

The logo for Bivium Capital, featuring the word "BIVIUM" above "CAPITAL" in white serif font on a dark blue rectangular background.

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Risk and the Real World

Conversations regarding active management tend to center around relative return. Proponents focus on purported alpha and the ability of skilled and motivated investors to add value above the market. Skeptics point to studies showing that the average active manager underperforms the market net of costs. In either case, the decision hinges on whether the relative return is above or below where one needs it to be (e.g. the benchmark, spending rate, inflation). The goal of this piece is to expand the perspective one might have regarding return from point estimates (e.g. annualized excess return was $x\%$ over some timeframe) to ranges of outcomes (e.g. what was experienced in the path to that annualized excess return value). The hope is that with this framework any decisions made when evaluating active manager performance can be more robust by grounding them in rational expectations rather than emotional assessments.

Fundamentally, risk can be seen as the probability of not meeting one's expectations. In this context, risk may lead to positive or negative outcomes, but most focus is given to downside risks (a negative result on both an absolute and relative basis) and opportunity costs (a positive result on an absolute basis, but a negative result on a relative basis). The challenge is in defining what those expectations should be and determining how to react when outcomes diverge meaningfully from those expectations.

Let's start with a simple example. Suppose you were evaluating US small cap core equity managers. Looking at data for the ten years ending December 2013, you would see that the median manager produced an annualized excess return over those ten years of 1.5% with a tracking error of 2.9%. The resultant information ratio – defined as excess return over tracking error – of 0.5 could be considered good, but not unreasonably so. Setting aside for now the fact that diligence is much more involved than this, at some level one of the first hurdles to cross would be whether that 1.5% excess return is enough?

Let's assume that it is. Then if the next ten years prove to be somewhat approximate to the prior ten years, it may be reasonable to expect a similar level of excess return achieved. One could thus be satisfied. However, a strong assumption made in this scenario is that the investor had the wherewithal to stay invested for the entire time period. Any deviation from that and the results achieved could be considerably better or worse than expected. Looking at the same median manager from before, the

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maximum excess return for a one year period was 7.2% while the minimum was -6.6%, a range of over 13%. Using a “standard” market cycle timeframe, there were three year periods within the ten years where results were much better (4.8% annualized excess return) and much worse (-2.2% annualized excess return). If one had had the bad fortune to have encountered the three year negative stretch of excess returns up front, would the investor have stayed invested with that manager?

To continue putting some more numbers around the challenge, instead of looking at the median manager let’s look at the top decile of performers over the ten years. In US small cap core equity, the managers in the top decile outperformed by an average of 4.9% annualized over the ten year period. The average tracking error was 7.4% for an information ratio of 0.7. However, over that same timeframe the average maximum excess return for a one year period was 28.1% while the minimum was -12.9%, a range of close to 41%! Using a “standard” market cycle timeframe, there were three year periods within the ten years where results were much better (13.3% average annualized excess return) and periods where they were somewhat worse (-2.2% annualized excess return – interestingly similar to that of the median manager). Again, if one had had the misfortune to have encountered the three year negative stretch of excess returns up front, would the investor have stayed invested with that manager? In this case, the opportunity cost of lost returns would have been much more significant.

The answers may well depend on what range of expectations the investor had at the time of initial investment. Too often in practice the threshold of acceptable underperformance is determined or assessed as a portfolio is experiencing it. Given the other stresses that may be occurring in the market at the time, emotional perspectives and/or behavioral biases can often muddle decision making. This may be one reason the oft-cited studies by financial research firm DALBAR continue to show that the timing of investor decisions when buying and selling funds leads to worse outcomes and diminished wealth. However, there is a fine line between being patient and being complacent. That is why one should attempt to develop robust (i.e. market-agnostic) expectations in advance.

One way to start would be setting bands around expected performance. A common way to do this utilizes a statistical framework developed around tracking error and expected excess returns. Assuming a normal distribution of returns data (which is a bigger assumption for some managers than

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others), roughly 68% of outcomes could be expected to fall within one standard deviation of the mean or, in other words, within a band of the expected return plus or minus the tracking error. Using the median US small cap core equity manager from above, the range would be -1.4% to 4.4%. A possible underperformance of 1.4% would probably be manageable, but that range leaves almost a third of outcomes unassessed.

Broadening the bands, roughly 95% of outcomes could be expected to fall within two standard deviations of the mean or within a band of the expected return plus or minus two times the tracking error. For the median manager, the range would be -4.2% to 7.2%. A potential underperformance of 4.2% may be more difficult to stomach, particularly given the modest expected return of 1.5% that was targeted, but the wider band makes that a more pertinent value to assess. As an aside, I understand that this may all be playing a bit loose with the statistics as we are using annualized geometric means and standard deviations of monthly data to assess returns over any 12 month timeframe. However, the rough magnitudes should be sufficient for the purposes at hand.

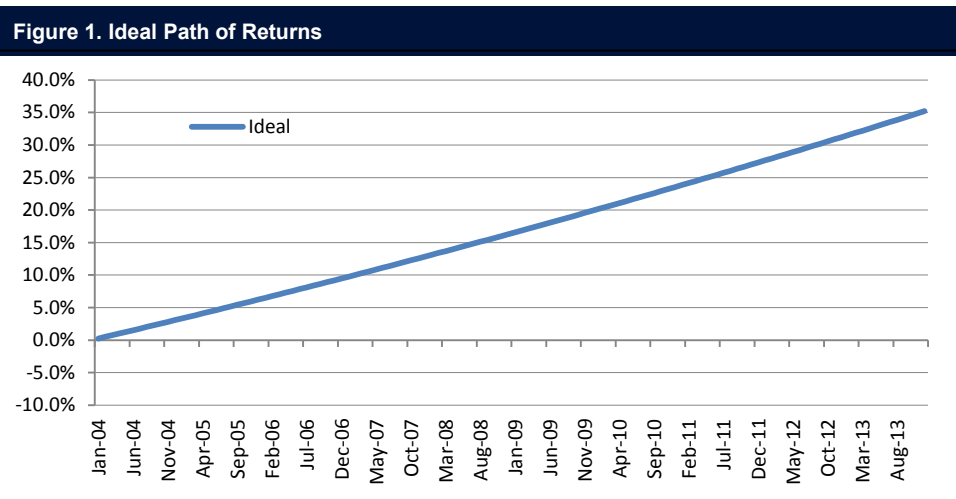
So how does all of this fare in the real world? Over this same ten year timeframe, the median US small cap core equity manager had a worse one year underperformance of -6.6%, a full 50% worse than even the two standard deviation estimate. Focusing on just the downside, a normal distribution would have had about 2.3% of the outcomes falling below two standard deviations. In this case, closer to two times that or 4.6% of the outcomes did so. So while the estimate of a 4.2% underperformance was probably reasonable, it may not have fully captured the real downside. That is where stress tests and scenario analyses can be useful supplements.

Stress testing and scenario analysis are risk management methods which use historical data to attempt to quantify what may happen with a portfolio by looking at what has happened. For purposes of this discussion, the most relevant measures are maximum drawdown figures over different timeframes. By calculating these values, one can get a fuller picture of the history of performance shortfalls which may or may not have been captured using the statistical methods. The worse one year underperformance measure is one example. The worse three year underperformance would be another. For the median US small cap core managers, the worse three year underperformance was -2.2% annualized. Even if the potential investor could manage a one year period of underperformance on the order of -6.6%, could they manage three years



of underperformance on the order of -7.7% cumulatively? If they could have managed it, the next three years would have seen a cumulative outperformance of 11.6% (3.2% annualized). Unfortunately, many investors would have given up by then – unless they had set their expectations properly. And remember the top decile US small cap core equity managers? Those that outperformed by an average of 4.9% annualized over the ten year period? Those managers had on average a worse one year underperformance of 12.9%!

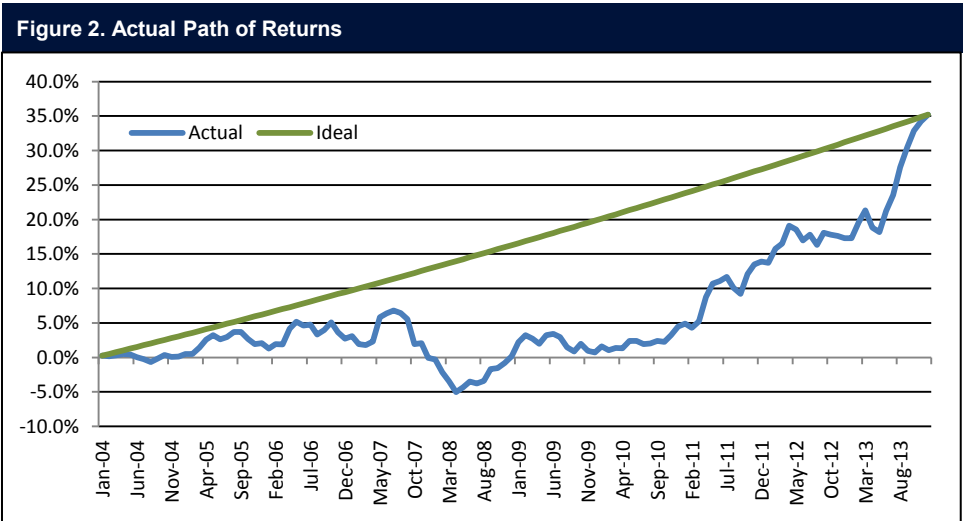
Hopefully all of this has illustrated the limits of point estimates when it comes to assessing risk. It also highlights the resolve needed when investing with active managers. Active returns will, by definition, be variable, and while everyone is happy with upside deviation, we need to be prepared and willing to endure the downside deviation as well. For some investors, the discomfort with variability, either through temperament or an assessment of career risk, may cause them to eschew active investing entirely. After all, benchmarks don't underperform (although their passive proxies may). However, even a modest excess return of 1.5% annualized equates an additional 35.2% cumulatively over ten years. In a period of more muted asset class return expectations, that 35% would certainly be meaningful.



[Source: Bivium, eVestment Alliance]



But, as we have been discussing, the journey is seldom straightforward.



[Source: Bivium, eVestment Alliance]

It’s worth keeping in mind that the discussion so far has only focused on quantifying expected return volatility. It does not address the conditions under which such performance may be expected to occur or whether, given the characteristics of the investment, it was supposed to occur. For a skilled manager – one whose return is more due to alpha than beta – much of the volatility around excess return should be driven by the particular style that the manager employs. Therefore, even if the magnitude of a period of underperformance is within expected bounds, the drivers of it should determine whether any action should be taken. These can be topics for another day.



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