer universe for three consecutive years, how likely is that manager to outperform the market for the next one to three years?
- Does the top-ranked fund in any given year do consistently better than the market in the next one to three years?
- Does the converse to b) and c) also apply, i.e. does poor performance (using the same criteria of a three year streak in the bottom 20% and worst-ranked fund in a given year) indicate a higher propensity to underperform in the coming one to three years?

Propositions ii) and iii) are of particular interest to us. The advertising practices of the mutual fund industry focus on recent total return performance more than any other evaluative metric. Financial media outlets and mutual fund research firms do their part by bestowing annual “awards”, top 50 lists and other promotional materials based on the same considerations. The hype permeates into the mind-sets of professional advisors, who use “access to top funds” as a selling proposition to their own clients.

b. Performance Measurement Methodology

i. Total Return and Excess Return

As discussed above, we use annual total return (dividends plus capital appreciation) as the key performance measurement. Comparing the total return of a fund to that of its benchmark provides another useful metric: excess return (“ER”). Excess return is obtained simply by subtracting the benchmark return from the fund return. Positive excess return indicates outperformance by the fund, while negative excess return signifies underperformance.

Taking the average excess return from a time series of data points, and dividing that by the standard deviation of the time series, provides another helpful measure called the information ratio. We can use this to see whether the fund’s excess return is relatively consistent (as indicated by a high information ratio), or not. For example, one fund might generate a small but positive excess return in each of the past five years. A second fund may enjoy one year of extremely high excess return and four years of zero or negative excess return. The second fund may have a higher average excess return for the five year period, but the first fund would likely have a higher information ratio, indicating greater consistency.

ii. Statistical Significance

In asking the question “is a fund’s past performance a useful predictor of its future returns”, we are really asking whether there is any statistical significance in comparing one time series of returns (the fund’s) with another (the benchmark’s). In comparing two time series, we expect there to be some unequal variance, i.e. something other than identical results for each. Statistical methods indicate whether the variance is due to correlated predictive factors (potentially significant) or merely random (i.e. lacking statistical significance).

We use t-tests – specifically, two-sample t-tests assuming unequal variances – as a means of quantifying the statistical significance of each analysis we run. We explain this further when we discuss the results below.

c. *Analysis of Results*

Here we present the results from analysis of the propositions described in Section III(a)(i-iv) above.

i. Overall performance of funds versus benchmark

We calculated the average excess return for each of the 80 funds in our universe. The first row of Chart 2 below shows the average excess return for each year of the study. The second row shows the percentage of funds each year which generated positive excess return.

Chart 2: Average Excess Return, Universe Versus Benchmark (1990-2013)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Excess Return (%) (average for total universe)	0.52	(1.33)	0.61	2.53	(0.89)	(4.87)	(1.18)	(2.53)	(6.64)	(3.84)	9.46	5.25	1.95	(0.81)	0.06	(0.03)	(0.47)	(0.20)	0.21	(0.20)	(2.10)	(1.97)	(2.17)	(2.15)
Positive ER Incidence (as % of total universe)	55.0	52.5	46.3	57.5	41.3	15.0	40.0	35.0	28.8	35.0	71.3	77.5	60.0	28.8	42.5	40.0	45.0	48.8	52.5	46.3	18.8	30.0	23.8	28.8

Source: MVF Research, Morningstar Direct

For the entire period, the average excess return for the fund universe was -0.45%, and the average incidence of positive excess return was 41.7% of the total universe. On average, the peer group did not outperform. What is striking is the wide range of outcomes. In some years there is considerable positive excess return, in other years high negative ER with only a small percentage of funds beating the benchmark. In 16 of the 24 years the average ER was negative, and in 17 out of the 24 years a majority of the funds failed to beat the benchmark.

In other words, investors weighing the merits of actively managed funds for their portfolios should not necessarily expect active funds to outperform their benchmarks. The results here indicate that there is about as good a chance that a fund will outperform as underperform. The standard deviation of the excess return data set shown in Chart 2 above is 3.19, so one could plausibly expect any given fund to be somewhere between 3% and a bit less than -3% versus the benchmark about 68% of the time.

We now turn to the propositions at the crux of our study: whether past performance – either positive or negative – serves as a reliable guide to how a fund may do in the near to intermediate time period.

ii. Analyzing the “hot streak”

Our first cut at analyzing past performance centers on the “hot streak”. We rank the funds by quintiles, identify all funds with a total return performance in the top quintile for a consecutive three year period, and then calculate the fund’s average annual return for the three years following the hot streak. In each case we compare the post-hot streak return with that of the benchmark index for the same period. Chart 3 below presents the data in tabular form.

Chart 3: Performance Analysis of Hot Streak Funds

Streak Years	Fund	Fund 3-Yr Avg. Ann. Rtn., %	Benchmark 3-Yr Avg. Ann. Rtn., %	Fund Excess Return, %	+ve Excess Return Count	t-Test: Two-Sample Assuming Unequal Variances																																	
1991-93	Hartford Capital Appreciation HLS IA-3	17.80	20.20	-2.40	0	<table border="1"> <thead> <tr> <th></th> <th>Variable 1</th> <th>Variable 2</th> </tr> </thead> <tbody> <tr> <td>Mean</td> <td>7.5892118</td> <td>9.639779</td> </tr> <tr> <td>Variance</td> <td>165.80942</td> <td>183.48658</td> </tr> <tr> <td>Observations</td> <td>38</td> <td>38</td> </tr> <tr> <td>Hypothesized Mean</td> <td>0</td> <td></td> </tr> <tr> <td>df</td> <td>74</td> <td></td> </tr> <tr> <td>t Stat</td> <td>-0.6763461</td> <td></td> </tr> <tr> <td>P(T<=t) one-tail</td> <td>0.2504647</td> <td></td> </tr> <tr> <td>t Critical one-tail</td> <td>1.6657069</td> <td></td> </tr> <tr> <td>P(T<=t) two-tail</td> <td>0.5009294</td> <td></td> </tr> <tr> <td>t Critical two-tail</td> <td>1.9925435</td> <td></td> </tr> </tbody> </table>		Variable 1	Variable 2	Mean	7.5892118	9.639779	Variance	165.80942	183.48658	Observations	38	38	Hypothesized Mean	0		df	74		t Stat	-0.6763461		P(T<=t) one-tail	0.2504647		t Critical one-tail	1.6657069		P(T<=t) two-tail	0.5009294		t Critical two-tail	1.9925435	
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1992-94	Hartford Capital Appreciation HLS IA-4	24.42	31.02	-6.60	0																																		
1991-93	Longleaf Partners-3	19.15	20.20	-1.05	0																																		
1992-94	Longleaf Partners-4	25.58	31.02	-5.44	0																																		
1991-93	Oppenheimer Main Street A	14.98	20.20	-5.22	0																																		
1991-93	Fidelity Advisor@ Diversified Stock O-3	19.98	20.20	-0.23	0																																		
1992-94	Fidelity Advisor@ Diversified Stock O-4	28.81	31.02	-2.22	0																																		
1992-94	Mutual Beacon Z	23.37	31.02	-7.65	0																																		
1994-96	Mairs & Power Growth Inv	15.06	26.93	-11.87	0																																		
1994-96	Dreyfus Appreciation Investor	22.89	26.93	-4.04	0																																		
1995-97	ClearBridge Value C-3	22.54	13.38	9.16	1																																		
1996-98	ClearBridge Value C-4	3.43	0.22	3.20	1																																		
1997-99	ClearBridge Value C-5	-11.78	-13.96	2.18	1																																		
1995-97	Selected American Shares S	15.31	13.38	1.92	1																																		
1997-99	Alger Growth & Income I-2	-15.56	-13.96	-1.60	0																																		
1997-99	Putnam Investors A	-22.37	-13.96	-8.41	0																																		
1997-99	Pear Tree Quality Ordinary	-19.71	-13.96	-5.74	0																																		
2000-02	Clipper	8.32	15.85	-7.53	0																																		
2000-02	Franklin Rising Dividends A	12.10	15.85	-3.75	0																																		
2000-02	Longleaf Partners-3	15.19	15.85	-0.67	0																																		
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2001-03	Schwartz Value-3	2.35	11.04	-8.70	0																																		
2002-04	Schwartz Value-4	2.35	9.17	-6.82	0																																		
2002-04	Invesco Equally-Wtd S&P 500 B	7.10	9.17	-2.06	0																																		
2003-05	BlackRock Flexible Equity Investor A-3	-4.93	-5.45	0.52	1																																		
2004-06	BlackRock Flexible Equity Investor A-4	-0.15	-1.13	0.98	1																																		
2003-05	Stratton Mid Cap Value	-6.27	-5.45	-0.81	0																																		
2003-05	Hartford Capital Appreciation HLS IA	-4.05	-5.45	1.40	1																																		
2004-06	Amana Income Investor-3	4.73	-1.13	5.86	1																																		
2005-07	Amana Income Investor-4	4.09	2.31	1.78	1																																		
2006-08	Amana Income Investor-5	12.56	15.34	-2.78	0																																		
2004-06	Eaton Vance Dividend Builder A-3	-0.61	-1.13	0.52	1																																		
2005-07	Eaton Vance Dividend Builder A-4	-5.22	2.31	-7.53	0																																		
2004-06	Prudential Jennison Value B	-0.46	-1.13	0.67	1																																		
2005-07	American Funds Fundamental Invs A	2.57	2.31	0.26	1																																		
2006-08	State Farm Growth	10.07	15.34	-5.27	0																																		
	Average	7.59	9.64	-2.05																																			
	Standard Deviation	12.88	13.55	4.39																																			
	Positive Excess Return Count				14																																		
	Positive ER as % of All Hot Streak Funds				36.8%																																		

Source: MVF Research, Morningstar Direct

If the fund’s hot streak went longer than three years, we measured each three year period for which the streak was in effect. For example, Longleaf Partners had a four year hot streak from 1991-94, meaning that the fund was in the top 20% for each of those years. In Chart 3 we break

this into two hot streaks: the three year period from 1991-93 (“Longleaf Partners-3”), and the three year period from 1992-94 (“Longleaf Partners-4”).

Using this methodology, there were 38 instances of a three year hot streak from 1990 – 2013, involving 23 different funds (out of the total universe of 80). Put another way, about 29% of the funds were able to score a three year streak at least once over this 24 year period. Eight funds managed at least one streak of four years, with two of them extending the good times to five years. No fund had a streak of more than five years. Chart 3 above shows the key results.

Again, the three year average annual return numbers shown here are for the three years following the hot streak, compared to the benchmark for the same period. For this period the average excess return for the hot streak funds was -2.05%, shown in blue near the bottom of the “Fund Excess Return” column, fourth from the left.

We also show the incidence of positive excess returns: in other words, the number of times a fund followed a three year streak with positive excess return for the next three years. This figure is shown at the bottom of the fifth column from the left, titled “+ve Excess Return Count”. Of the 38 hot streaks shown, the ensuing three years resulted in positive excess returns 14 times, or 36.8% of all instances.

Finally, the box in the rightmost column presents the t-test results. T-tests provide a data point for how much statistical relevance a reader should attribute to a time series data comparison. We employ a two-tail t-test (a more stringent variant requiring a higher confidence interval). The two key numbers here are the t statistic (called “t stat” here) and the critical value, here called “t critical two tail”.

If the t statistic is the same sign as the t critical value, and if the t statistic is greater than the critical value, the time series relationship is deemed to have statistical significance. If the t stat is negative and the critical value positive, as is the case here, then significance will be shown if the absolute value of the t stat is greater than the critical value.

In our analysis the t stat is -0.67 and the t critical two value is 1.99. The absolute value of the t stat is 0.67, which is less than the critical value. This tells us that the difference between the average three year returns for the peer group and the benchmark is not statistically meaningful. In other words, there is no statistically relevant reason to believe a fund with three sequential years of performance in the top quintile of its universe will outperform in the next three years.

What about longer time periods? As noted above, there were two funds in our study that enjoyed a five year hot streak. Is a five year streak a better predictive insight? To answer this, let us first state that our sample size here is two, and that in and of itself discounts any statistical relevance. If we do look at the numbers, though, we get a split decision. Clearbridge Value fund outperformed the benchmark by 2.2% in the three years following its five year streak. Amana Income fund, the other five year winner, underperformed by 2.8% in the next three years.

iii. Analyzing the “top dog”

We sought additional evidence that the three year streak analysis is not an anomaly; after all, there are other ways of ranking performance. What about the number one fund? Top-ranked funds get much in the way of media attention and industry accolades, after all. Does choosing last year’s top dog give you a predictable performance advantage in the next three years? We identified the top-ranked fund in our universe for each year from 1990 to 2010 (the last year for which three full subsequent years of data are available). We then ran the same analysis as for the hot streak: comparing the average annual return of the fund for the three years following the number one ranking to the benchmark’s return for the same period.

Chart 4: Performance Analysis of #1-Ranked Funds

#1 Year	Fund	Fund 3-Yr Avg. Ann. Rtn., %	Benchmark 3-Yr Avg. Ann. Rtn., %	Fund Excess Return, %	+ve Excess Return Count	t-Test: Two-Sample Assuming Unequal Variances																																	
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t Stat	0.408																																						
P(T<=t) one-tail	0.3427247																																						
t Critical one-tail	1.683851																																						
P(T<=t) tw o-tail	0.6854494																																						
t Critical tw o-tail	2.0210754																																						
1991	Oppenheimer Main Street A	21.64	6.50	15.14	1																																		
1992	Schwartz Value	10.22	16.11	-5.89	0																																		
1993	Gabelli Value 25 A	10.40	20.20	-9.80	0																																		
1994	Longleaf Partners	25.58	31.02	-5.44	0																																		
1995	Mairs & Power Growth Inv	21.47	27.44	-5.97	0																																		
1996	ClearBridge Value C	37.27	26.93	10.34	1																																		
1997	Gabelli Value 25 A	15.77	13.38	2.38	1																																		
1998	ClearBridge Value C	3.43	0.22	3.20	1																																		
1999	Alger Growth & Income I-2	-15.56	-13.96	-1.60	0																																		
2000	Cipper	8.04	-1.40	9.44	1																																		
2001	Schwartz Value	15.66	6.55	9.11	1																																		
2002	Franklin Rising Dividends A	12.10	15.85	-3.75	0																																		
2003	Neuberger Berman Focus Inv	5.80	11.04	-5.24	0																																		
2004	Eaton Vance Dividend Builder A	23.87	9.17	14.70	1																																		
2005	Eaton Vance Dividend Builder A	4.60	-5.45	10.06	1																																		
2006	Eaton Vance Dividend Builder A	-0.61	-1.13	0.52	1																																		
2007	Natixis CGM Advisor Targeted Equity A	1.32	2.31	-0.99	0																																		
2008	Amana Income Investor	12.56	15.34	-2.78	0																																		
2009	Longleaf Partners	10.52	11.34	-0.82	0																																		
2010	Gabelli Value 25 A	16.74	17.01	-0.27	0																																		
	Average	12.17	10.76	1.41																																			
	Standard Deviation	11.01	11.38	7.27																																			
	Positive Excess Return Count				9																																		
	Positive ER as % of All Hot Streak Funds				42.9%																																		

Source: MVF Research, Morningstar Direct

The results from the top dog study are very similar to those of the hot streak. Here, 9 out the 21 funds in the universe outperform the benchmark in the next three years, or 42.9% of the time. The average excess return for all years is 1.41%, as opposed to the negative average ER for the three year streak funds. But the t test once again leads us to the conclusion that there is no statistical relevance to that variance. The t statistic is 0.41, and the t critical two tail value is 2.02. They are the same sign and the t stat is considerably less than the critical value.

In summary, the three year hot streak universe produced a negative average ER, with funds beating the benchmark less than half the time. The top dog universe produced a positive average ER, with funds beating the benchmark less than half the time. In both cases, no statistically relevant predictive power was shown to exist. Choosing funds based on either past performance metric would likely have no higher probability of outperformance than choosing a fund at random.

iv. Analyzing poorly performing funds

In addressing this last proposition, we consider whether past performance has any explanatory power when the focus is on poor, rather than good, performance. In other words, are funds with strong underperformance likely to continue disappointing their investors? This is an important question, because recent poor performance is a common reason for investment advisors or the investment committees of institutional investors to fire a fund manager.

Since our data set contains only funds with active track records from 1990 to 2013, it will not show results for any funds which ceased doing business as large cap blend managers any time during this period. Probably the most common reason for a fund to go out of business is major capital outflows that make running the fund economically impractical. We believe the existence of any resulting selection bias would not impede the integrity of our analysis and conclusions.

We ran mirror image studies to those described in Section III(c)(ii) and (iii) above. In the first, we analyzed the subsequent three year performance of funds which placed in the bottom 20% for each of the past three years. In the second, we chose the worst-performing fund in each calendar year (from 1990 to 2010) and examined the results for the ensuing three years.

The results were very close to those in the outperformance study, and in both cases the t tests pointed to an absence of statistical relevance. The three year losing streak funds collectively produced an average excess return in the subsequent three years of -2.6%, and the incidence of positive excess return was 23.7% of the time. The t statistic was -0.81 and the critical two tail value was 2.00, again showing lack of explanatory power.

For the bottom performing funds, the average excess return in the next three years was -0.22%, and the incidence of positive ER was 38.1% of the time. The t statistic was -0.07 and the critical two tail value was 2.02. The message here: firing a fund manager for recent underperformance is no more grounded in empirically supported relevance than is hiring a manager on account of recent outperformance.

d. Performance and Fees

Before leaving this section of the paper, we should briefly look at one additional piece of data important to investors: the relationship between performance and fees. In our experience there is a notably wide distribution of fee levels among funds in a given asset class. Here, the expense ratio (i.e. fees as a percentage of assets under management) ranges from 2.1% at the upper end to 0.10% at the lower end. Is there any evidence that higher fees are justified by higher performance?

On average, the answer is no. The correlation between expense ratio and excess return for these 80 funds is -0.05 – basically, zero correlation one way or the other. The average expense ratio is 0.94%. The five funds with the highest overall excess return have an average expense ratio of 0.97%, while that of bottom five funds is 1.30%. This is consistent with other studies that have analyzed the relationship between fees and performance. The conclusion: investment funds are not like consumer goods. You should not expect to enjoy a higher quality of product simply by paying more.

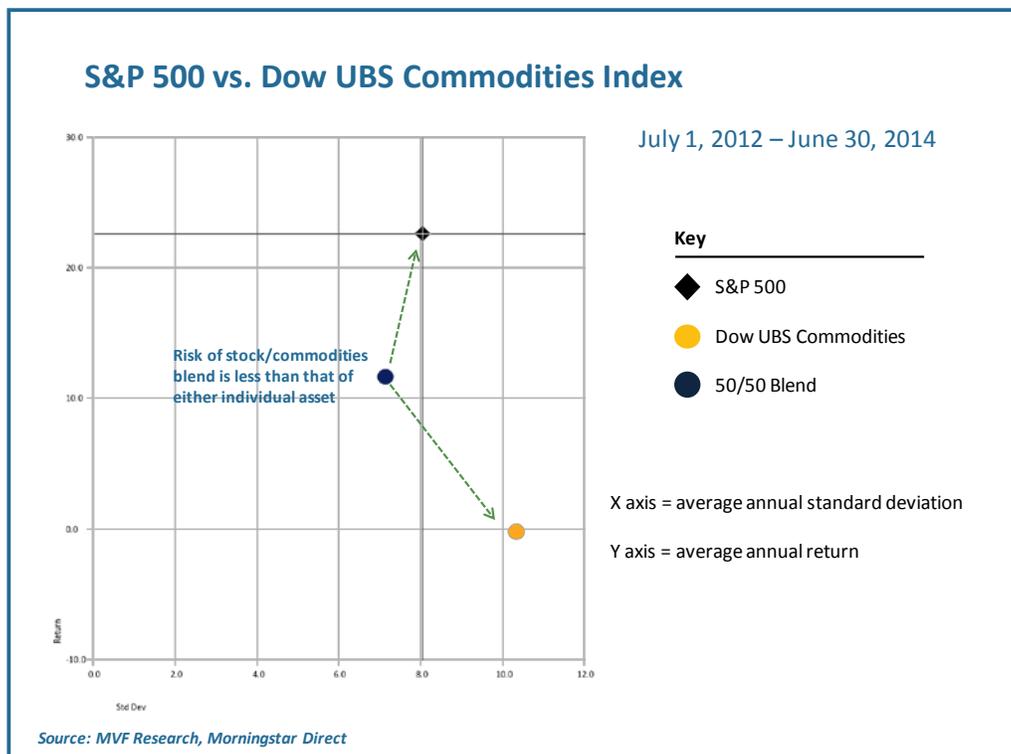
IV. Multifactor Analysis and Integrated Portfolio Management

The reader who has made it to this section of this paper may ask: If recent past performance is such a poor measure of a fund’s future prospects, what is the point of conducting any kind of analysis? Why not just pick funds randomly? Even better, since there is no statistically meaningful relationship between cost and performance, why not simply make low expense ratios the single measure for fund selection? These are valid questions. But we need to consider them in the larger context of all the important factors at work in the management of diversified, long-term portfolios. Analysis of funds and other single assets is indeed an important component of integrated portfolio management. But a multifactor analysis, taking into account a wide range of qualitative and quantitative measures, is in our opinion a more reliable way to position the portfolio for long term success.

a. Asset Performance and Portfolio Performance

When evaluating individual assets in the context of a diversified portfolio, the asset’s individual performance is not the only thing that matters. It also matters how each asset interacts with every other asset in the portfolio. Two assets, assuming they lack perfect positive correlation, are likely to produce risk and return characteristics that vary, sometimes considerably, from a simple average of each individual asset’s results. Consider the chart below, which shows the S&P 500 stock index, the Dow UBS Commodities index, and a 50/50 blend of these two assets.

Chart 5: Stocks & Commodities Blend Characteristics



The most interesting characteristic of the 50/50 stocks & commodities blend is that its risk, as measured by standard deviation, is lower than the individual risk of either the stock index or the commodities index. The explanation for this is that stocks and commodities typically exhibit low correlation to each other. For the two year period shown here the correlation was 0.2 (where 1.0 equals perfect positive correlation and -1.0 would mean the two assets are perfectly negatively correlated).

The importance of integrated portfolio performance is an argument against selecting individual assets either on the basis of one single performance metric like recent past returns, or on a simple cheapest-cost basis. For example, in many institutional and high net worth portfolios there is a substantial asset allocation weight given to large cap domestic equities. This asset class contains a number of distinct styles: deep value, contrarian, high dividend, growth at a reasonable price, and aggressive growth to name a few. Combining several styles into the large cap bucket can produce value for the total portfolio above and beyond the individual performance contribution of each asset.

b. MVF Five Step Investment Approach

Recognizing the importance of integrated portfolio performance, we at MV Financial employ a five step approach to managing our clients’ portfolios. Each step involves a distinct set of skills, experience and operational processes.

Chart 6: MV Financial Investment Approach



Capital markets are dynamic and continually evolving. What worked yesterday may not work today, or tomorrow. *Discovery and research* is the process of constantly analyzing the multitude of factors at play: global macro and micro economic trends, geopolitical developments, asset market price and volatility movements, asset valuation metrics, and variables related to behavioral economics like sentiment and momentum. The understanding gained from our proprietary research methodology gives us a fresh and informed perspective on the critical step of *asset allocation*. A number of studies over time² supply evidence that a portfolio’s performance is more likely to derive primarily from asset allocation choices than by decisions like individual asset selection or market timing.

² For example, see Brinson, Hood & Beebower “Determinants of Portfolio Performance”, *Financial Analysts Journal* July/August 1986 pp. 39-44

Investment selection, the step in our investment approach most relevant to this paper, involves several distinct activities. At MV Financial we evaluate assets across a wide range of quantitative and qualitative performance metrics. The quantitative side includes different measures of return, risk, correlation, style fidelity, drawdown magnitude, duration & frequency, performance in up and down markets, and time-based performance versus relevant peer universes. Qualitative factors we consider include: operational integrity, fees & expenses, management team identity, tenure & processes, length of time from inception to present, and others as deemed relevant from case to case.

An acceptable level of due diligence on each potential addition to our recommended asset list includes, among other things, running proprietary evaluative multi-factor models, reading asset-related literature, and interviewing key members of the fund manager team. Whether a fund's recent return performance is up or down matters considerably less to us than the composite picture that emerges from this multi-factor analysis.

Portfolio management is a catch-all term for the operational discipline of executing a strategy based on asset allocation and selection decisions. This includes investing the portfolio (using a method such as dollar-cost averaging), establishing periodic performance reporting procedures, and monitoring activity on a day to day basis. *Strategic repositioning* involves activities such as annual rebalancing, re-weighting asset allocation exposures when appropriate, and a sell discipline for determining when it is appropriate to get out of a particular exposure.

V. Conclusions

Successful portfolio management around defined long-term investment goals requires a multifactor, disciplined process of research, evaluation, execution and ongoing monitoring. Individual asset selection is an important component of this process. But it is a common practice in the investment industry to base this selection on the misguided assumption that recent past performance is the most important measure in evaluating an asset's fitness for inclusion in a portfolio.

The marketing culture of the modern investment industry encourages this approach by using recent past performance as the key – often only – metric featured in fund advertising and peer group rankings. Unfortunately, this marketing has proven to be very successful. The human brain's tendency to form unsubstantiated conclusions from the detection of patterns lends credence – wrongly – to the idea that if a fund has performed well in the recent past it is likely to do so in the near future.

In this paper the MV Financial research team contributes empirical data to the existing body of evidence pointing to a lack of statistical relevance in the relationship between past and future performance. Whether a fund achieves a number-one ranking based on its last calendar year return, or whether it is on a hot streak of several years in the upper bracket of its peer group, it is generally no more or less likely to continue this streak into the near to intermediate future. The same goes for the converse case of funds that have underperformed their peers recently: they have as much of a chance of outperforming or underperforming in the coming years as any other fund.

Asset selection may be the most visible aspect of the portfolio decision making process, and the one institutional investment committees most often use in evaluating their investment advisors and consultants. Decision makers throughout the industry need to pay more attention to other components of the process as well. The asset allocation strategy – deciding how much weight to accord each asset class among equity, fixed income and alternative categories – has been shown to be a more important factor in long term portfolio performance than either asset selection or market timing. The execution of a portfolio strategy – the operational actions around trading, settlement, ongoing repositioning and client service – are also critical to the portfolio's long term success.

Modern capital markets are complex and continually evolving. Moreover, there are no guarantees that returns available to investors in the next fifty years will resemble those of the past fifty years, or that the strategies which have worked well in the past will work just as well in the future. Disciplined, integrated portfolio management is not a magic bullet – it can't deliver more than the capital markets will supply. But it can put investors in a stronger position to realize their long term goals within the boundaries of appropriate risk constraints.

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