

# HIGHER TRACKING ERROR: BE CAREFUL WHAT YOU WISH FOR

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## Executive Summary

Institutional and individual investors continue to be challenged by prospects for lower expected investment returns on financial assets. With the average annual return on the S&P 500 Index barely positive over the past 10 years, and the yield on the 10-year U.S. Government bond hovering at around 2%, many investors have increased their allocations to higher expected return and alternative asset classes. Within equities, a popular model is the so-called 'barbell' approach, wherein a passive index allocation is complemented by active strategies with high tracking error and high alpha objectives. The barbell approach intentionally ignores strategies with low-to-medium tracking error on the premise that the alpha generated is likely to be relatively small, potentially not meaningful to the overall plan, and possibly not worth the due diligence expense. But does this really make sense?

At the heart of the issue is that more tracking error does not necessarily mean more alpha. This can be seen theoretically as well as empirically. Our findings indicate that the barbell approach may not be as effective as less extreme approaches to equity investing.

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## Does more tracking error mean more alpha?

Not necessarily.

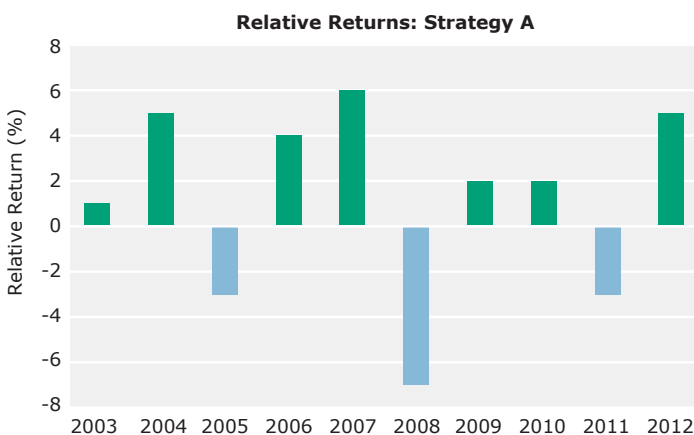
Beating an index by a fixed amount, year in, year out, with a fully invested all-long equity portfolio is rightly regarded as a financial impossibility. After all, if one could beat the S&P 500 Index by even 1% a year with certainty, portfolio oversight and meeting liability obligations would be easy. It seems that some variability in relative returns is inevitable if one wants to beat the index consistently over the long term. The question is, how much variability does one have to endure to realize a particular average excess return?

This is where the concept of information ratio is so useful. In this context, the variability of relative returns is expressed as the tracking error. The information ratio shows the ratio of average relative return to the tracking error, as in the following familiar equation:

$$\text{information ratio} = \frac{\text{excess return}}{\text{tracking error}}$$

Information ratio is one of the best measures of individual manager skill, particularly for those strategies that seek to outperform benchmarks consistently over time (versus low-volatility equity strategies, which also seek to outperform over time, but with different risk objectives). A strategy with a high true information ratio may reasonably be expected to outperform the benchmark with consistency across all market cycles.

FIGURE 1  
RELATIVE RETURNS FOR TWO HYPOTHETICAL STRATEGIES



For example, Figure 1 shows the relative returns over a 10-year period for two hypothetical strategies. As it turns out, both strategies have the same total excess return over this period,<sup>1</sup> but strategy B has delivered its excess returns more consistently than strategy A. Since the strategies have the same alpha, but B's tracking error is much less than that of A, strategy B's information ratio is higher than strategy A's information ratio.

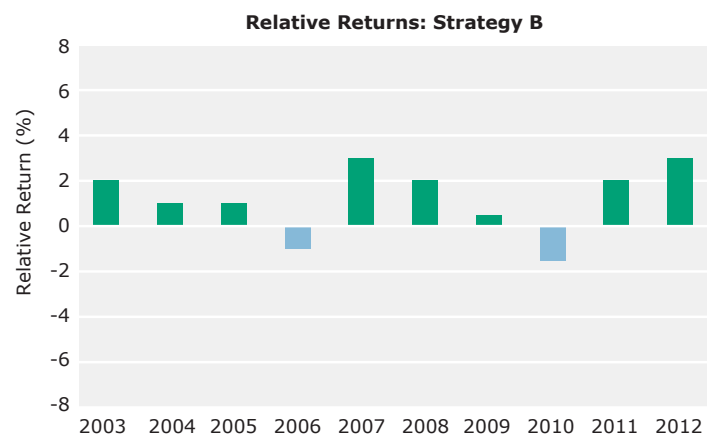
If strategy A, instead, had the same information ratio as B, then the strategy with the higher tracking error (namely, A) would have a higher expected excess return. Indeed, the equation above can be restated as follows:

$$\text{excess return} = \text{tracking error} \times \text{information ratio}$$

In other words, given two skilled managers with equally high information ratios, the one with the higher tracking error will have the higher alpha. For this to be relevant, one must actually be able to identify skilled managers. This leads to the natural question: how does manager skill vary with tracking error?

## Information ratio and tracking error

All else equal, if tracking error is increased, there are conflicting viewpoints as to whether the information ratio should decrease, increase, or stay the same. One point of view is that the information ratio should be higher because the increased tracking error is a manifestation of the manager's greater concentration into his or her highest-conviction securities. If the manager is



<sup>1</sup> Technically, the total excess return is only the same if the relative returns depicted in Figure 1 are logarithmic

forced to control tracking error, the story goes, then the best ideas of the manager are not being fully captured due to the risk control. On the other hand, most investors want and need some diversification in their portfolios. Otherwise, why not simply hold the single stock about which the manager has the most conviction? When pushed to this extreme, it seems clear that some sort of risk control is appropriate, if only in the relatively simple form of having a minimum number of stocks in the portfolio.

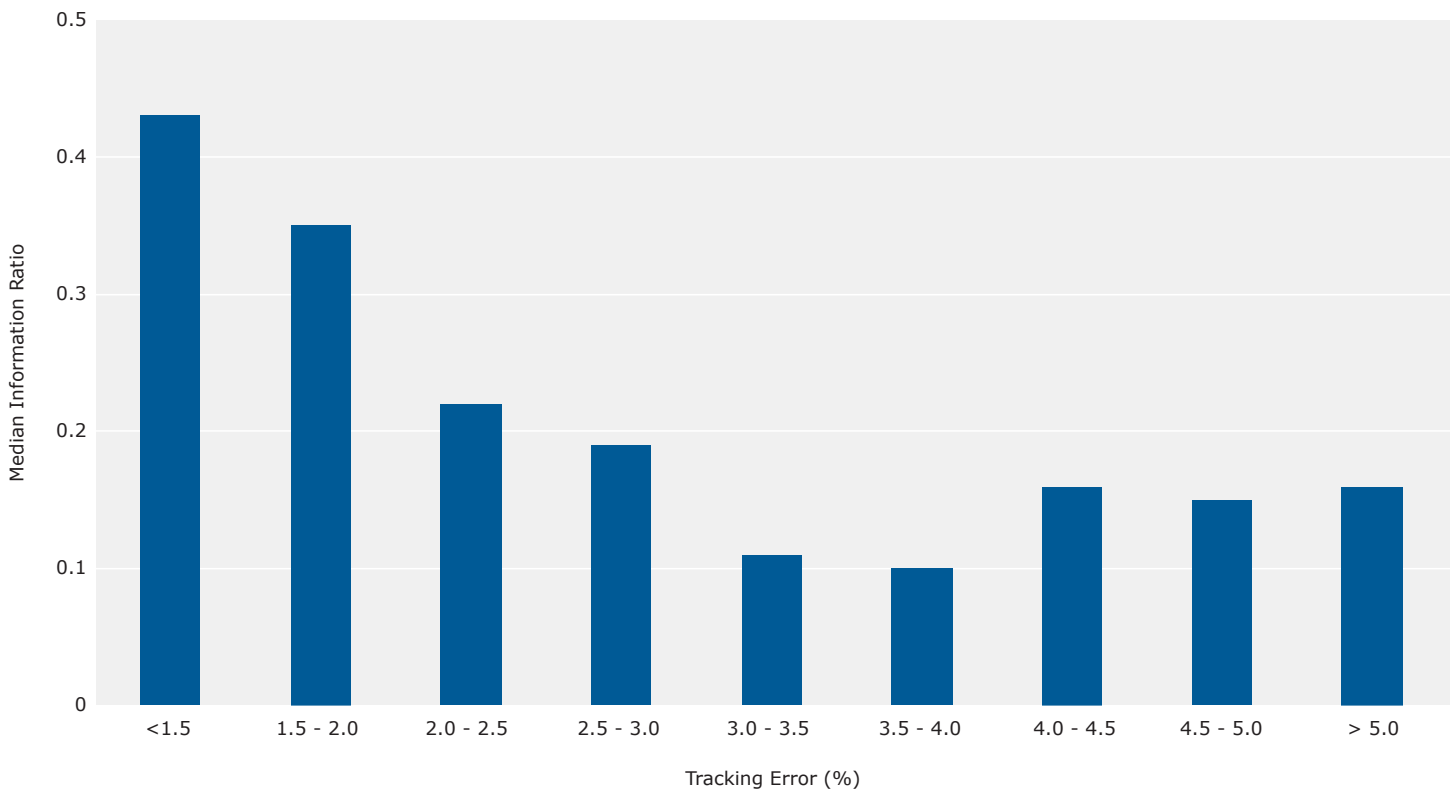
The above viewpoint may not be so relevant for quantitative or combined fundamental/quantitative approaches. These strategies typically consider the portfolio as a whole, taking into account interactions and correlations between stocks. For such a strategy, increasing the active weights or pushing harder on the alpha sources would typically increase the tracking error. The information ratio may well decline, however, since the portfolio would most likely not be permitted to hold short positions. This tends to limit the amount and efficiency of the generated alpha.

Empirical performance data suggest that information ratio does indeed decrease with higher tracking error, at least up to a point.


We analyzed manager performance for all U.S. active large-cap equity managers of any style with a 10-year or longer track record within the eVestment Alliance database, 829 strategies in all. Ten years of gross-of-fee relative returns (as of December 31, 2012) versus each strategy's preferred benchmark were used to gauge the tracking error and information ratio of each strategy. While the observed information ratios are likely to be skewed upward due to survivorship bias, there is no reason to assume that this bias affects strategies with low tracking error more than strategies with high tracking error.<sup>2</sup> The observed information ratios are collectively a reasonable indicator of the range of manager skill within a sufficiently large sample.

Figure 2 displays the results of this study. The bars show the median information ratio by tracking error. The results are striking: median information ratio decreases significantly with increased tracking error — up to about 4% — and reaches an equilibrium of about 0.15 thereafter. After fees, which are often significantly higher for high-tracking error strategies, and survivorship bias are taken into account, the realized median information ratio may be quite close to zero for high tracking error strategies.

**FIGURE 2**  
**MEDIAN INFORMATION RATIO BY TRACKING ERROR FOR 829 LARGE-CAP U.S. ACTIVE MANAGERS**



<sup>2</sup> If anything, strategies with high tracking error may be skewed upward in information ratio more than strategies with low tracking error due to the increased likelihood of extreme negative performance bringing about the downfall of high tracking error strategies.



Such a strategy would have no long-term expectation to beat the benchmark. Is there a benefit to increasing the tracking error after this equilibrium point? While recognizing that each investor has unique objectives, we feel that blindly increasing tracking error, without considering the information ratio, is perilous.

## Information ratio and manager selection

Manager selection is difficult. Plan sponsors spend many hours and millions of dollars on due diligence and/or consultant fees on this. Many have given up on active management altogether, although the results above do confirm that skilled active managers are able to add value even in the large-cap U.S. equity space. A higher true information ratio increases the confidence that a strategy will achieve its alpha target in a shorter time period, and is a desirable property. Generally, an information ratio above 0.3 is regarded as good; this is corroborated by the manager data, which shows that an overall median information ratio of 0.18 and that an information ratio of above 0.41 is in the top quartile. Screening by tracking error, and in light of the above figure, we find that nearly two-thirds of the managers with a tracking error below 2% achieved a 10-year information ratio above 0.3, whereas only one-third of the managers with tracking error above 2% surpassed that mark.

While the goal of an effective due diligence effort is to decrease the odds of selecting a poor manager, the above analysis suggests that the task is clearly more difficult for strategies with higher tracking error, as the median manager appears to have less skill. Indeed, due diligence efforts for higher tracking error strategies often prove to be more costly in terms of time and money, and rightly so: the ramifications of picking the 'wrong' high tracking error manager could last for years, and negatively impact the ability to meet long-term funding obligations. There is less risk in manager selection within low tracking error strategies for two reasons: the risk of short-term underperformance to the overall plan is lower, and the risk of selecting a poor manager is lower.

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## Conclusion

All this suggests a scientifically motivated, alternative approach to the core-satellite barbell model. A due diligence budget (in both time and money) can be allocated by tracking error. Strategies with high tracking error offer the potential for greater alpha, but come with a higher bar for selection and governance as well as higher volatility of excess returns. The allocation to these strategies must be somewhat limited in size, due to available manager capacity and for the overall tracking error of the equity allocation to be maintained. Strategies with lower tracking error should not be neglected; these strategies can accommodate greater allocations, carry lower risk in the realm of both short-term large underperformance and manager selection, are more consistent and can have a bigger impact on the overall equity performance. They therefore use up less of the overall governance and risk budget. Passive approaches can be used at any desired level to control the overall tracking error. This approach not only makes better use of the available opportunity set, allowing managers to operate within their best skill sets; it also recognizes that more tracking error does not necessarily mean more alpha.



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