Research

FIDELITY INSTITUTIONAL INSIGHTS

# Fidelity's Alpha Model for Fund Selection—Taking a Different Path

## A proprietary fund selection tool for more than 17 years for workplace managed accounts and model portfolios


**Bala Balachander, Ph.D**
Team Leader, Quant Research

**Hannah Commoss**
Institutional Portfolio Manager

**Daniel De Ladurantaye Ph.D, CFA**
Portfolio Manager


### KEY TAKEAWAYS

- Fidelity's Alpha Model is an important proprietary fund selection tool within the firm's workplace managed account service, and more recently, some of its model portfolios.
- The Alpha Model is essentially a returns-based regression model that analyzes each fund investment's total return based on its factor exposure to determine its potential to generate peer-beating, risk-adjusted returns on a forward-looking basis.
- Since 2003, the Alpha Model has built on a large body of academic research about the persistence of mutual fund performance, but it deviates on the choice of factors, data frequency, and ranking methodology, based on Fidelity's ongoing proprietary research.
- The Alpha Model is not a traditional momentum model that tends to prefer funds with the highest total returns; instead, it focuses on the repeatability of outperforming fund characteristics that go beyond stylistic and systematic returns.
- The Alpha Model analyzes both active and passive funds at three levels: 1. fund level; 2. peer group level; and 3. given investment universe. Fidelity uses it to select fund investments in U.S. equity, international equity, and fixed income.

Fidelity INVESTMENTS

Fidelity's Alpha Model is an important proprietary fund selection tool and is used by Fidelity® Personalized Planning & Advice at Work,[1] Fidelity's workplace managed account service, as well as some Fidelity model portfolios.[2] First developed in the 1990s, the Alpha Model builds on a considerable body of academic work and has been actively employed since 2003. The Alpha Model also breaks new ground in several ways, including its choice of factors, data frequency, and ranking methodology. This article will outline the key features and benefits of the Alpha Model, why it is not a traditional momentum model, and where it takes a different path based on proprietary and ongoing Fidelity research.

## What is Fidelity's Alpha Model?

The Alpha Model is a proprietary statistical approach that analyzes each fund investment's total return based on its factor exposure to determine its potential to improve risk-adjusted returns over time. The rankings produced by this process are used to select the best investment options for each primary asset class, specifically U.S. equity, international equity and fixed income, that are available in a given investment universe. Of note, the Alpha Model is agnostic on the question of active or passive funds. In instances where an actively managed fund's estimated alpha is smaller than the estimated alpha for a passive fund, this process would naturally assign a higher score to the passive fund. This can result in instances where the Alpha Model may prefer certain passive funds over certain actively managed funds at a particular point in time. The Alpha Model is also agnostic with regard to fund family. As outlined in Exhibit 1, the Alpha Model analyzes a fund at three levels: 1. fund level; 2. peer group level; and 3. given investment universe. (For more on implementation of the Alpha Model, please see "The Fidelity Workplace Advice Methodology—a Due Diligence Guide.")

### Fund level

Research has suggested that the benchmark-relative performance of investment funds, when risk adjusted and isolated from performance due to market factors, has some degree of persistence, particularly when using daily returns. Our goal is to understand when a manager has a process that is durable, essentially to identify manager "skill." As such, as part of the Alpha Model, Fidelity analyzes return data to isolate each fund's systematic returns from what we consider manager "alpha," such as returns from security, industry, or sector selection. Returns are measured in relation to the appropriate asset category's systematic performance drivers, such as market beta and other factors, including market capitalization, region, style, credit, duration, and others, as explored in both academic and proprietary research.

Fidelity seeks to minimize the correlation between factors by employing the difference in returns for common factors such as style (growth/value) and market capitalization (large/small cap). In turn, this increases the stability of the estimated betas. By excluding systematic returns and focusing on each fund's unique drivers of performance, this process is different from traditional momentum-based fund selection, in which funds with the highest returns tend to be preferred. (See page 4 for more on the Alpha Model's differences with momentum models.) The fund selection process also examines returns net of fees to account for the impact of fund expenses. Utilizing net of fees returns creates parity between funds, and enables our process to measure the incremental value generated beyond fees.

**EXHIBIT 1: The Alpha Model analyzes a fund at three different levels—fund, peer group, and given investment universe.**

**1. Fund**
The funds' total return is decomposed, resulting in an alpha expectation for each fund.

**2. Peer Group**
The alpha expectations for each fund are compared at the peer group level, resulting in a ranking for each fund.

Seeks to identify funds with higher alpha potential. Passive funds can be favored when active managers are expected to underperform.

**3. Given Investment Universe**
The funds are then compared to other fund options available in the same primary asset class (U.S. equity, international equity, and fixed income).

Source: Fidelity Investments. Analysis uses alpha forecasts to help identify funds likely to outperform their peers.

## Peer level

At the peer group level, each fund's alpha estimate is then compared to funds within an appropriate peer group. The result is a ranking for each fund. The table below illustrates the list of Morningstar categories that are analyzed to rank alpha within each primary asset class.

| Asset Classes | Morningstar Categories Included | |
|---|---|---|
| U.S. Equity | Large Blend<br>Large Growth<br>Large Value<br>Mid-Cap Blend<br>Mid-Cap Growth | Mid-Cap Value<br>Small Blend<br>Small Growth<br>Small Value |
| International Equity | Foreign Large Blend<br>Foreign Large Growth<br>Foreign Large Value<br>Foreign SMID Blend | Foreign SMID Growth<br>Foreign SMID Value<br>Diversified Emerging Market<br>World Large Stock |
| Fixed Income | Intermediate Term Bond<br>Intermediate Government<br>Short-Term Bond<br>Short Government<br>Long-Term Bond | Long Government<br>Inflation-Protected Bond<br>Corporate Bond<br>Multisector Bond |

### Academic Research on persistence and related themes

Research has identified the value of quantitative methods in manager selection (e.g., Scott Stewart, 2013)[3]. In addition, there is a large body of research about the persistence of mutual fund performance and related themes.

- Jensen, 1968:[4] Jensen's alpha measures the excess return of a classic Capital Asset Pricing Model (CAPM).
- Fama French, 1992:[5] Fama and French expanded on CAPM's market risk factor to develop a three-factor model with two additional factors—size and value.
- Jegadeesh and Titman, 1993:[6] Documented how strategies of buying recent stock winners and selling recent losers generated significantly higher near-term returns than the U.S. market overall from 1965 to 1989.
- Elton, Gruber, and Blake, 1995 and 1996:[7] 1995 research illustrated relative pricing models that explain bond returns; 1996 work focused on the persistence of risk-adjusted mutual fund performance, examining the predictability of stock fund performance using risk-adjusted returns.
- Carhart, 1997:[8] Developed a four-factor model by including a 12-1 returns momentum factor (Jegadeesh and Titman, 1993), and showed the persistence of fund returns over one year goes away after correcting for this returns momentum factor.
- Bollen and Busse, 2001:[9] Explored short-term persistence in mutual fund performance, finding that such persistence exists when using short-term daily returns based regressions of the factors.
- Harlow and Brown, 2006:[10] Researched the ability to identify outperforming active managers among a style-classified sample of U.S. equity mutual funds.

### Investment universe level

Finally, rankings are used to evaluate a fund versus its primary asset class peers. Funds exhibiting a higher alpha score versus others within a given investment universe will be favored in the portfolio construction process, which also takes into account turnover and other risk management constraints.

## How the Alpha Model is different from momentum models

Momentum strategies are more volatile and less persistent than other types of idiosyncratic alpha that the Alpha Model can capture. In addition, momentum is a term that is often misunderstood and variably applied to describe stock or fund phenomena. At the stock level, a traditional 12-1 stock momentum model selects stocks or other securities for purchase that have higher returns over 12 months (skipping the most recent month), and identifies for sale those with lower returns over the same time period, in an effort to generate attractive returns. Fidelity decided to not include a stock momentum factor (as seen in Carhart[11]), based on the firm's proprietary research conducted within its portfolio construction methodology.

Of note, a 12-1 stock momentum tilt, net of the other risk factors, may be picked up by the Alpha Model at a certain point in time, as any number of other sources of return could (e.g., systematic, idiosyncratic or short-term, timing-based factors). To prove that the Alpha Model is not consistently loading on the 12-1 stock momentum factor, Fidelity ran a statistical test; the r-squared of this regression was 5.4%, illustrating that a large part of the signal return variation (94.6%) is unexplained by 12-1 stock momentum.[12]

Fund-level momentum works in a similar way to stock-level momentum. Using raw total fund returns over an evaluation period to pick outperforming funds is susceptible to picking managers who just got lucky (by being in a style that performed well) rather than having true skill, as noted by Elton, Gruber, and Blake, and Bollen and Busse.[13] Fidelity tested how much of the Alpha Model returns are explained by pure fund momentum (by ranking funds with the highest and lowest returns over the last nine months) and found the r-squared of this regression was 32%, again illustrating that a majority of the signal variation (68%) is unexplained by just fund momentum.[14]

Thus, the Alpha Model's risk-adjusted, returns-based signal is sufficiently different (based on these statistical tests) from both a 12-1 stock momentum signal and a pure fund momentum signal. However, it is important to note that the Alpha Model does not remove all momentum, but rather just isolates the part of momentum that is correlated with the factors in said model. What is left is the component(s) of momentum that Fidelity research shows has more persistence.

## Where the Alpha Model has gone in a new direction

The Alpha Model has roots in academic research—particularly the seminal works by Elton, Gruber, and Blake; Carhart; and Bollen and Busse. Over the years, Fidelity has continually monitored and tested the Alpha Model, and this proprietary analysis has resulted in some notable changes to the choice of the factor set, the data frequency used, and ranking methodology for the peer group relative to earlier academic work.

### Factor selection

Some factors can work well alone, but Fidelity research has focused on identifying the right combination. The Alpha Model's set of proprietary factors builds on academic work and years of Fidelity's own research to identify and continually confirm the combination of factors that best captures manager performance durability going forward. These factors have been deliberately selected and researched to give credit to fund managers who are skillful in extracting alpha from lasting sources of returns that can be exploited by Fidelity's portfolio construction process. While the factor selection is proprietary across U.S. equity, international equity, and fixed income, as examples we note the following:

- For U.S. equity, the Alpha Model has used and improved the factor set proposed by Elton, Gruber, and Blake by adding an international factor to explain non idiosyncratic movements of U.S. managers investing outside the United States.

- Within international equity, the Alpha Model has focused on regional factors to better align with a fund's actual positioning, rather than the Fama-French three-factor model of market, style, and size.

### Data frequency

Most academic literature has employed monthly data to estimate the ability of fund managers to add alpha, and early reference research papers used long time periods to allow enough data to reasonably estimate regression models. Fidelity's Alpha model, similar to Bollen and Busse, uses daily frequency data, which enables us to shorten the time period of the rolling window regression to nine months. The collective use of shorter windows and daily data provides the right combination of model relevance (via more recent data) and model significance (via more abundant data).

The general equation for the regression analysis is:

$$r_t^{fund} = \alpha + \sum \beta^f r_t^f + \varepsilon_t$$

Where r represents returns and f represents the specific factors that are used in relation to the asset class of the fund being analyzed. The alpha that is estimated in this analysis is used to rank funds relative to their peers, and this ranking becomes an input to the fund selection process.

Nine months may seem an unusual time period, and Fidelity has been questioned on it over the years. However, continual testing of varying time periods supports nine months as the best window, and the results are consistent across asset classes. More precisely, the optimal estimation window is related to the portfolio reallocation frequency, which in this instance is every three to four months. Given Fidelity's reallocation frequency, the nine-month window is uniquely suited to Fidelity's investment process. If a manager generates alpha over multiple rebalancing periods, which is common in practice, the Alpha Model naturally takes advantage of that by keeping the fund rank high over that horizon. Absent the ability to reallocate with this frequency, the ideal estimation window would have been longer to reflect an extended forecasting horizon.

Bollen and Busse corroborated what the Alpha Model determined in the early 2000s regarding short-medium term persistence by using daily data and shorter estimation windows.[15] Even though Carhart showed persistence of fund returns over one year goes away after correcting for momentum, Bollen and Busse (and Fidelity's own internal research) shows that shorter-term persistence exists. This can be predicted using daily returns-based regressions of the factors.

While the Alpha Model's primary data source for mutual funds is Morningstar, in the limited cases where fund-level information is insufficient, Fidelity may employ qualitative sources. For example, for newly created funds that lack a long track record, information in the fund's prospectus can be used to develop return proxies and estimated factor exposures. The portfolio construction process also draws upon the fundamental manager research within Strategic Advisers, when it is helpful in supplementing insufficient data.

### Ranking methodology

Peer group definitions vary across asset classes. Early work on mutual funds tend to group together all funds within an asset class. However, Fidelity's research (also see Harlow and Brown) has shown that classifying mutual funds by peer group can be a better way to compare funds. Fidelity has customized this process, and depending on the asset class, chooses to use coarser/finer grained classifications. For example, within U.S. Equity, peer groups are based in individual Morningstar categories (such as Large Growth), whereas in Fixed Income, multiple categories are combined.

## Performance analysis illustrating the Alpha Model's efficacy

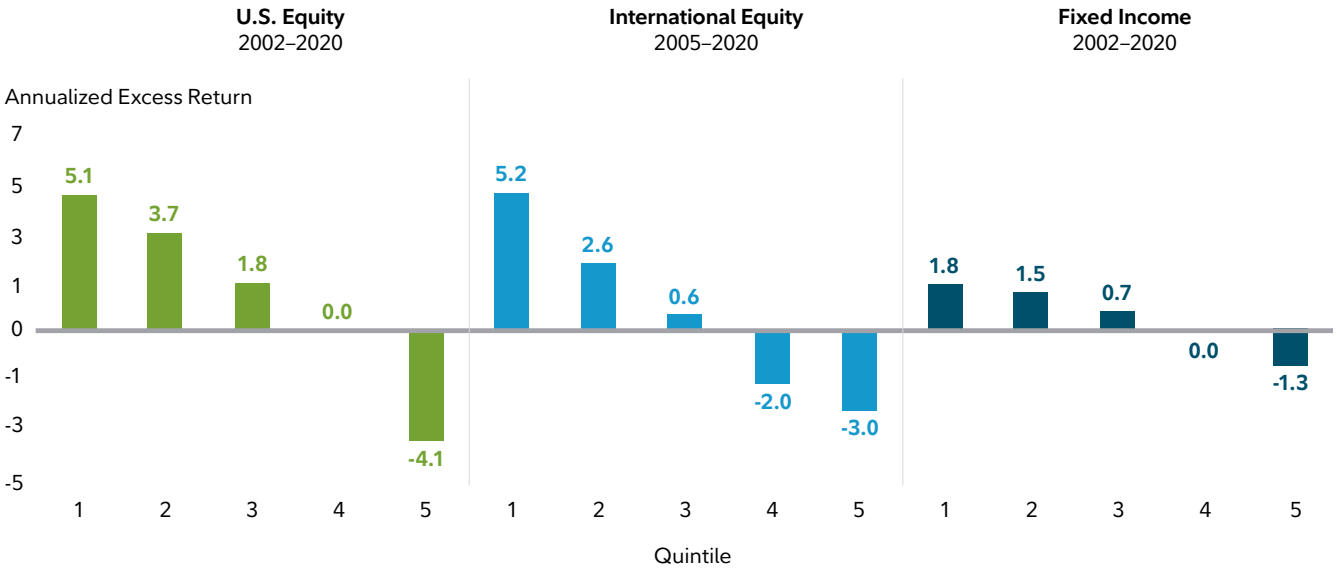
Rigorous and continuous testing has been critical to the Alpha Model's efficacy over the years. Fidelity has built a robust back-test infrastructure to improve and evolve the Alpha Model and avoid data overfitting.[16] Fidelity tests the Alpha Model within asset classes and peer groups to make relevant comparisons and eliminate potentially spurious results from comparing vastly different funds. Fidelity also performs full portfolio construction back-tests to verify the Alpha Model's performance translates into better portfolios for a variety of fund universes.

Fidelity leverages in-house capabilities to run backtests for thousands of different fund universes. The firm has also tested numerous other scenarios such as longer regression lookback periods and forecasting periods of varying lengths to ensure the robustness of the results.

As outlined in Exhibit 2, the Alpha Model has been able to successfully identify high-performance funds, based on a review of more than 20,000 funds from January 2002 to December 2020 for U.S. equities and U.S. bonds, and from January 2005 to December 2020 for international equities (due to data availability). The excess return was calculated by subtracting the Morningstar peer style box performance from the average performance of the funds in each quintile. The asset class category performance by quintile was weighted based on the number of funds in each Morningstar category, and quarterly performance was compounded and then annualized.

**EXHIBIT 2: The Alpha Model has been able to successfully identify high performance funds, based on a review of over 20,000 funds since the early 2000s.**

Fund Excess Return by Alpha Rank Quintile (January 2002—December 2020)




Source: Fidelity Investments, as of December 2020. Excess return by alpha rank was based on a universe of 20,000+ funds over a period of January 2002 through December 2020 for U.S. equity and fixed income and January 2005 through December 2020 for foreign equity due to data availability. Funds in each asset class were ranked into quintiles using Strategic Advisers' proprietary alpha models. Strategic Advisers' current alpha models were used to rank U.S. equity and fixed income funds. For periods prior to September 2015, the preceding international equity alpha model was applied and for periods since September 2015, the current international equity alpha model was used to rank the funds. This was done to more closely mimic what was used in the live product. Excess return was calculated quarterly by subtracting the Morningstar peer style box performance from the average performance of the funds in each quintile. The asset class category performance by quintile was weighted based on the number of funds in each Morningstar style box. The quarterly performance was compounded and then annualized.

## Conclusion

Alpha can be illusive in highly efficient and liquid markets, often arbitraged away once discovered, but Fidelity's Alpha Model, employed for over 17 years, has been able to successfully identify high-performing funds. With underpinnings in academic research, the Alpha Model has been validated and refined over time through Fidelity's proprietary research. As a dynamic fund selection methodology, the Alpha Model helps Fidelity build robust portfolios for plan sponsors and financial advisors by identifying funds, be it active or passive, that have the potential to outperform their peers.

## Authors


**Bala Balachander, Ph.D**

Team Leader, Quant Research

Bala Balachander is a team leader in the Quantitative Research Group at Strategic Advisers LLC, a registered investment adviser and a Fidelity Investments company. In this role, Mr. Balachander is responsible for conducting and managing quantitative research in asset allocation, multi asset class portfolio construction, and investment methodology in a fund of fund managed account business.

**Hannah Commoss**

Institutional Portfolio Manager

Hannah Commoss is an institutional portfolio manager at Strategic Advisers LLC, a registered investment adviser and a Fidelity Investments company. In this role, Ms. Commoss is responsible for delivering Strategic Advisers' managed account investment philosophy, process, and strategies to a wide range of investors.

**Daniel de Ladurantaye, Ph.D, CFA**

Portfolio Manager

Daniel De Ladurantaye is a portfolio manager at Strategic Advisers LLC, a registered investment adviser and a Fidelity Investments company. In this role, Mr. De Ladurantaye is responsible for directing and overseeing the portfolio management activities of Workplace Managed Accounts, as well as the non-discretionary model portfolios for Fidelity's retail and workplace clients.



*Fidelity Thought Leadership Vice President Martine Costello provided editorial direction for this article.*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[2] Fidelity Target Allocation Model Portfolios, and Fidelity PP&A-W employ the Alpha Model; however, the peer group definition used by Fidelity Bond Model Portfolios is different.

[3] Scott Stewart, "Manager Selection," 2013, CFA Institute.

[4] Michael C. Jensen, "The Importance of Mutual Funds in the Period 1945–1964," *The Journal of Finance*, May 1968.

[5] Fama, E. F., & French, K. R. (1992). The Cross-Section of Expected Stock Returns. *The Journal of Finance*, 47, 427-465.

[6] Narasimhan Jegadeesh; Sheridan Titman. *The Journal of Finance*, Vol. 48, No. 1. (Mar., 1993), pp. 65-91.

[7] Edwin J. Elton, Martin J. Gruber, and Christopher R. Blake, "Fundamental Economic Variables, Expected Returns, and Bond Fund Performance," *The Journal of Finance*, 1995, vol. 50, issue 4, pages 1229-56; "The Persistence of Risk-Adjusted Mutual Fund Performance," *Journal of Business*, Vol. 69, No. 2, (April 1996), pp. 133–57.

[8] Carhart, M.M , "On Persistence in Mutual Fund Performance," The *Journal of Finance*, 1997, Vol. 52, Issue 1, pp. 57-82.

[9] Nicolas P. B. Bollen and Jeffrey A. Busse, "On the timing ability of mutual fund managers, *Journal of Finance*, Vol. 56, No. 3, (June 2001), pp. 1075–1094.

[10] W. V. Harlow and K. C. Brown, "The Right Answer to the wrong question: Identifying superior active portfolio management," *Journal of Investment Management*, Vol. 4, No. 4, (2006), pp. 1–26 (2006).

[11] Op. Cit. See footnote 8, Carhart.

[12] Fidelity Investments. The test regressed the spread returns (Q1–Q5 return series) based on the U.S. equity model from January 2003 to August 2019 against the same period 12–1 U.S. stock momentum monthly factor returns from Ken French's website. https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[13] Op. Cit. See footnotes 7 and 9. Elton, Gruber and Blake, and Bollen and Busse.

[14] Fidelity Investments. The test regressed the returns (Q1–Q5 return series) based on the U.S. equity model from January 2003 through August 2019 against the returns (Q1–Q5 return series) based on ranking funds simply by their total returns over the same period.

[15] Op. Cit. See Footnote 9, Bollen and Busse.

[16] Overfitting happens when estimated models perform well (almost too well) in sample but then perform poorly out of sample. This happens because models end up tracking the noise in the sample data than capturing true statistical relationships.




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