

INVESTMENTS & WEALTH MONITOR

A reprinted article from November/December 2020

How Behavioral Finance Is Delivering Alpha

By C. Thomas Howard, PhD



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A growing trend within the investment industry is the direct application of behavioral finance to portfolio management. This represents a new direction, building on the industry's current emphasis on how investors and advisors can avoid the emotional biases that destroy wealth. Its focus is on using behavioral factors as the basis for constructing an investment strategy, while at the same time avoiding the cognitive errors made by fund managers.

The starting point is the identification of behavioral investment ideas through reading the academic or professional literature, discussions with other investment professionals, or actual experience in managing portfolios. The more ideas the better, because many of them will not pan out.

A critical step is to test each idea using as much objective data as possible. If there is no such data, then the idea should be discarded. Nobel Laureate Daniel Kahneman's admonition to "keep your hands firmly on the data" is particularly important for identifying usable investment concepts (Kahneman 2011). Otherwise, the manager is no better off than the typical investor, who frequently falls prey to cognitive errors.

In this article, I build upon Howard (2019) by exploring the behavioral factors underlying high performance funds. I discuss how to construct a behaviorally based investment strategy and then examine those manager behaviors that both create and destroy alpha. Two important aspects underly high

performance funds: careful creation of a behavioral factor strategy and the avoidance of cognitive errors inherent in managing in the heat of battle.

WHY FOCUS ON BEHAVIORAL FACTORS?

One way to think of professional investing is as a zero-sum game among well-informed investors. If I win, then someone who is as smart and heavily resourced as I am must lose. There is a certain amount of bravado in this way of thinking: I have to outthink and out-analyze my fellow professional investors. This is the professional sports model in which the very best beat their highly competent rivals.

But there is another way to think about investing. As is often said in professional sports, "Take what the defense gives you." Rather than going after the best defender on the other side, pick on the weakest link—which isn't as emotionally satisfying but a successful approach nonetheless. The starting point is the recognition that many diverse groups are driving equity prices. I refer to these as emotional crowds, because new information may provide the trigger but the resulting price is a response to collective emotional decisions.

Markets are awash with excess return opportunities as emotional crowds drive individual stock prices, as well as broad market indexes, away from underlying fundamental value. I refer to these as behavioral price distortions. The challenge is to filter the signals from the considerable underlying noise.

Fundamental analysts accomplish this by conducting careful analysis of a company's financial and competitive situation. Big-data analysts test their ideas on as long and large a database as they can assemble, looking for excess returns that are, ideally, both economically and statistically significant. An investment methodology is then created in order to utilize the resulting measurable and persistent price distortions. Smart beta is an example of this approach in which a methodology is built around one or more of the anomalies. Other active managers may start with this approach but then supplement it with their own management recipes for utilizing the behavioral mispricings.

The focus should be on identifying reliable proxies of behavioral price distortions. Fundamental and objective measures are used to accomplish this, which means that they play second fiddle to behavior in the investment process. This is a sea change in how we typically think about investing, casting fundamental information in a supporting role with behavior as the star.

LIMITS TO ARBITRAGE

Once a strategy is implemented, the challenge is that others also are pursuing the same strategy and will, by trading alongside, reduce or even eliminate the opportunity uncovered in earlier research. Proponents of the efficient market hypothesis contend that such arbitrage-motivated trading means all superior return opportunities eventually are eliminated. However, the evidence provides a much more nuanced picture.

A large body of academic research has uncovered a number of reasons why mis-pricings are not fully eliminated by arbitrage activity. These barriers are referred to as limits to arbitrage (LTA). To date, the LTAs that have been uncovered include higher market sentiment, lower institutional stock ownership, greater idiosyncratic risk, small numbers of stocks available for short sale, low trading liquidity, high transaction costs, smaller stocks, low profitability, non-dividend-paying stocks, and greater financial distress. There is every reason to believe that LTAs will continue to exist.

Another advantage of a behavioral approach is that individual and collective behaviors rarely change. In addition, it helps that the arbitrage conducted in such situations is risky rather than risk free.

The wider the LTA/behavioral moat protecting the opportunity, the more likely the opportunity is to survive. To be successful, the fund manager must not shy away from the LTA/behavioral barriers inherent in the portfolio. That is, where others are unwilling to tread, you rush in to reap returns. In the broadest sense, you continuously hold a contrary view of markets and securities and thus take positions opposite those fleeing such unpopular features.

MARKET EXPOSURE

Being in the right market at the right time offers some of the best returns available to a fund manager. Emotional crowds continually roil markets, so there is a strong incentive to identify measurable and persistent proxies of expected market returns. Many of these are based on measures of under- and overvaluation (one of the best known is Robert Shiller's cyclically adjusted price-to-earnings ratio) or based on technical indicators such as moving averages, momentum, and market breadth.

The empirical evidence for market exposure strategies in general, and these proxies in particular, is at best mixed. Their forecasting ability has been shown

to be ineffective, with large prediction errors. Strategies based on these proxies generally produce unsatisfactory results. The academic literature is particularly brutal with respect to the usefulness of short-term market-timing strategies.

SENTIMENT INDEX

Behavioral measures have fared somewhat better. In 2006, Malcolm Baker and Jeffrey Wurgler proposed a measure based on six objective measures of investor sentiment. Unlike other measures that are surveys of investor and other market participant opinions, Baker and Wurgler's inputs are "put your money where your mouth is" measures. They discovered that when sentiment is high, high LTA stocks are priced at a premium relative to their low LTA brethren, and it's just the opposite when sentiment is low. Of particular interest here is that they also found that when sentiment is low, small stocks outperform large stocks, and when sentiment is high, large stocks outperform small.

The Baker and Wurgler Sentiment Index has been widely accepted within the academic community as a measure of the behavioral state of the market. In this regard, the underlying components provide an objective basis for making exposure decisions with respect to large-cap and small-cap stock markets.

VOLATILITY STRATEGIES

In recent years there has been an increasing interest in market volatility, with the best-known measure being the CBOE Volatility Index (VIX). It is based on the average of implied volatilities from S&P 500 index options on either side of the at-the-money option. There is nothing tangible underlying the VIX calculation, so it is purely a behavioral measure, referred to as the fear index. On the other hand, it is also a "put your money where your mouth is" measure because it is based on actual option prices.

VIX and other volatility measures are widely used for hedging and managing

equity portfolios. The best-known and most successful strategy is referred to as constant volatility, in which equity exposure is inversely adjusted based on changes in volatility.

An array of volatility futures, options, swaps, and exchange-traded products has developed around this most esoteric of concepts. In other words, a purely behavioral trading environment has arisen in recent years. Numerous strategies are built on these instruments, one of which has been successfully implemented by our firm.

MARKET BAROMETERS

For market exposure decisions, our firm uses a market barometer (MB) that measures macro-level crowd behavior. The ranking of 10 equity strategy returns is the input for estimating expected market returns. The resulting MB is used for monthly management of our global tactical portfolio.

Even more intriguing, daily MB, based on the same approach used for calculating monthly MB, performs even better. Table 1 reports the 2016-2020 research results for the ability of daily MB to capture daily SPY (S&P 500 ETF) annualized return.

Table 1
SAME DAY ANNUALIZED SPY RETURNS BY MB

Daily MB Terciles	SPY Return
1	-101.3
2	14.4
3	154.8

Sources: Morningstar and AthenaInvest

Daily MB is excellent at capturing today's market return, as evidenced by the 250-percent annualized return range from the lowest to highest MB tercile. The daily ranking of how investors are rewarding equity strategies captures the underlying drivers of market-wide returns. Note this is not a momentum strategy but rather captures the daily investor behaviors that determine market returns.

Because daily MB estimation is concurrent with the returns reported above, a predictive market returns model is needed. This means that future daily MBs need to be predicted, which, in turn, allows for estimating expected market returns. If such a model is persistent, a successful trading strategy can be implemented.

STOCK SELECTION

I have just discussed a few macro-level behavioral measures that can be used for making market exposure investment decisions. As we drill down into the stock-picking process, a number of behavioral considerations can improve performance. The following four examples show how it is possible to construct individual stock behavioral factor portfolios.

One of the leaders in the application of behavioral factors to stock selection is Fuller & Thaler Asset Management. Richard Thaler has devoted his academic career to the study of behavioral finance and received the 2017 Nobel Memorial Prize in Economic Sciences. His firm's focus is on over- and under-reactions to news events and making investment decisions based on these investor mistakes. The firm marries this with additional fundamental analysis to successfully manage nearly \$3 billion.

Richard Peterson, who developed Thomson Reuters' MarketPsych Indices, led a team that developed the Profiting from Media Outrage strategy. This simple behavioral strategy held the 20 stocks most scorned by social media and the press. Each stock was chosen using objective criteria, held for a year, and featured monthly trading. In defiance of the efficient market hypothesis, the strategy's research results beat the S&P 500 in all but two years from 1999 through early 2018, besting the broad market by an average of more than 10 percent annually. The strategy has since been launched as a public fund.

John Riddle of Jackson Creek Investment Advisors has for 25 years pursued a strategy based on the under- and

overreaction of sell-side analysts and investors to changes in analyst earnings estimates. Using big data, those companies for which such price reactions are most likely are identified. The persistence of this relationship is constantly reevaluated and modified as needed. The behavioral earnings estimate model has produced impressive returns since the mid-90s.

We apply traditional fundamental valuation methods to identify deep value stocks and then overlay behavioral measures of confidence to evaluate a stock's prospects.

AthenaInvest has been employing behavioral factors at the individual security level for picking stocks for its valuation/profitability portfolio since 2002. We apply traditional fundamental valuation methods to identify deep value stocks and then overlay behavioral measures of confidence to evaluate a stock's prospects. Specific behavioral information is gathered from three independent sources: management confidence (paying dividends), analyst confidence (forward price-to-earnings ratio), and creditor confidence (debt ratio). These three are examples of fundamental information playing a secondary role, each proxying for an underlying behavioral error.

FISH WHILE THE FISH ARE BITING

Active equity opportunity (AEO) is a behavioral market measure that indicates when market exposure or stock-picking works best. It reveals how investors, broadly, are driving individual stock return dispersion and skewness and therefore the attractiveness of stock-picking. Active equity managers prefer a higher level of AEO, because it indicates that their high-conviction stock picks are more likely to outperform. In other words, it's a "fish are biting" scenario.

On the other hand, a low AEO foretells a period in which it will be difficult for even the most talented stock pickers to beat their benchmarks. A low AEO indicates a period when market exposure is expected to be more attractive for generating portfolio returns.

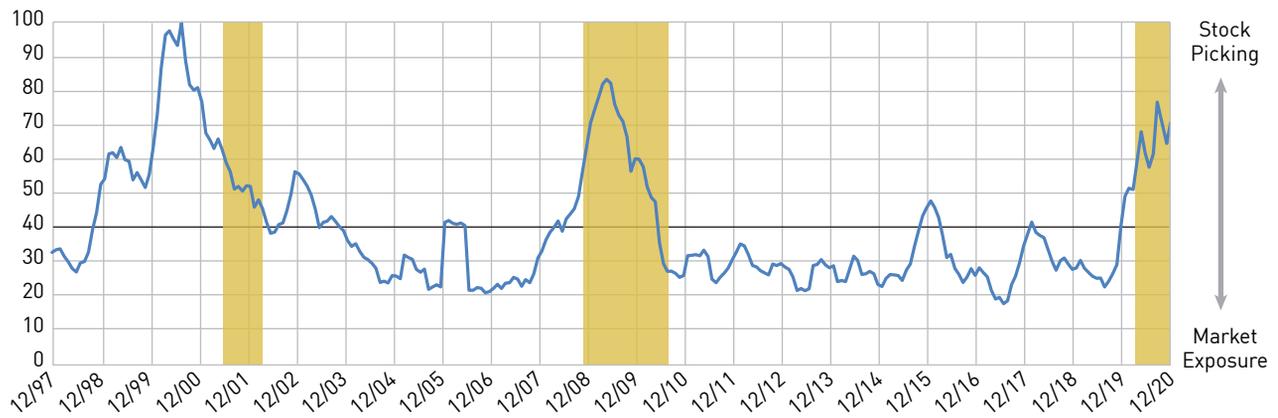
AEO is based on four measures of how favorable or unfavorable the current market environment is for stock-picking (Gorman et al. 2010; Petajisto 2013; von Reibnitz 2017). These measures reveal that returns to stock-picking skill rise in tandem with increased stock-return cross-sectional dispersion and skewness, along with greater market volatility. That is, high levels of cross-sectional and longitudinal volatility are the "fish are biting" scenario preferred by stock pickers.

Monthly AEO for December 1998 through December 2020 is presented in figure 1. The average AEO during this time period is 40, which means values greater than 40 signal a better environment for stock-picking and values lower than 40 signal a worse environment for stock-picking. During this 23-year sample, 1998-2006 and 2008-2010 favored stock-picking. Of particular interest is that between 2010 and 2019, AEO was mostly below average, declining to a low of 18 in mid-2017. This was a period that favored market exposure over stock-picking, and active equity funds generally underperformed during this 10-year period.

In 2020, however, the market has moved strongly in favor of active equity funds, with AEO above 40 and, more recently, above 70. No doubt the pandemic and subsequent economic shutdowns contributed to this turnaround, but other evidence argues for purely emotional causes beyond simply economic dislocations (von Reibnitz 2017). There is evidence that active equity funds have indeed outperformed in recent months. As long as AEO remains above 40, stock-picking will have an advantage over market exposure.

Figure 1

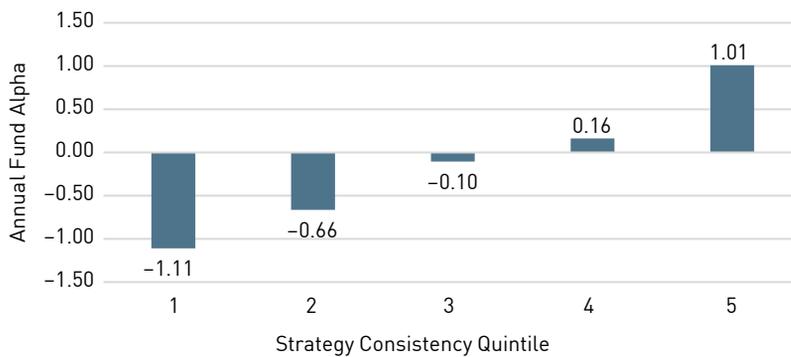
ACTIVE EQUITY OPPORTUNITY, DECEMBER 1997–DECEMBER 2020



AEO is estimated using four components, listed from most to least important: individual stock cross-sectional standard deviation, individual stock cross-sectional skewness, CBOE Volatility Index (VIX), and expected small stock premium. See Howard (2012) for how behavioral market barometers are used to estimate the small stock premium. The gold shaded areas represent NBER recessions. Sources: Morningstar and AthenaInvest

Figure 2

U.S. ACTIVE EQUITY FUND ANNUAL ALPHA BY STRATEGY CONSISTENCY QUINTILE



Strategy consistency is measured as the percentage of own-strategy stocks held by the fund. Sample includes U.S. equity funds during 1997–2017, resulting in 288,000 fund-month observations. Sources: Morningstar and AthenaInvest

MANAGER, HEAL THYSELF

Building a strategy that utilizes behavioral price distortions works only if the manager does not fall prey to the same emotional errors as other investors. It is critical to avoid the cognitive errors that are inherent in managing portfolios in emotionally charged markets. This requires considerable introspection, a rules-based process, and discipline.

STRATEGY CONSISTENCY

An important fund manager behavior is the consistent pursuit of a narrowly defined strategy. The challenge is how

to measure consistency. A common approach is to demand consistent returns over time. All funds outperform at times and underperform at others. This is emotionally difficult for investors, but it is an unavoidable fact when investing in successful active equity funds because strategies do not perform well in all kinds of markets.

Strategy consistency can best be measured by focusing on the type of stocks in which a manager invests. For example, is a value fund invested in value stocks, or is it chasing an unrelated trend such as favoring growth stocks?

Using a top-down process, our firm evaluates consistency by comparing a fund’s holdings to other managers pursuing the same self-declared strategy. The pool of the stocks most held by these strategy managers is referred to as one’s own-strategy stocks. For a manager following a valuation strategy, for example, the pool comprises stocks most held by other valuation funds (Howard 2010).

It makes intuitive sense to use a screen driven by those who are looking for similar stock characteristics. It is worth noting that strategy stock pools are in constant motion because managers make buy and sell decisions based on always-changing economic and market conditions. Unlike the fixed boxes of the style grid, this produces a dynamic process in which stocks of most interest to the manager are changing constantly. That is, the best results are obtained when the investment team moves about the equity universe in pursuit of own-strategy stocks.

Focusing on similar strategy stocks is logically appealing and leads to better fund performance. Active equity funds holding the most similar strategy stocks (quintile 5 in figure 2) outperform those holding the least similar strategy stocks by 212 basis points. This confirms the

advantage of focusing on stocks most held by others following the same strategy. The collective intelligence of active equity fund managers provides valuable information for identifying the most attractive pool of stocks upon which to focus.

ALPHA LIFE CYCLE AND RULES-BASED SELLING

Investment managers can be hardnosed when making buying decisions because they have carefully considered dozens of candidates and invest only in best idea stocks. But once the stock enters the portfolio, there is an emotional transformation. It becomes one of the family. Heaven forbid if it ever goes down. “How could you do this to me!” the manager thinks. “I examined you carefully, even meeting with company management, and this is what you do to me!”

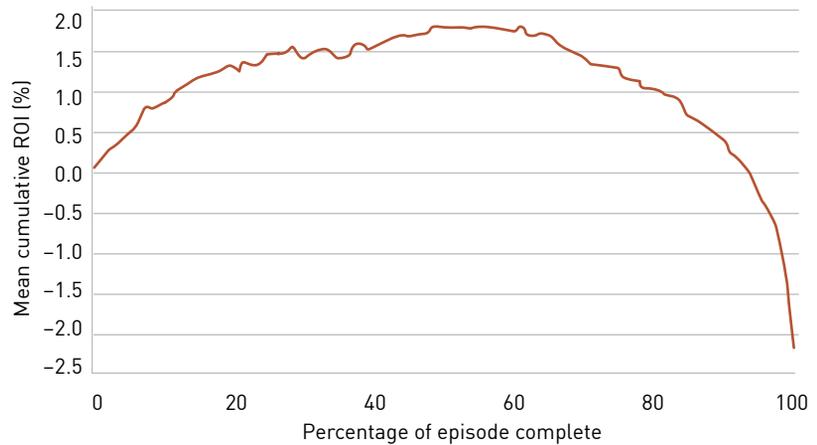
Emotional selling decisions are a problem for professional investors. Woodcock et al. (2019) provides evidence of what many think is the case: managers fall in love with their stocks and end up hurting returns by selling too late. Figure 3 presents the paper’s main results.

The initial upward slope in figure 3 reveals that the typical manager displays stock-picking talent that contributes to increasing alpha up to about 50 percent to 60 percent of the holding period. After that, alpha begins to decline and plummets to negative territory during the final 5 percent of the holding period. That is, on average, managers fall in love with their stocks and hold on to them to the point of extinguishing the hard-earned initial alpha. Managers would significantly benefit by learning to sell a stock before this final destructive stage.

Developing a rules-based selling rule is one of the most important emotional adjustments a manager can make to an investment process. Take the emotions out of selling by developing an objective selling rule, preferably before the stock is even purchased. This reduces the many

Figure
3

GRAND MEAN OF CUMULATIVE RETURN ON INVESTMENT OVER ALL STOCK TIME EPISODES



Note: Based on 10,000 holdings (episodes) for 43 equity portfolios during 2006-2019. Each holding period is standardized to range from 0 to 100 percent of days held. Return on investment is the cumulative net alpha divided by the amount invested in the stock at that time. Reprinted with permission of Essentia Analytics.

cognitive errors surrounding this decision and leads to improved fund performance. The goal is to become as hardnosed about selling as about buying.

Legendary investor Jim Simons of Renaissance Technology learned the importance of rules-based selling early in his career. In horror, he watched as his partner, trading based on emotions and intuition, imploded in the early 1980s. The trading debacle left Simons with deep scars, to the point that he almost gave up on trading to focus on his technology venture capital investments.

But he did not, and he realized that successful investing necessitated a set of specific selling rules lest he get caught up in the powerful emotions generated by market gyrations, like his partner did.

Our scheme is to analyze data and markets to test for statistical significance and consistency over time. After we determine its validity, we ask, “Does this correspond to some aspect of behavior that seems reasonable?” Only in cases of extreme volatility, or if the signals appear to be weakening, does the firm sometimes manually cut back. Otherwise, we don’t override the models.

—Jim Simons (Lux 2020)

Simons’ behavioral data-driven rules-based process propelled him to become one of Wall Street’s most successful investors. The story of how he succeeded where so many others failed is the subject of the book *The Man Who Solved the Market* by Gregory Zuckerman (2019).

CONCLUSION

Investment teams can implant behavioral factors throughout the investment process as a way to improve performance. This can be accomplished by consistently pursuing a narrowly defined behavioral strategy as well as developing an objective selling rule.¹

Building a strategy based on utilizing behavioral factors begins with identifying a number of interesting investment ideas. Many of these will not pan out, so the more the better. A critical step is to test each idea with as much objective data as possible. This data may come from the manager’s experience in conducting fundamental analysis or from a large and long-period data source. If such objective data is unavailable, the idea should be rejected in order to avoid making decisions based on emotional considerations.

Once an idea is confirmed as useful, a trading strategy is created that identifies

the instruments to be employed and the trading frequency. An important part of this methodology is an objective selling rule. We all can be hardnosed when buying, but emotions can be overwhelming when trying to sell.

The front end of behavioral investing involves utilizing the collective emotional mistakes made by market participants. The back end is creating a trading approach that yields strong performance by shielding oneself from the emotional mistakes of others. The results are superior returns for both client and advisor. 🟡

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ENDNOTE

1. For a comprehensive treatment of how to improve your investment process by adding behavioral factors, see Howard and Voss (2019).

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