

Risk control in global alpha

As a lower expected return on traditional financial assets has prompted many institutional investors to seek returns from a more diversified range of investments, Mellon Capital Management Corporation (Mellon Capital) looks at the role of risk management in a portfolio and explains why a deeper understanding of risk and finer risk control are essential elements of the alpha generating process.

During the first half of the 1990s risk was viewed as a hypothetical abstraction with marginal relevance to the new economy. Today, the opposite is true. Geopolitical instability, corporate malfeasance, a bear market and slower economic growth have all contributed to a radical revaluation of risk factors. A lower expected return on traditional financial assets has prompted many institutional investors to seek returns from a more diversified range of investments. All the while, financial derivatives continue to offer greater opportunities to manage risk and increase capital efficiency. This combination has led to an increased reliance on active management, and in so doing has shifted the onus of understanding risk squarely on to the shoulders of plan sponsors and their consultants.

A deeper grasp of investment risk can help plan sponsors in two distinct ways; first, knowledge of the types of risks undertaken by investment managers can help determine how different strategies complement an overall strategic allocation. Second, a superior approach to risk

management can be a good indicator of investment skill. All else being equal, managers with finer risk control will tend to have higher information ratios for the same alpha targets.

At Mellon Capital, we are quantitative investment managers, and risk management has always been at the heart of our approach to building robust portfolios. For the bulk of the asset management industry, the main investments related to risk management have resulted in the emergence of a distinct

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risk management function. The role of the new risk manager is to analyse portfolio risks, recommend changes and ensure that portfolios are broadly in line with investment guidelines. As a result, the new risk management function has been concerned mainly with describing and measuring risk after the fact. At Mellon Capital, we believe that risk management is an integral part of the alpha generating process. This means that managing, controlling and mitigating risk starts before we build portfolios and is done in conjunction with signal construction. Many of the new risk models have evolved from the revolution in forecasting volatility that began in academics over two decades ago (Engle, 1982). Although there is now broad agreement that volatility is partly forecastable on a very high frequency basis, such as hourly or daily (Andersen & Bollerslev, 1997), much less is known about its forecastability over longer horizons. As investment managers we have a significantly longer horizon than hours or days, and our risk models must reflect our need to manage the ongoing risk of a live portfolio. By building our own risk management

framework, we attempt to match the frequency of our risk estimates with those of our signals. More importantly, a proprietary risk framework allows us to focus on the risks that are most relevant to our strategies.

The standard metric for expressing risk in the investment management industry is tracking error. A single metric will never fully capture the multi-faceted nature of risk. The main elements of risk not captured by active risk include credit, legal, operational and liquidity risk. Traditional security selection strategies tend to face varying degrees of these further risks. Trading emerging market currencies, for example, is often exposed to significant liquidity risk, as individual currency pairs tend to be thinly traded. The propensity for liquidity to dry up at times of crisis when it is most needed makes it particularly pernicious. In order to minimise liquidity risk in our global alpha strategies, we only invest in the most developed stock, bond and currency markets in the world.

The first step in managing risk in global alpha portfolios begins before we even consider what risk model to use. In the same way that individual security risk (idiosyncratic risk) can be diversified away by holding a basket of securities, combining multiple uncorrelated alpha sources reduces the overall active risk of a given strategy. At Mellon Capital our global alpha portfolios combine four distinct alpha sources that seek to exploit market inefficiencies that occur within the industrialised countries' stock, bond and currency markets and between global stock and bond markets. Each opportunity set is independent, and combining them helps to reduce the overall variability of the alpha stream for the same return target.

A further risk management benefit from combining multiple alpha sources is afforded by the possibility for dynamic risk budgeting between the various alpha sleeves. Currently we expect that over a meaningful



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Mellon Global Investments

Mellon Global Investments distributes the capabilities of Mellon Capital to global (ex USA) clients. For further information on Mellon Capital's global alpha strategy or any other strategy offered by Mellon's boutique asset managers please contact the Mellon Institutional Client Service team on +44 20 7163 2594.

Mellon Capital, one of Mellon's specialist asset management boutiques, based in San Francisco, USA, has a tradition of bringing innovation to investment management that spans over 30 years and the firm focuses on investment solutions designed to meet the needs of institutional investors.

Long recognised as pioneers in applying modern portfolio and capital market theory to the investment process, Mellon Capital's research department has kept the firm on the cutting edge of investment management, continually striving to enhance current products and develop new strategies.

investment horizon the stock versus bond sleeve will consume approximately 10% of the total active risk budget, while the three other sleeves are equally budgeted to consume the remaining 90%. This long-run calibration reflects our beliefs about the relative strengths of the underlying signals. Month to month, however, as changes in prices, cash flows and preferences combine to shift relative valuations, the opportunities to add value within our four alpha sources also change. By allowing a short-term dynamic shift in the risk budget, we are able to capture the change in relative opportunities as they occur.

Along with each of the four components, dynamic risk budgeting also functions at the total-risk level. In the same way that opportunities shift between the different alpha components, the overall opportunity set also varies. Allowing the total risk budget to vary within reasonable bounds ensures that, month-by-month, our total portfolio is proportionally scaled to the overall opportunity set. Having combined multiple alpha sources within a dynamic risk budgeting framework, the next step in building a portfolio consists of determining the optimal risk-return trade-off between the expected return of each asset and its individual contribution to total portfolio risk.

At the heart of the Mellon Capital global alpha strategy is a proprietary risk model that manages the active risk of the portfolio simultaneously along four distinct risk dimensions. The first dimension of the model is based on the correlations and variances of the various asset classes. When coupled with expected returns in an optimisation, the correlation and variance estimates determine how additional return is traded off versus additional risk when constructing the portfolio. The risk estimate produced by this process, however, is only the beginning of the story. Indeed, if all the inputs were known with the same confidence and returns were truly normal,

the risk management problem would be reduced to a simple optimisation exercise. Because these assumptions do not hold in practice, our risk models reach beyond this single dimension. The second risk dimension focuses on correlation estimates, which tend to shift portfolios toward large long-short positions in highly correlated assets. Consider a hypothetical emerging market currency that moves in lockstep with the US Dollar 90% of the time. Although the best point estimate of average correlation is 0.9, a small yield differential between the two currencies will lead to large long-short positions between US Dollars and the emerging market currency. From an investment perspective the true risk of the portfolio is high, since 10% of the time when the correlation breaks down, the portfolio can be exposed to large and sudden drawdowns. This additional risk is sometimes referred to as “earthquake risk”. We account for this problem by applying carefully designed bloc penalties that reduce investments in highly correlated assets. The third dimension of risk tackled by the model deals with risk concentration. A portfolio with one large long investment financed by many shorts is significantly riskier than a portfolio that has distributed its risk budget more evenly across the opportunity set. Mellon Capital's risk model is designed to identify highly concentrated positions and to rebuild the portfolio by ensuring that the risk budget is allocated in a consistent manner that no single investment exposure dominates the expected risk of the portfolio.

The fourth and final dimension of the risk model is, appropriately enough, the most abstract and subtle. Strictly speaking, this last piece deals with the estimation error associated with all of the inputs and could well be called the humility dimension. We recognise that all models, financial or otherwise, are simplifications of an underlying process and hence by definition cannot encompass all available information. We also understand that asset return distributions have substantially fatter tails

than do normal distributions and that the chance of an extreme price movement is higher than standard statistical models would indicate. In order to account for this additional uncertainty, our risk model mitigates the responsiveness of the portfolio to extreme signals. In this way we attempt to avoid the “value trap” where, for example, an already undervalued asset continues to get cheaper and cheaper. Rather than follow the signal blindly, our portfolios will tend to slow down how much of the asset we continue to accumulate. Controlling this final dimension of risk ensures that we minimise the estimation error of the inputs in a consistent manner that reduces both turnover and active risk.

At Mellon Capital we understand that a risk budget is a scarce resource that needs to be spent wisely in order to provide the highest-quality alpha. Our risk management process ensures that effective risk control and budgeting are core building blocks for every one of our portfolios. Our focus on managing active risk has enabled us to deliver alpha with a lower active risk.

References:

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Engle, R F (1982), “Autoregressive Conditional Heteroskedasticity with Estimates of the Variance of United Kingdom Inflation,” *Econometrica* 50.



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