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PORTFOLIO MANAGEMENT

Tracking Error and Tactical Asset Allocation

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Abstract

We report results from our investigation of the relationship between statistical

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investment strategists, and risk managers. The reason is that these practitioners often think in terms of tracking volatility or correlation whereas the actual allocation decisions by portfolio managers tend to be guided by recommendations and constraints on the weights of assets or asset classes in their portfolios.

Typically, tracking errors are calculated either as second moments of return differentials between the tracking portfolio and some benchmark or as correlation coefficients. In practice, however, constraints on tactical deviations from benchmark weights are usually imposed on a portfolio manager to ensure adequate tracking and limit the active part of portfolio risk. These bounds define the maximum percentages by which the actual portfolio weights may deviate from the corresponding weights in the benchmark. For example, for an equally weighted benchmark portfolio consisting of five asset classes with strategic weights of 20 percent for each class, an active management contract might allow the portfolio manager to deviate from the weights within a range of ± 10 percent for each class. Such a range implies a certain tracking-error range, so the active manager has the chance to earn abnormal portfolio returns.

We took a simulation approach to quantifying the relationship between statistical tracking-error measures and constraints on weights: For given tactical asset allocation (TAA) ranges, we identified admissible tactical portfolio combinations and simulated for these portfolios return series based on historical data. We then calculated the

correlation between the tactical portfolio return series and the benchmark return series. We found that the tracking error is not only a function of the tactical asset allocation but also a function of the benchmark composition. We studied three tactical asset allocation strategies: static, dynamic, and dynamic with trend. We found that the tracking error is generally higher for dynamic strategies than for static strategies, and that the tracking error is generally higher for dynamic strategies with trends than for dynamic strategies without trends. We also found that the tracking error is generally higher for tactical portfolios with higher tactical asset allocation ranges than for tactical portfolios with lower tactical asset allocation ranges. We also found that the tracking error is generally higher for tactical portfolios with higher tactical asset allocation ranges than for tactical portfolios with lower tactical asset allocation ranges. We also found that the tracking error is generally higher for tactical portfolios with higher tactical asset allocation ranges than for tactical portfolios with lower tactical asset allocation ranges.

The asset allocation strategies we studied were based on return series for U.S. stocks and U.S. bonds. We applied the same asset allocation strategies to a benchmark portfolio consisting of U.S. stocks and U.S. bonds. We found that the tracking error is generally higher for tactical portfolios with higher tactical asset allocation ranges than for tactical portfolios with lower tactical asset allocation ranges. We also found that the tracking error is generally higher for tactical portfolios with higher tactical asset allocation ranges than for tactical portfolios with lower tactical asset allocation ranges. We also found that the tracking error is generally higher for tactical portfolios with higher tactical asset allocation ranges than for tactical portfolios with lower tactical asset allocation ranges.



For given tactical ranges, we found that the lowest attainable correlation coefficients between the tactical portfolios and the benchmark are surprisingly high. Consequently, imposing a lower bound for admissible correlation between tracking portfolio and benchmark may not prevent portfolio managers from holding portfolios that differ greatly from their benchmarks in terms of asset-class weights. We also found that tracking errors and correlation coefficients are very sensitive to the tracking accuracy of the individual asset classes. Thus, restrictions imposed to control the deviation of TAA strategies from benchmarks should not only restrict the weighting of the individual asset classes (i.e., the determination of tactical ranges), as is often done in practice, but should also control the error arising from the tracking of the individual asset classes.

We also applied our tracking-error analysis to the valuation of performance fees. Allowing for a higher tracking error increases the value of a performance fee contract to a portfolio manager because of the greater flexibility for the implementation of active strategies and thus the higher potential rewards. For given tactical ranges, we identified the highest corresponding tracking error in our simulation results and then used a pricing model for exchange options to compute the value of the performance fee contract. We found that the value of the contract is roughly proportional to the width of the tactical allocation ranges.



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