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CAPITAL ADVISORS, LLC

Mill Creek Research Perspectives

Managing Equity Portfolio Risks

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Mill Creek Research Perspectives: Managing Equity Portfolio Risks

In 2017, we wrote at some length on the topic of risks taken within the equity portions of investment portfolios (see *Balancing Returns and Risks in Global Equity Portfolios*). In summary, that paper discussed two risk measurements: Absolute Risk and Relative Risk. The variability of returns – statistically, their standard deviation – is commonly used within the investment community to illustrate the absolute risk of a security or of a portfolio. It measures how much periodic returns differ from their longer-term average annualized (actual or projected) returns. For example, an equity portfolio with an estimated annualized return of +8.50% and absolute risk of 15.5% would be expected to produce one year returns within a range of +34% to -17% across most (90%) future market environments.

Relative Risk measures how much periodic returns (on individual stocks; on portfolios of stocks) differ from the returns on an unmanaged market benchmark (e.g., versus the Russell 3000 Index). The variability of excess returns (positive or negative) relative to returns on a benchmark is typically referred to as Tracking Error. Taking on risks relative to a benchmark can produce returns that deviate sharply – particularly across a relatively short time horizon – from those of the selected benchmark. For example, an actively managed portfolio that has successfully produced annualized excess returns of +1.00% with a tracking error of 200 basis points (2.0%) could beat the market by +4.0% or more in given 12-month period. It could also lag the market's returns by -3.0% or more across a 12-month period.

Investors cannot beat a market benchmark without taking risks relative to it, though taking relative risks does not in-and-of-itself insure investment success. Relatedly, risk-taking investors need to decide how narrowly or broadly they want to spread these risks (e.g., across multiple market sectors or investment styles; across a few or several investment managers). This paper takes a deeper-dive into the topic of managing relative risks in equity portfolios, comparing the riskiness, breadth of diversification, and likelihood of "successful outcomes" that can result from adding one or more managers taking average to above-average relative risks into a broadly diversified equity portfolio[1]. It also offers MCCA's perspectives on an approach to managing the uncertainties of unpredictable markets and the variability of active manager returns therein.

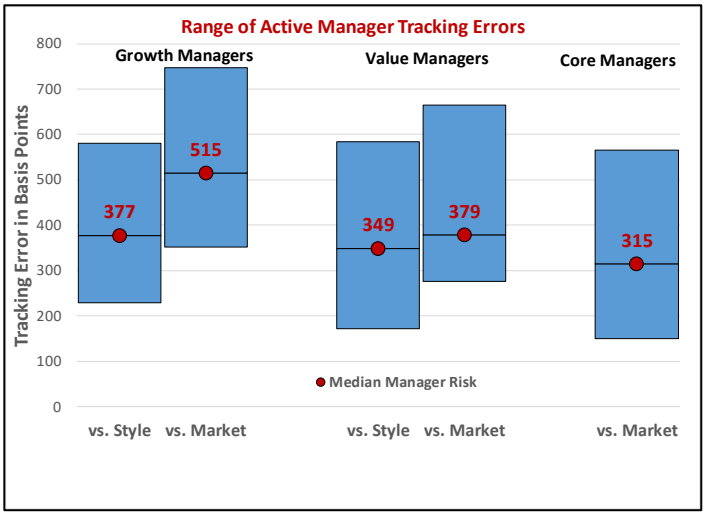
A Framework for Measuring Portfolio Risks

Virtually all actively managed portfolios – that is, strategies that consciously take risks relative to a market benchmark – articulate various investment guidelines and metrics with which they expect to comply when constructing and managing such pools of capital. A tracking error target is rarely one of an active manager's key inputs; most often it is one measurable outcome of their approach to managing a specific strategy. Self-defined limits on position sizes (e.g., no more than 5% of assets in a single

[1] *For the sake of simplicity, the analysis is confined to a portfolio comprised solely of large cap U.S. equity securities using the Russell 1000 Index as the market benchmark for this universe of eligible investments. Stocks included in the Russell 1000 Index comprise 92% and 50%, respectively, of the total market value of U.S. and global equities. The portfolio construction process, risk metrics, and return trade-offs are similar for non-U.S. and global equity portfolios.*

security), industry diversification more than a 2-times industry weighting in comparison to weights in a selected benchmark), total holdings in largest positions (50-60% in Top 10), and total number of positions (expect to own between 40-60 securities) are among the factors that ultimately produce much of a portfolio's tracking error.[2] Nor does any credible manager make firm predictions as to how much excess returns their approach will likely deliver in exchange for the risks being taken.

Though many active managers' recent inability to routinely beat market benchmarks has subjected them collectively to criticism, even in this environment a subset of managers has nevertheless beaten relevant benchmarks by a wide (i.e., by more than +100 basis points) margin net of fees. As shown in the chart below, a review of the historical risks taken by actively managed Large Cap U.S. equity strategies (growth, value, and core) shows that the range of tracking errors has varied equally widely within each type of strategy. So, too, has the distribution of excess returns produced from having taken varying amounts of relative risk. Across different strategies, relative turns on lower risk portfolios have fallen on average within a comparatively narrow range (i.e., a spread of 400 bp annualized between the best and worst performers). Higher risk portfolios, in contrast, have produced a wider range of relative returns (800 basis points separate the best and worst relative manager returns).



Investing in a single (or just two) higher risk active managers, therefore, may introduce more risk into a portfolio than some investors can tolerate. Such a program offers the potential for superior long-term outcomes but also the prospect that it may appreciably lag a market in the short-run. The table below shows why this might be the case: a single manager or two manager portfolio (in this example, a growth strategy combined with a value-oriented strategy) might own as little as 6-12% of the individual stocks comprising a broad market benchmark and no more than 30-45% of the market's overall capitalization. The resulting tracking errors of 265-480 basis points suggest the possibility of portfolio returns that fall as much as -3% to -5% short of the market across a single 12-month period if the portfolio's holdings are under-represented in the stocks and sectors that produce the period's best total returns. More positively, returns could also exceed the market by as much as +4% to +7% across 12 months.

Holdings and Risks by Portfolio Type

# of Managers Used	Holdings #	Holdings % of Mkt	% of Mkt Cap	Relative Risks (bp)
1 Manager	63	6%	31%	480
2 Managers	115	12%	45%	265

[2] *Some quantitatively managed funds, however, do "solve" for a targeted tracking error when constructing portfolios. Tax managed portfolios, for example, may seek to substantially match the risk characteristics of a market benchmark by owning only a subset of the securities that comprise that benchmark.*

Investors can reduce this so-called *manager risk* by adding additional managers to their portfolio. As shown below, multiple active managers pursuing different strategies (and, on balance owning portfolios with few over-lapping positions) reduces overall portfolio tracking error. But there is a point at which

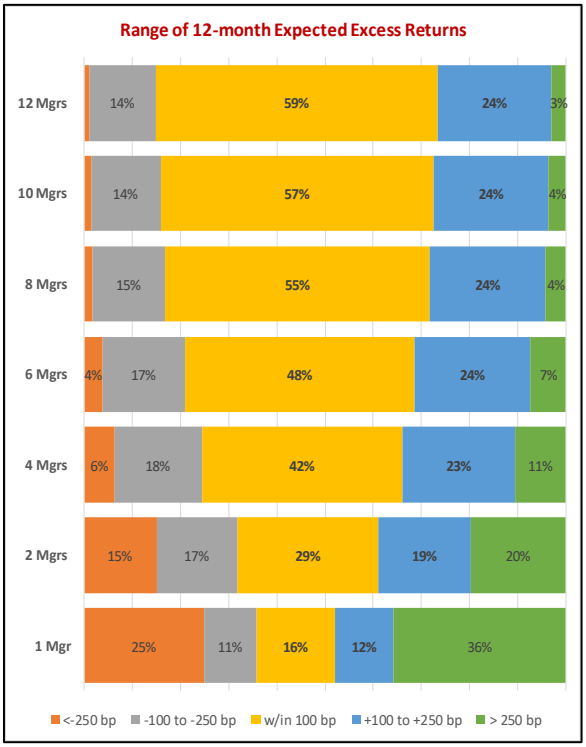
Holdings and Risks by Portfolio Type

# of Managers Used	Holdings #	Holdings % of Mkt	% of Mkt Cap	Relative Risks (bp)
1 Manager	63	6%	31%	480
2 Managers	115	12%	45%	265
4 Managers	246	25%	68%	180
6 Managers	289	30%	73%	155
8 Managers	317	32%	77%	130
10 Managers	351	36%	79%	125
12 Managers	376	38%	81%	120
Index ETF	979	100%	100%	0

efforts to reduce manager risk by adding managers creates an unintended (and undesirable) consequence. The aggregate portfolio may then be taking only a low level of relative risks versus the benchmark, constraining its ability to deliver excess returns and in effect becoming a high cost (owing to active managers' higher expenses) index fund. Our analysis shows that investing in 8 or more actively managed strategies can result in owning most (over 75%) of the market on a capitalization basis, diluting the respective managers' tracking errors and creating an overall portfolio tracking error of 130 basis points or less[3].

Multi-Managers: Opportunities and Risks

The chart below shows how the addition of incremental managers – and the resulting decline in overall portfolio tracking error – will likely result in fewer extreme (good and bad) relative return outcomes. Or, more straightforwardly, less tracking error makes for a greater likelihood that annual portfolio returns are close to (within +/- 100 basis points) the overall market. At the extreme, a 12-manager portfolio with overall tracking error of 120 basis

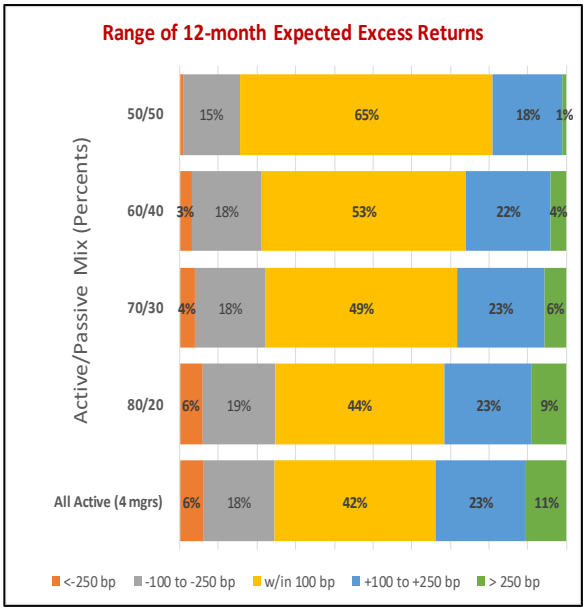


points will only rarely (about 3% of the time) produce 12-month excess returns that exceed +250 bp. Likewise, truly poor years (-250 bp) are similarly unlikely (about 1% of periods). The possibility that a 4-manager portfolio (projected tracking error of 180 basis points) would achieve such relative returns is greater: 11% chance for +250 bp or greater excess returns, 6% odds of -250 bp or worse relative returns.

An all-active portfolio – whether comprised of a single manager, a few managers, or many managers – results in a higher cost portfolio than one that only invests in index funds and

[3] *See Appendix for a description of the methodology used to derive estimates of portfolios' holdings and their prospective tracking errors versus a market benchmark (Russell 1000 Index)*

ETFs[4]. Although active manager costs have been declining (and the availability of institutional share classes to firms such as MCCA that can meet these shares' higher minimum investment requirements reduces active management fees) some investors have become increasingly fee sensitive. To accommodate both an expressed investor desire to achieve "better than market" (excess) returns while mitigating total investment costs, portfolios combining active managers with passive, index-matching ETFs can be constructed. The chart below again compares the distribution of 12-month excess returns,



illustrating outcomes for various active/index blends in comparison to a 100% active (4 manager) portfolio. As shown, adding index funds into the mix reduces tracking error, decreasing the possibility that returns fall well-short of the market, preserving some (20%-30%) possibility of delivering excess annual returns of +100 bp or greater, and reducing portfolio expenses by as much as 25-35%.

Mill Creek's Approach

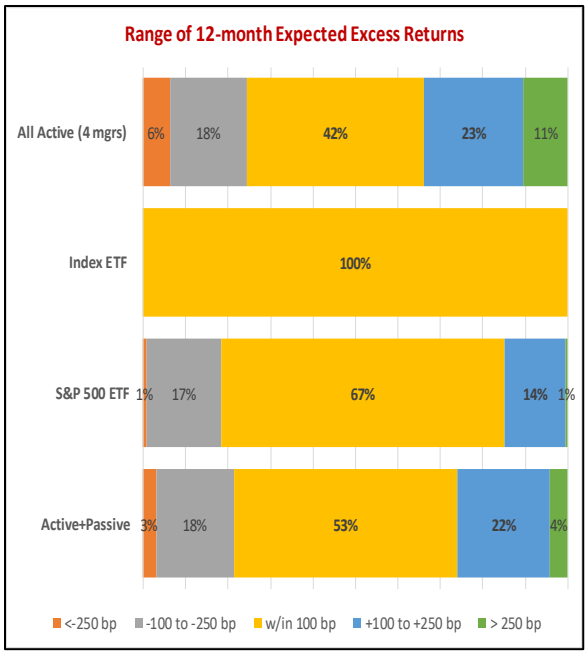
Our perspective is – and has long been – that a majority of investors can be equally well-served across time by owning an equity portfolio comprised of either a) 100% passive index funds or ETFs (themselves weighted differently within the portfolio to take modest risks relative to the broad market), or b) a mix of active managers and passive ETFs[5]. We believe that a minimum 60% allocation to active managers achieves a desirable balance of excess return potential and a low risk of experiencing "worst case" (relative returns of -250 bp or worse) outcomes. We also believe that dialing-up exposures to active managers (and, thereby, portfolio tracking error) makes sense in certain investment environments.

We also think that both approaches to portfolio construction are superior to a "Buy and Hold the S&P 500 Index" strategy. Though recent performance of the latter benchmark may have contributed to an investor mythology that such a strategy will achieve superior long-term returns, historical data refutes this belief. As is incorporated into the chart below, the S&P 500 Index has produced tracking error of approximately 105 basis points (versus the broader Russell 1000 benchmark) across a long-term investment horizon. Though not a substantial amount of relative risk (but also one that produced a -7 basis points annualized net return shortfall) this means that such an approach to investing will likely lag the market with nearly the same likelihood as an active/passive blended portfolio (18% chance

[4] This analysis assumes that each of the active managers produces long-term net excess returns of +75 basis points in comparison to a broad benchmark of large cap U.S. equities (Russell 1000 Index). Higher manager excess returns would skew potential portfolio outcomes more positively (i.e., produce a greater likelihood of positive excess returns); portfolio outcomes would skew more negatively if managers' excess returns are lower.

[5] A blend of active and passive strategies is better suited to institutional investors and to individual investor investments held within tax-sheltered or tax-deferred accounts because of the relative tax inefficiency of actively managed strategies.

vs. 21%) without offering as much potential for producing moderate to high excess returns:



Summary and Conclusions

Investors – and advisors to investors – have a choice as to *whether* they want to incorporate relative risks into their equity portfolios, and if so, *how much relative risk* can they tolerate across a short- to intermediate-term investment horizon. The selection of individual actively managed strategies to incorporate into a portfolio cannot take place in insolation. Allocating 100% of assets to just one or two "top performing" managers introduces a substantial amount of relative risk and manager risk into a portfolio. Though perhaps tolerable within certain segments of a broadly diversified global equity portfolio (i.e., small cap U.S. equities, which comprise just 8% and 4% of the U.S. and global equity markets, respectively), such risks are usually too great within a portfolio's U.S. large cap core. At the other extreme, diversifying assets across a large (8 or more) actively managed strategies substantially reduces both manager risks and relative risks – producing a portfolio that can produce healthy (+100 to +250 basis points) excess returns. But it does so at a relatively high cost. We think that investing in both active and index-matching strategies can accomplish the same range of (and bias toward positive) relative returns but at a 25-35% lower cost than an all-active approach to equity portfolio construction.

Investment Strategy Group
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Appendix: Research Methodology

The process used for the purposes of modeling how the number of active managers in an equity portfolio affect a portfolio's expected relative risks (tracking error) was as follows:

- We selected 12 actively managed mutual funds (6 value-oriented funds and 6 growth-oriented funds) that manage relatively concentrated portfolios and which have exhibited average to above-average historical tracking errors relative to an appropriate equity market benchmark (the Russell 1000 Value and Russell 1000 Growth indices, respectively). Individually, the managers used in the analysis had historical tracking errors ranging from 350-610 basis points relative to the Russell 1000 benchmark. Mill Creek has invested in some, but not all, of the managers used in this analysis.

- We constructed a series of equally weighted portfolios comprised of one or more growth and value managers. For example, the representative "Two Manager" portfolio had 50% of its assets allocated to a growth strategy and 50% of its assets to a value strategy. The representative "Eight Manager" portfolio had 12.5% of its assets allocated to each of 4 growth managers and 4 value managers.

- We analyzed the stock-by-stock exposures of each portfolio in comparison to the overall large cap U.S. stock market benchmark (the Russell 1000 Index) using Bloomberg's **Portfolio & Risk Analysis** functionality. This analytical model calculates, among other statistics, a portfolio's ex-ante (forecasted) tracking error across a 12-month period assuming no changes to the composition of the underlying portfolio or that of the reference market benchmark.

Disclosures

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