Hedge Fund Alpha and their Best Ideas

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Epsilon Asset Management
The Intersection of Active and Passive®

Introduction

Countless industry conferences and dinners are devoted to "Hedge Fund Best Ideas," while fund managers are popularly lionized as stock picking gurus.

Epsilon Asset Management has partnered with New York University to produce a comprehensive quantitative study that examines the stockpicking behavior of nearly 1,500 hedge funds from 1999 to 2018 to quantify the skill of these vaunted managers, and to see whether their *Best Ideas* truly outperform the market and deserve the attention they receive.

Below we explore some of the key findings of the report, but the key message here for investors is that if you are pitched a "Best Idea" by a hedge fund, you need to see the evidence and substantiation of outperformance for yourself.

Looking at two distinct periods of recent history, our study also uncovered two further warnings for investors:

- The size and growth of the hedge fund industry has had a deleterious effect on alpha generation
- The nature of the macro-environment (put crudely: bull or bear) has important implications for hedge funds' ability to generate alpha

Perhaps more than anything else, our study is a clarion call to investors about the importance of understanding a hedge fund's portfolio construction, and how the fund is assessing the risk and sizing the investment decisions.

A final note: In light of recent volatility in the markets as a result of the COVID-19 pandemic, below you will also find a short postscript that takes a look at hedge fund performance since the conclusion date of our study in 2018.

We hope you find this report insightful and informative. You can find the full academic paper here, and please feel free to contact us directly with any questions you may have.

What We Found

- We present new evidence of true stock picking skill across hedge fund managers
- Through our unique data capture, we are able to disaggregate hedge fund long-equity portfolios for the purpose of teasing out Best Ideas
- Our analysis points to no systematic outperformance of these Best Ideas versus other portfolio positions held by hedge fund managers, across all size funds, and over all time periods
- The fact that hedge fund Best Ideas don't outperform the rest of their portfolio positions may have a silver lining: the incentive fee portion of the hedge fund manager's compensation dissuades the manager from seeking wealth solely through asset accumulation, so their portfolio positions all have merit (not just the 'Best Ideas')
- Our data avoids some of the biases associated with traditional returns database analyses (survivorship bias, inclusion bias, incubation bias)

This study is an exploration of investment management skill. It tackles the thorny question of skill across hedge fund managers and at a time when stock picking ability is an increasingly important differentiator given the unprecedented growth of passive management, the rise of ETFs, and the opportunity afforded by spasms of market volatility. While hedge funds draw media attention due to their secrecy, remuneration, and colorful character, their less regulated nature has made it more challenging to answer some fundamental truths – until now. In the following pages you will see a deep and multifaceted look at one essential question: **do hedge fund managers possess skill?**

The first part of our study finds that the alpha generated through long-equity stock picks by hedge funds is meaningful over a twenty-year period. Unfortunately, for present-day investors, that value has diminished over time. This may be a function of the overall market environment, or it may be a function of the increase in relative size of the hedge fund industry.

Debunking the mythology surrounding hedge fund 'Best Ideas'

The second part of our study explores the dynamic between the performance of hedge fund Best Ideas and their relation to the rest of the portfolio positions. ***Ostensibly the holy grails of their holdings, in reality they demonstrate little performative difference from the rest of their portfolios. This is something you may want to keep in mind the next time you attend an idea conference!***

As you will see in these pages, our evidence broadly suggests that hedge fund Best Ideas do not outperform the rest of their portfolios, contrary to both popular belief and comparable studies on mutual funds.

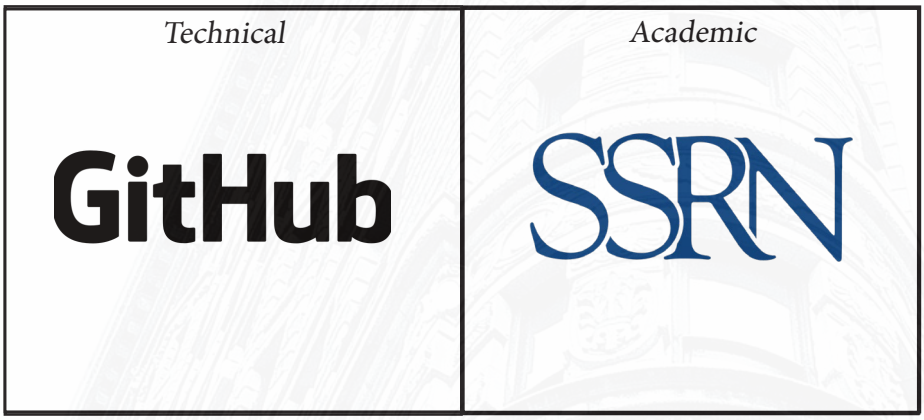
What We Found (cont'd)

If there is a silver lining to this, it is that the lack of difference between "Best Ideas" and "Rest Ideas" may be a function of the unique incentive of hedge fund managers: **the incentive not to merely stick close to the indexes**. In other words, they have every reason to make sure that all of their holdings outperform market benchmarks.

Prior studies have theorized that mutual funds tend to asset gather, which leads to filling the portfolio with generic, index-based market exposure. Conversely, the incentive fee portion of a hedge fund manager's remuneration seems to dissuade these firms from asset gathering, and it can be seen through the way they construct their portfolios.

The whitepaper you are reading just scratches the surface of our broader findings. For the full story, visit our GitHub site, where we have dozens of pages with additional results and deep analysis of what our study uncovered. You will find time series charts, factor data and regression coefficients, as well as detailed measurements of statistical significance.

If digging into the code is not your cup of tea but you still want chapter-and-verse on our results, please see our full academic paper, which provides more underlying data and the economic theory behind the findings summarized here.



Executive Summary

Hedge Funds and Stock Picking to find Alpha

- In the past 20 years, hedge funds have generated 250 basis points (2.5%) of annualized alpha (risk-adjusted excess return over the domestic market indexes) across their long domestic stock picks (gross of fees).
- Generally speaking, smaller firms have generated more alpha over the period than have larger firms.

A Tale of Two Periods

- Splitting our 20-year sample into two 10-year periods, we find the alpha was demonstrably greater in the first period (July 1999 to June 2009).
- Over time, alpha has decayed in tandem with the rise of hedge fund assets.

Hedge Fund Best Ideas: Position Level Analysis

- "Best" vs. "Rest": We identified hedge fund *Best Ideas*, testing whether they outperformed the rest of their portfolio positions.
- In contrast to prior studies on mutual funds, *we found little evidence towards Best Idea outperformance.*

Why This Matters: The Findings Suggest That…

- The incentive fee of a hedge fund manager's compensation protects investors from the endemic asset gathering found at mutual funds, where compensation is driven by total assets alone.
- The focus on hedge fund stock picks at idea conferences and events is misguided and possibly counterproductive.
- Active management still produces real value, specifically when overseen by incentive-fee managers.

Hedge Funds and Stock Picking to find Alpha

- Our study finds that hedge fund managers as a whole have been able to generate statistically significant alpha through their long stock portfolios
- Over the last 20 years, hedge fund long domestic equity stock picks have generated approximately 250 basis points (2.5%) of annualized alpha when controlling for the size of the firm
- That alpha slips to 150 basis points (1.5%) per year when we asset-weight our analysis, indicating the relative outperformance of smaller funds
- Our analysis was conducted by looking at the Form 13F SEC filings[1] of more than 1,500 hedge funds with assets ranging from $100 million to $100 billion+. This regulatory capture method is a means of controlling for common biases associated with returns databases

From the early 1990s through the middle of the last decade, hedge funds were the central growth story in active management. In the last five years, however, that story has abruptly changed, with equity long/short managers bearing the brunt of investor ire as they wondered where the returns had gone. Our analysis of hedge fund stock picking helps provide answers.

The first order of business is to quantify precisely how stock picking and alpha generation have fared. Ordinarily, this is not a simple or straightforward question to answer, given the opaque nature of hedge fund disclosure. But by tapping into regulatory-mandated transparency through SEC Form 13F, we can gain unique insight into this investor class and begin to peel back the layers.

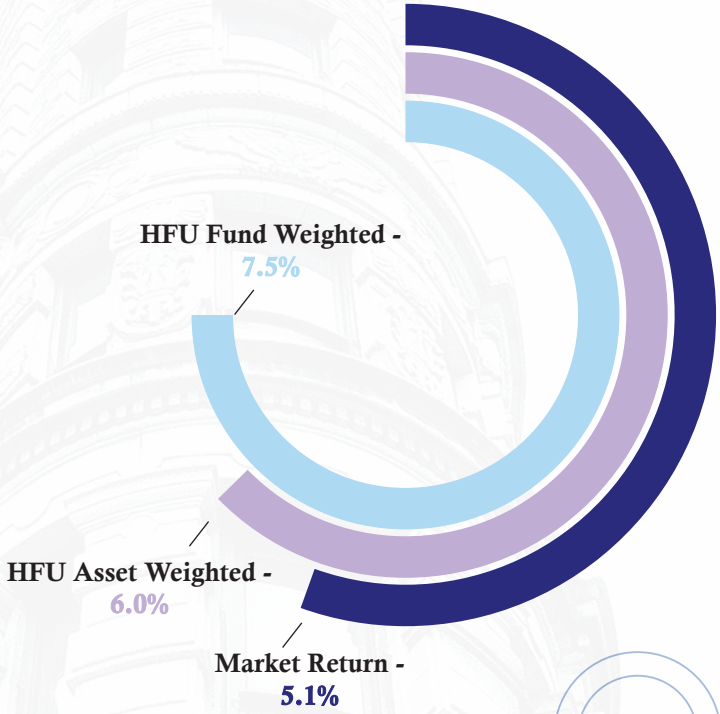
Our Analysis covers 1,489 unique hedge fund firms across 20 years of regulatory filings. The peak assets filed across these firms is in excess of $2.5 trillion (Sep 2018)

We source this data from Novus Partners, Inc., a partner with a specialization in 13F data. By systematically capturing this data through standardized filings made over the course of 20 years, we controlled for the common biases typically associated with hedge fund return databases:

Epsilon Hedge Fund Universe ("HFU") Comparison
Annualized Alphas (Jul 1999 - 2018)

	Fama French (2015)	Q Factor (2014)	Carhart (1998)
HFU - Fund Weighted	2.4%	2.6%	2.4%
HFU - Asset Weighted	1.6%	1.6%	1.1%

Annualized Return:
Market vs Aggregate HF Composites



Source: Epsilon, S&P Global. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

1 - See page 16 for information regarding data sourcing.

1. **Survivorship bias**: our analysis includes hundreds of funds that went out of business or "blew up"
2. **Selection bias**: our analysis includes hundreds of funds that otherwise would not report their returns to databases
3. **Incubation bias**: our analysis captures the performance of all firms that file 13Fs, which begin once reaching $100 million in eligible assets

So what are the results? Most importantly we found that hedge fund managers as a whole have been able to generate statistically significant alpha through their long stock portfolios, measured against three separate factor models.

Whether or not investors receive this alpha is a separate debate. Our measurements are "gross of management or incentive fees," meaning those costs are not factored into the returns an investor would ultimately see. For the purpose of this study, we wanted to focus solely on the stock-picking skill of hedge fund managers and not the value received by investors.

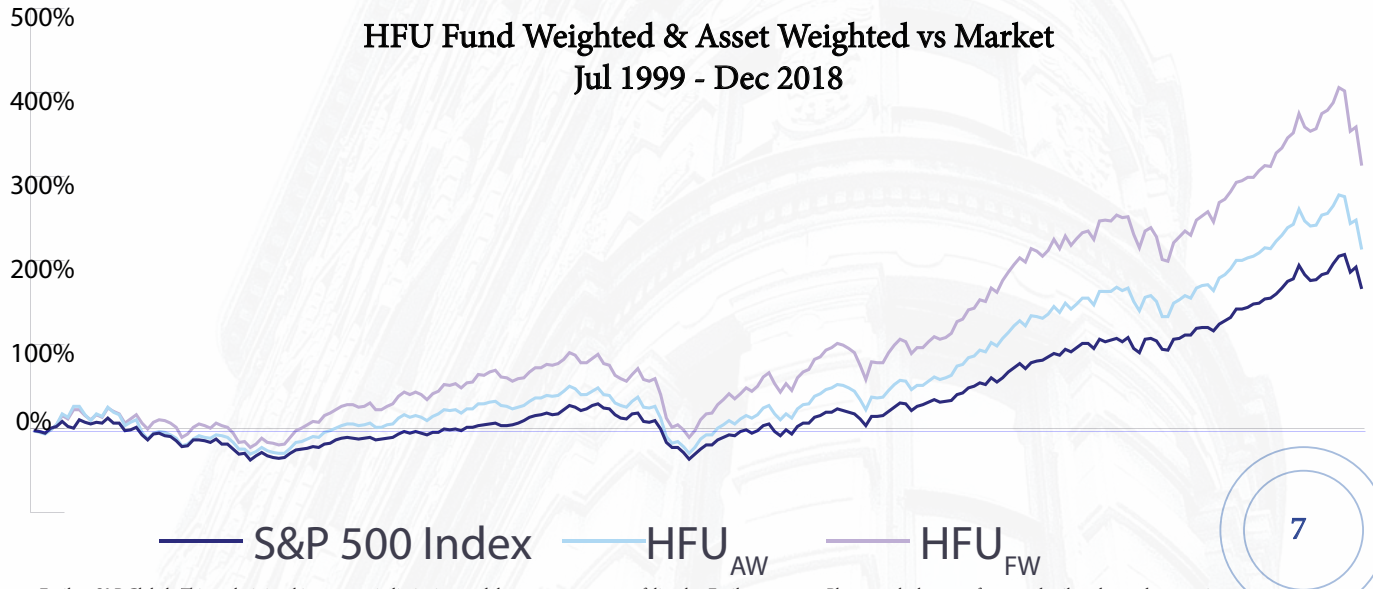
We find annualized alpha of approximately 1.1% to 1.6% per year when not adjusting for fund manager size. We call this the "asset weighted" composite of all hedge funds (HFU_{AW}). In this composite, firms with greater reported assets are weighted more heavily than firms with less in assets.

When you treat each manager equally, regardless of their portfolio's market value, hedge fund alpha is closer to 2.5%. We call this the "fund weighted" composite of all hedge funds (HFU_{FW}). This finding points to a relative underperformance in larger funds.

To further confirm this size-related finding, we split our universe of funds into two dynamic halves: larger funds and smaller funds. We measured the performance and alpha generated by each of the two populations. Our set of smaller funds generated over 60bps of excess annual performance versus our larger set. The alpha as measured across our three models varied dramatically, due to the difference in factor tilts between the two sets.

Notably, these findings are in contrast to comparable mutual fund studies, which have found average alpha for an entire population of funds closer to zero over multi-decade periods. These studies include seminal works by academics Bill Sharpe in the late 1960s, Mark Carhart in the late 1990s, as well as Eugene Fama and Ken French in 2010.

It's important to note that while this is encouraging for hedge fund investors, our analysis was conducted using only the data captured by Form 13F, meaning that exposure through long leverage, a short portfolio, or alternative level two and level three assets such as derivatives, is not taken into account.



Source: Epsilon, S&P Global. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

A Tale of Two Periods

- We split our 20-year analysis into two 10-year periods, with the financial crisis of 2008 falling approximately in the middle
- The first period (July 1999 to June 2009) demonstrates statistically superior alpha generation as compared to the second (July 2009 to December 2018)
- The deterioration of alpha in the second period coincides with the increased asset footprint of hedge fund firms as well as a significantly different macroeconomic environment

Establishing the presence of alpha generation across hedge fund portfolios, a logical follow-on is unpacking how that alpha has changed and whether or not it is sensitive to the prevailing investment environment and wider economic conditions. Resisting a more complex scheme, we simply split our analysis into two separate time periods. Owing to the very different nature of the two moments in question, this was sufficient to tease out meaningful insights on how stock picking alpha has evolved over time.

Our initial analysis covered 20 years of data and nearly 1,500 fund managers. To better understand the change in alpha over time, we split the time series into two comparable 10-year periods, centered around the financial crisis. The more alpha-rich Period 1 (Jul 1999 - Jun 2009) was a dramatically different market environment from Period 2 (Jul 2009 - Dec 2018), as the former saw the US weather two bear markets.

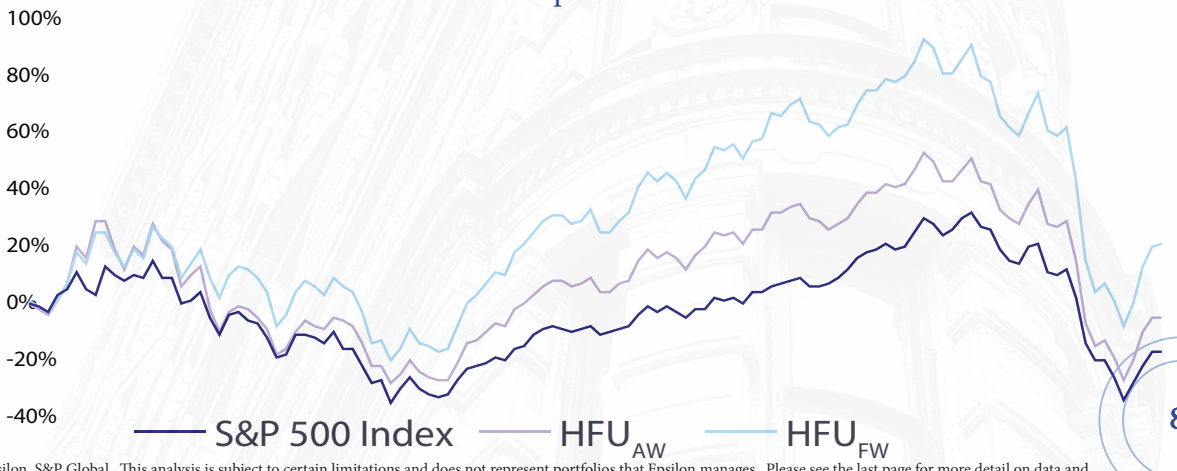
Meanwhile, the footprint of the hedge fund industry was much smaller (our set of managers averaged $700 billion in assets for Period 1 versus $2 trillion of aggregate reported assets versus in Period 2). **Fund managers did quite well in Period 1, both in absolute and relative terms.**

Measured against our three factor models, fund managers generated approximately 350-400 basis points (3.5% - 4%) of alpha per year. This alpha came in a period where the market generated a negative absolute return; faced with no economic return from passive investing, hedge fund investors were getting prime value from their hedge funds' stock picks.

A Tale of "Two Periods"

	Market Return (ann.)	Sharpe of Market	Avg Reported Assets (HFs)
Period 1 (Jul 1999 - Jun 2009)	-2.2%	-0.26	$700 bn
Period 2 (Jul 2009 - Dec 2018)	**13.5%**	1.04	$1,800 bn

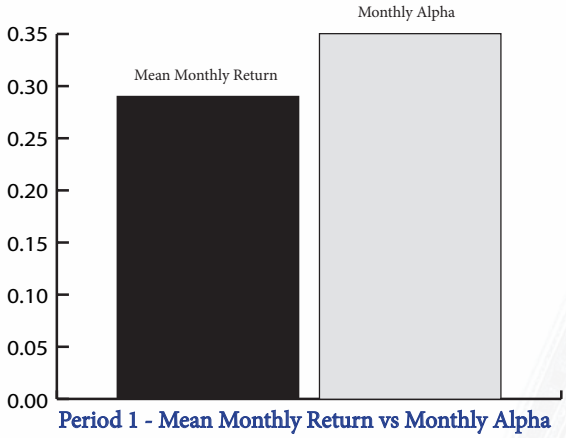
Performance of our HFU Composites vs the S&P 500 - **Period 1**



Source: Epsilon, S&P Global. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

Period 2 was more challenging both on a relative and absolute basis, with alpha generation.

When we move to Period 2 we see a different story; this period can be described as an unbridled bull market, as evinced by the high Sharpe ratio of the market (a widely-recognized measure of the return of an investment compared to its risk). As referenced above, during these ten years, hedge funds had a much larger footprint, even after shedding assets in the aftermath of the financial crisis.



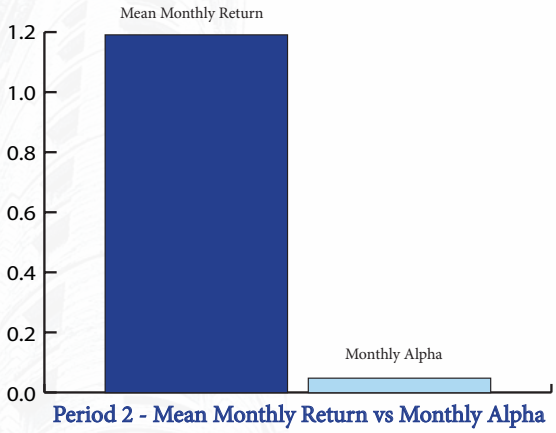
Period 1 - Mean Monthly Return vs Monthly Alpha

Source: Epsilon. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

Period 2 can be described as a fantastic time for investing through beta: following the indexes and a passive strategy; significant economic returns were generated simply through market exposure. This presented a high hurdle for active managers to drive differentiated results, and the absolute amount of alpha generated in this period declined meaningfully. Monthly alpha generated was as low as 5 basis points per month across our measurements, gross of fees.

In many cases, the alpha measured was statistically insignificant. It's no wonder than active investors felt they did not receive great value from their hedge fund exposures during this time.

There are many possible explanations for why this occurred. We can look at changes in factor betas across aggregate hedge fund exposures, or analyze the impact of dispersion or correlation dynamics across single-name securities. (For a complete breakdown of these elements, please refer to the full academic paper or our GitHub site.)



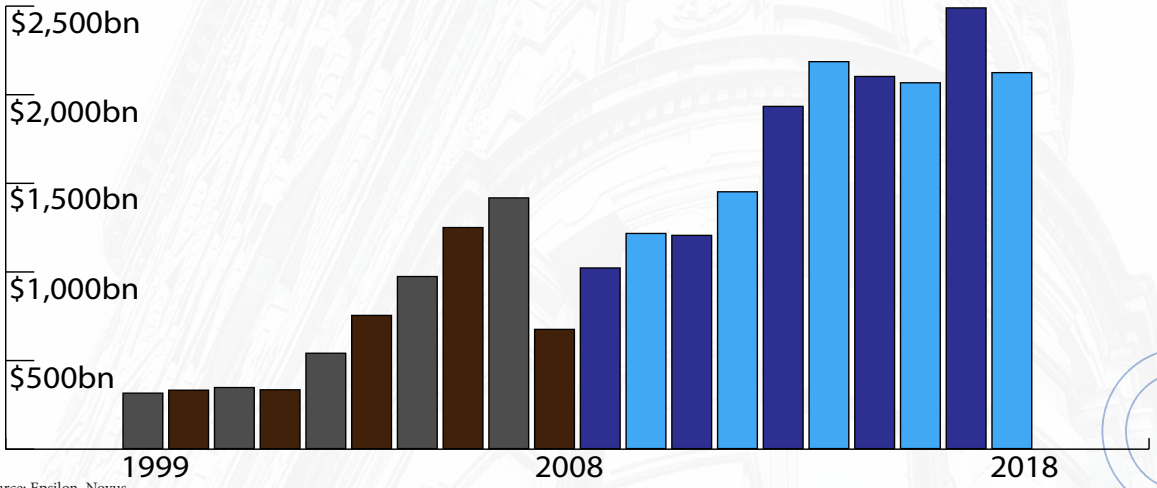
Period 2 - Mean Monthly Return vs Monthly Alpha

Source: Epsilon. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

We can even try to tease out the impact of the much larger figure for total hedge fund assets in the observed period (see bottom chart).

While ultimately outside the scope of this report, the drivers of this underperformance appear to be multi-faceted and require a thoughtful evaluation by capital allocators to ensure they are making wise investments.

Aggregate Reported HFU Assets Per Annum (1999 – 2018)



Source: Epsilon, Novus.
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Hedge Fund Best Ideas

- "Best Ideas" are the positions which – by definition – represent a hedge fund's highest expected return
- Best Ideas as a standalone generate alpha against the market
- However, we find no substantial evidence that Best Ideas ("Best") outperform the rest of their firms' portfolio positions ("Rest")
- This calls into question the attention given to Best Idea-themed conferences and dinners

As described earlier, our report finds that hedge fund managers as a whole have been able to generate statistically significant alpha through their long stock portfolios. This demonstrates the existence of stock picking skill across a significant universe of hedge fund managers. And while we further found that aggregate alpha has receded over time, some might protest that the very best ideas of fund managers continue to outperform.

Advocates of this view might point to prior research regarding the outperformance of mutual fund Best Ideas, the very existence of "best idea" strategies, and single-company co-investment opportunities as evidence for the market's belief in best ideas. We decided to test whether this faith is warranted; that is, whether the revealed Best Ideas of fund managers do in fact deliver abnormal returns.

Methodologies to Identify the "Best"

To start, we needed to precisely define what we mean by Best Ideas, and how we could test these positions for meaningful outperformance. The advantage of working with position-level data means we can disassemble portfolios at the constituent level, with the goal of separating the "wheat" from the "chaff."

In our study, we present nine methodologies for identifying Best Ideas. (Having no prior insight toward what might constitute the managers' Best Ideas – or what they might consciously consider their Best Ideas – we take multiple approaches to finding the answer.) Admittedly, what we can glean is only an approximation based upon the weight vector of portfolio positions, but that weight vector contains valuable information.

List of Best Idea Methodologies

Method	Tilt Metric	Description
r_1	$w_{ik} - \overline{w}_k$	Market Tilt
r_2	$\sigma_k^2(w_{ik} - \overline{w}_k)$	Variance-adjusted Market Tilt
r_3	$w_{ik} - \widetilde{w}_{ik}$	Intra-Cap Weight Tilt
r_4	$\sigma_k^2(w_{ik} - \widetilde{w}_{ik})$	Variance-adjusted Intra-Cap Weight Tilt
r_5	$(\Sigma w_i)_k$	Mean-Variance Tilt
r_6	$(\Sigma(w_i - \overline{w}))_k$	Cap-Weight Adjusted Mean-Variance Tilt
r_7	$(\Sigma(w_i - \widetilde{w}_{ik}))_k$	Intra-Cap Weight Adjusted Mean Variance Tilt
r_8	w_{ik}	Portfolio Weight / Zero Tilt
r_9	$w_{ik} - \overline{w}_k^{hf}$	HFU Tilt

We deduce the manager's Best Idea through varying systematic approaches at handling a portfolio; the nine methodologies we employ represent a full spectrum of potential ways to engage the problem, with the first four methodologies (r_1-r_4) coming directly from Randolph Cohen, Christopher Polk and Bernhard Silli's seminal 2010 paper, "Best Ideas." Each method has its roots in rational portfolio management.

Principally, our methods look at each position's weight in order to determine a relative "tilt." The simplest understanding of tilt can start with a relative weight calculated against the passive market benchmark.

For example, if we look at a manager's portfolio and note a position in Apple at 4%, that may be the manager's top position weight, but it may not be its top tilt relative to its total US equities portfolio given Apple's significant market capitalization.

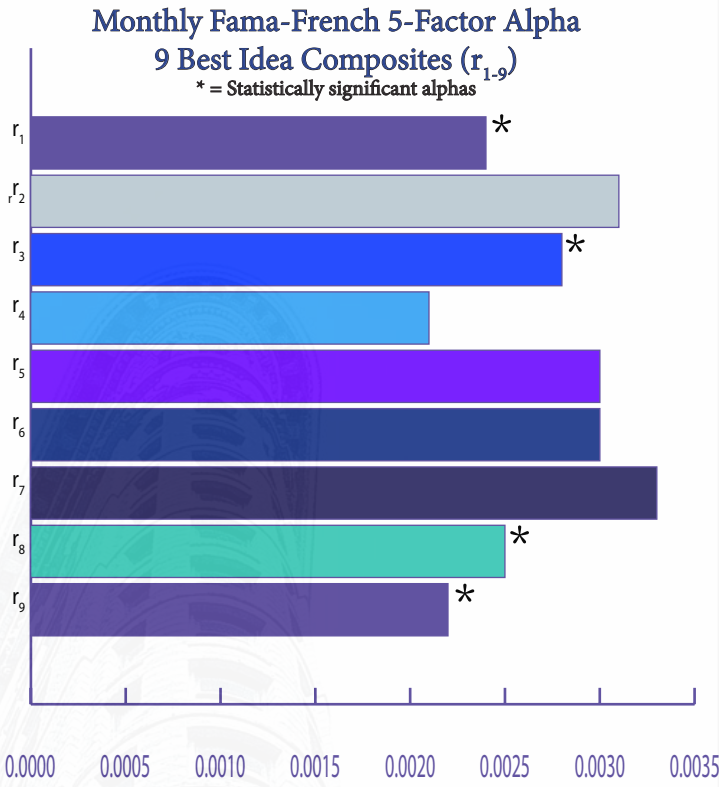
Each of our methodologies is a variant of this thinking, including several that take into account the riskiness of securities, handicapping larger position sizes in less risky securities. Our other methodologies assume a standard portfolio construction philosophy across all funds, allowing us to elicit the names with the highest mathematical expected return relative to risk. All of this is designed to tease out different flavors of Best Ideas.

Each of our methodologies is a variant of this thinking, including several that take into account the "riskiness" of securities, handicapping larger position sizes in less risky securities. Our other methodologies assume a standard portfolio construction philosophy across all funds, allowing us to elicit the names with the highest mathematical expected return relative to risk. All of this is designed to tease out different flavors of Best Ideas.

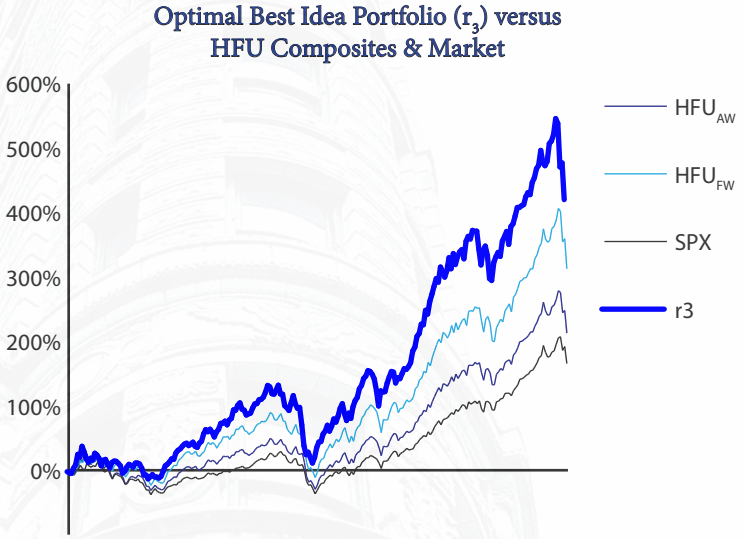
Testing the "Best"

Now we're ready to walk through some of our results, starting with the performance of our Best Idea composites constructed from these methodologies. For the sake of simplicity, we'll show alpha as measured against the Fama-French 5-Factor model of assessing stock returns, rather than all three of the factor models we used in our study (Fama-French 5-factor model; Carhart 4-factor model; Hue, Xue and Zhang q-factor model).

Instead of constructing composites that represent all reported assets across all funds, we extract the single best idea for each fund manager to construct a composite portfolio of Best Ideas across our universe of fund managers. Positions are equal-weighted and multi-counted if the Best Idea shows up more than once (as it often does). The nine different runs pictured here represent the nine different Best Idea methodologies in our study.



Source: Epsilon, This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.



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Effectively, what we are testing is how a portfolio comprised of the Best Ideas from each hedge fund manager would have performed each quarter over twenty years.

Each of our Best Idea methodologies generates an alpha term against the Fama-French model. The results vary, with methods r_2 and r_7 seemingly producing the biggest numbers. However, only methodologies r_1, r_3, r_8 and r_9 generate statistically significant alpha.

These findings demonstrate that Best Ideas do generate excess returns against the market.

"Best" versus "Rest"

Having established that hedge fund Best Ideas generate alpha, the next important question is how those strategies compare to the aggregate portfolios of our hedge fund managers.

After all, we want to better understand if these "Best" Ideas, often presented at meetings, idea conferences and dinners, outperform the "Rest" of their portfolios.

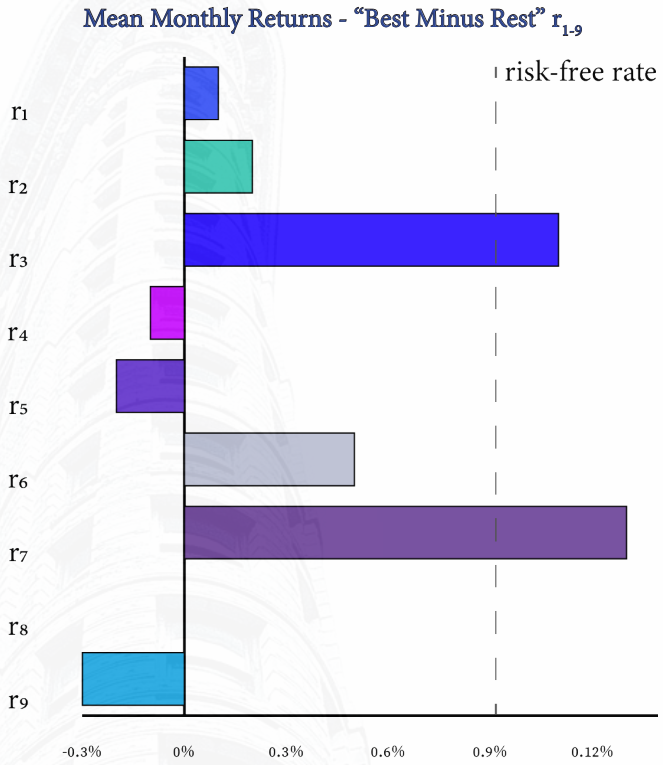
To answer this question, we designed and performed two separate experiments to isolate the magnitude of alpha between Best Ideas and Rest Ideas.

We started by constructing market-neutral portfolios that were long our Best Ideas composites (r_{1-9}) while shorting the Rest of the portfolio positions not captured by those methodologies. This provides the cleanest comparison of the performance characteristics of these Best Ideas and the Rest of the portfolio positions.

This approach is similar, though not exactly the same, as constructing the short arm through our HFU_{FW} or HFU_{AW} composites. The difference here is that in stripping out the Best Ideas from the short book, we ensure that we aren't netting out some portion of the Best Ideas.

This exercise also allows for a simple representation of investment return as a proxy for value-add, or alpha. Market neutral portfolios are dollar neutral, so returns are either from a difference in style (e.g., long value, short growth) or from alpha.

In short, what we are seeing is that hedge fund Best Ideas do not outperform the Rest of their portfolios.



Source: Epsilon. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

The annualized returns of our market-neutral constructs are represented in the chart [to the right]. As seen, the annualized returns for our market-neutral composites are far less impressive than the Best Idea alphas demonstrated earlier via the nine methodologies. **Seven of the nine methods produce mean monthly returns less than the risk-free rate during the twenty year period.**

This is further driven home by our regression alphas, which are statistically insignificant for all 9 of our Best-Rest market neutral portfolios.

"Rest" Portfolios

We further analyze the alpha characteristics of hedge fund portfolios by progressively removing their "Best Ideas" and isolating the "Rest Ideas". These are certainly not ideas being pitched! Doing so allows us to test if some portion of these Rest Ideas broadly mirrors the market, or could be viewed as portfolio filler.

We find little evidence of deteriorating alpha as we remove larger baskets of Best Ideas, contrary to what would be expected in the event of Best Idea outperformance vs. Rest Ideas.

While hedge fund Best Ideas generate statistically significant alpha, it does not appear that they outperform the Rest of the managers' holdings. We established this with our market-neutral portfolios.

Earlier academic research argues that mutual funds pad their portfolio with "filler" to allow them to gather assets profitably. Presumably, that would suggest that Best Ideas outperform the Rest of their portfolios, and in the case of mutual funds, that has been demonstrated through an empirical analysis of mutual fund portfolio positions (Cohen, Polk, Silli).

To understand this discrepancy with hedge funds,

After removing progressive amounts of Best Ideas, our shrinking Rest Idea portfolios generated similar alphas, indicating no deterioration.

we further tested the behavior of the Rest of their books. We did this by progressively removing the Best names from each manager's portfolio to construct baskets of "Rest Ideas". In essence, we are isolating the leftover ideas defined by each tilt metric. The point is to reinforce our understanding of how weaker positions, as defined by our Best Ideas tilts, behave across hedge fund portfolios.

If mutual fund research translates to hedge funds, and those hedge funds are truly padding the bottom of their portfolio with weaker alpha-generating holdings, we would expect alpha to trend downward as we continue to remove the top Best Ideas from each portfolio.

The nested charts in the following page show the alpha of these 'Rest' portfolios as we progressively remove wider bands of Best Ideas. They start by removing just the single Best Idea (Ex 1), all the way up to Ex 20. As we have 9 different methodologies and 3 different factor models of analysis, the chart is grouped by band (Ex 1, 5, 10, 15, 20), skill methodology ($r_{1\text{-}9}$), and factor model (Carhart, Fama French, Q).

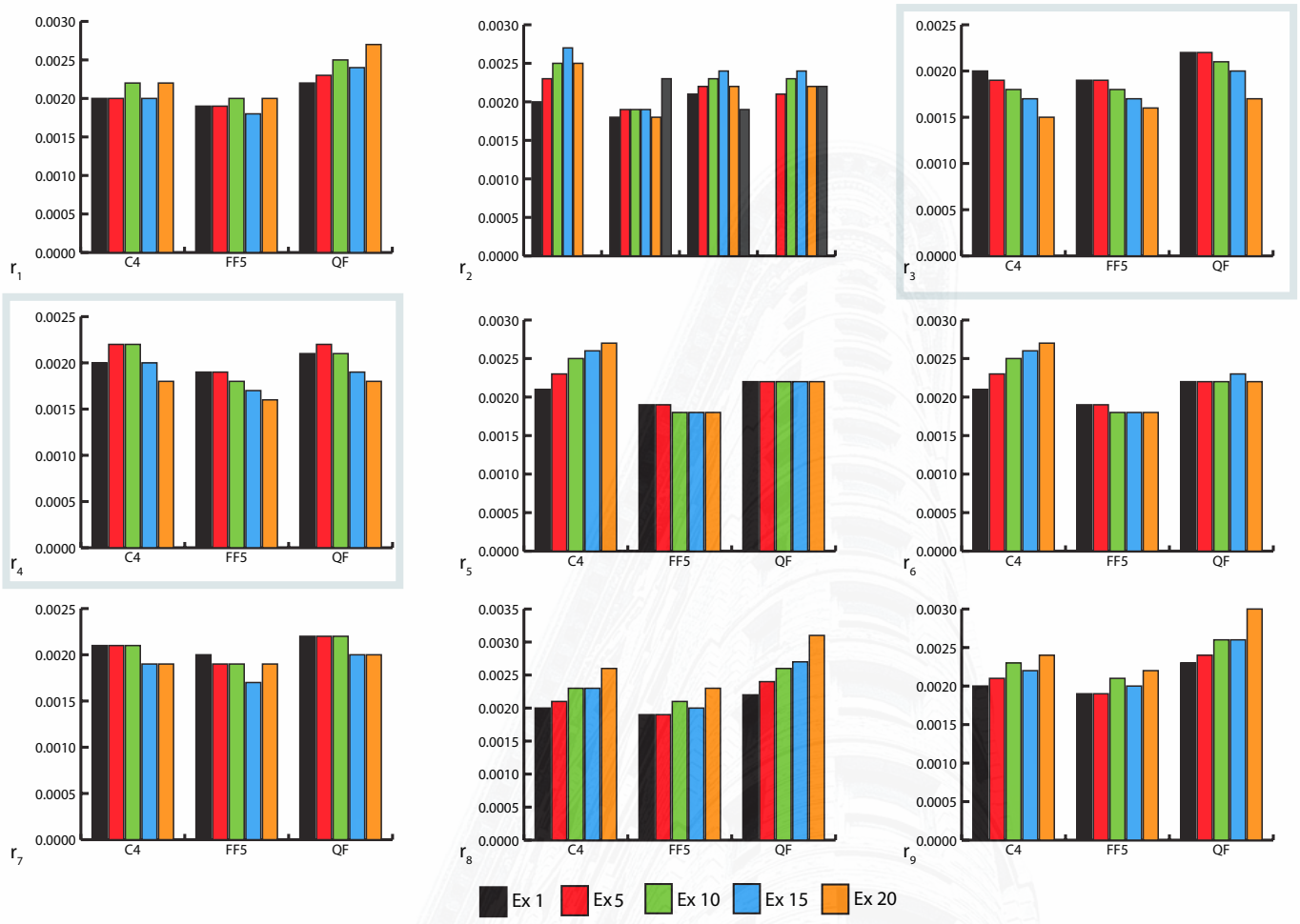
A common practice at hedge funds is that the portfolio manager is the decision-maker for core positions while junior analysts control smaller names, so a difference in alpha generation could be hypothesized between these two. However, our findings generally do not demonstrate that. We really only see a decline in alphas as exclude

We really only see a deterioration of alpha in Rest Idea portfolios with methods r_3 and to a lesser extent r_4.

more Best Ideas through methodologies r_3 and to a lesser extent r_4.

You'll recall that r_3 was the Best Idea methodology which produced the most robust outperformance in our standalone Best Ideas analysis. Why is it that r_3 seems to behave well? In the r_3 methodology, we take the portfolio of each manager and construct a separate benchmark, representing the market capitalization-weighted version of their existing portfolio positions. From there, we calculate each security's tilt in order to divine Best Ideas. This can be a helpful approach for funds that are sector-specific, where relative volatility can be misleading, or for funds that are market cap-specific, where tilt versus the aggregate market is also misleading.

Rest Idea Portfolios - Monthly Alphas
Grouped by Exclusion Band x Factor Model



Source: Epsilon. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

Beyond The Study: Virus and Volatility

- Our report looked at the years 1999 to 2018, but its release coincides with the COVID-19 crisis and the extreme volatility it has produced in capital markets around the globe
- We expect that our readers are curious to know how our findings over the prior two decades compare with more recent trading, in light of the latest events
- Although it is outside the scope of our report, here's what we found when we looked at 2019 and 1Q 2020

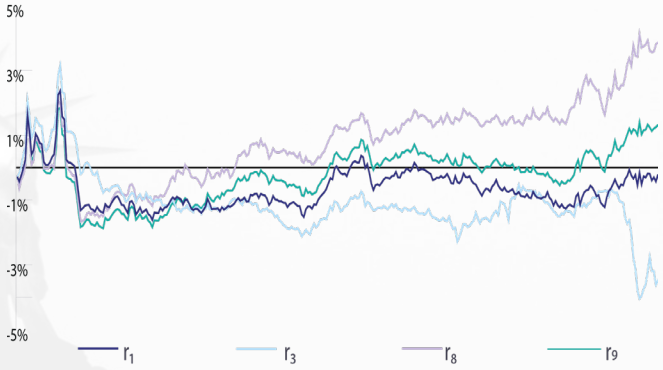
Both of our composite portfolios generated underperformance in the extended period (2019 - 1Q20), continuing the trend from the second period we studied in the report. The manner in which this happened is noteworthy:

- HFU_{FW} (our fund-weighted composite) underperformed the market by 9%.
- HFU_{AW} (our asset-weighted composite) underperformed by 5%.
- These are rather striking numbers.

- HFU_{FW} underperformed HFU_{AW} reversing what we found in the twenty-year study period.
- This can be interpreted as larger funds doing a better job of protecting capital than their smaller counterparts.

- **Balance sheet quality appears to have been the determining factor in this underperformance.**
- Since the dates of our original study, hedge funds have been invested in more aggressively-postured companies; these companies broadly underperformed in 1Q20 versus those with stronger balance sheets.

Best Minus Rest - Market Neutral Returns
Jan 2019 - Mar 2020

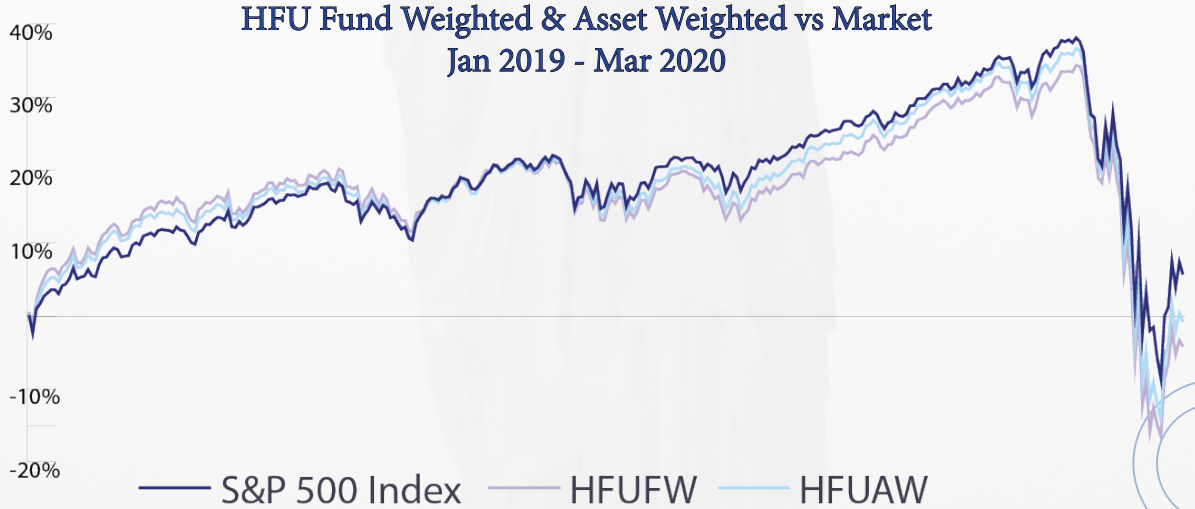


Source: Epsilon. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

- **Best Ideas broadly underperformed the market during the extended period by approximately 5%, depending on methodology.**

- There were signs, however, that some Best Ideas outperformed the Rest of their managers' portfolios in 1Q20 (see chart above)

HFU Fund Weighted & Asset Weighted vs Market
Jan 2019 - Mar 2020



Source: Epsilon, S&P Global. This analysis is subject to certain limitations and does not represent portfolios that Epsilon manages. Please see the last page for more detail on data and assumptions.

About Epsilon

- We are a quantitative investment firm providing boutique solutions to institutions and family offices
- Our research process focuses on bottoms-up stock selection through a systematic process, predominantly in domestic equities
- Our investments aim to provide the compelling aspects of passive investing – low fees, transparency, liquidity – with the pursuit of active alpha generation
- We deliver our products through separately managed accounts

Securities and Exchange Commission Section 13-F holdings data is sourced from Novus Partners. Security pricing is sourced from CRSP, covering assets traded on NYSE, NASDAQ, and AMEX with share codes 10 and 11. Securities are cross-linked to Form 13F holdings. We source factor data for the Carhart and Fama French asset-pricing models from Ken French's website. Factor data for the Q Factor model was kindly furnished by Lu Zhang.

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