Thirteen Questions Risk Models Can Answer for Asset Managers and Their Clients

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Over the years, it has become very clear to us at Northfield that many of our clients use the risk assessment systems in the bare minimum way of simply producing a routine risk decomposition report for a portfolio on some periodic basis. However, the risk models and related software that we provide can be used to enhance the effectiveness of the entire investment process from investment policy to trading, in ways that are not available without formal risk assessment.

Below is a list of issues for which asset managers should take advantage of their risk systems. The list is in no particular order. Each of the issues has been covered in more detail in previous Northfield newsletters, research papers or conference presentations, the majority of which is on our website. Clients are encouraged to speak with their Northfield sales representative or our technical support staff for more information on topics of specific interest to them.

1. Some long term investors argue that they don't need to worry about risk because they do not intend to make any withdrawals from their portfolio for a very long time. *This is clearly an irrational view.* It is mathematically demonstrable that volatility in portfolio returns reduces the contribution of the compounding of returns to long term wealth accumulation. Assuming returns are approximately normally distributed, the average geometric rate of return will be equal to the average arithmetic rate of return, minus the variance of the returns. Can you demonstrate that the loss of compounding due to volatility of returns for your portfolios is more than offset by the expected value of incremental returns above the risk free rate or benchmark?

2. When engaging active managers, investors measure active management returns relative to some benchmark index. They also use the benchmark index as a proxy for participation in an asset class or portfolio style in making asset allocation decisions. Can you demonstrate that your actively managed portfolio is not so different from the benchmark index that the validity of the investor's asset allocation decision has been compromised? Can you also demonstrate that your portfolio is not so similar to the benchmark index that active management has little chance of producing net returns to the investors after active management fees?

3. While managers are typically measured by benchmark relative returns, investors cannot pay their financial obligations with "benchmark relative money." Investors therefore have concerns both about absolute risk and benchmark relative risk. Institutional investors that expect to have nearly infinite lives tend to put a lot of emphasis on benchmark relative returns as a proxy for maintaining long-term purchasing power. Private clients tend to put a lot more emphasis on absolute risks and returns. What is the relative importance of these two concerns to a specific investor, and how is that preference observable in the composition of the portfolio? Put in another way, do we know what our portfolios imply about how risk averse our investors are to these two different aspects of risk? If we have an explicit understanding of these issues, we can neatly encapsulate the problem by mixing cash into our benchmark index to represent the proportional degree of concern for absolute risk and return.

4. As active managers, we employ strategies that incorporate our skills in "security selection" and also in making sector/country/style decisions. To the extent we wish to outperform benchmarks via a particular source of skill, we must accept uncertainty in that aspect of portfolio returns in order to have an opportunity set. Institutional investors rightly place on an asset manager being "true to their style" and assume that successful performance is accidental if it arises from an investment process inconsistent with

the manager's investment thesis. Does the risk decomposition of our portfolio appropriately reflect our expected sources of superior performance?

5. Volatility of benchmark relative returns arises from two sources. The first is "tracking error" which arises from the random influence of changing market conditions and firm specific events. The second source of volatility is strategy risk, which is the extent to which the effectiveness of our strategies varies over time. For example, if a star research analyst resigned, the potential negative impact on our portfolios would be a form of strategy risk, not tracking error. Have we been able to analyze our past performance track record with respect to the degree of strategy risk, and formulate internal management policy accordingly?

6. For a portfolio to represent the best balance of expected returns and risks at the portfolio level, the weight of each security position must balance expected returns and expected risks at the margin. As such, it is possible to infer the expected returns on securities from the composition of a portfolio. This process is often referred to as "reverse optimization." To the extent we obtain these implied expected returns, are they consistent with our actual beliefs about the expected returns from different securities? This information can also be a key to ensuring quality control across a set of heterogeneous client portfolios. Are the implied expected returns consistent across the many portfolios under management (if we believe that IBM will outperform Microsoft in one portfolio, we must believe that for all portfolios!)?

7. The sensitivity of a portfolio's return to the returns to the returns of a given sector (or country) involves both the weight of the portfolio allocated to that sector (country) and the extent to which the specific firms held in the portfolio are more or less sensitive to business conditions in that sector (country). How does your risk management process differentiate between the value weights allocated to a sector (country) and the economic exposure of your portfolio to the influence of that sector (country)?

8. Macroeconomic relations to security returns are often unintuitive. For example, we might believe that oil companies benefit from high oil prices, while airlines suffer greatly. However statistical tests have demonstrated that certain industries such as "chain retail" are even more sensitive to energy costs than airlines (consumer spending declines, consumer avoid driving to dispersed locations, shipping costs, HVAC costs, etc.). How does your risk management process alert you to broad macroeconomic exposures in your portfolio that may not be intuitively obvious?

9. Regulations in many European countries (e.g. UCITS 3) now require that most mutual funds sold across national borders have a standing risk management process that includes a periodic calculation of a 10 day Value-At-Risk, and the reporting of those results to boards of directors and in some cases regulators. Current regulatory discussions are likely to extend this requirement to separately managed accounts in many countries, even for investors with long term investment horizons. Does your risk management process support the necessary reporting?

10. Large asset management organizations typically manage many portfolios with heterogeneous goals and requirements. Let us assume we decide that a particular stock is a "buy" and want to purchase 300,000 shares of stock X in aggregate for our portfolios, but market liquidity limits us to 30,000 per day of buying. How do we decide in which portfolios this purchase has the most benefit, and is therefore the most urgent? Many investment firms simply dump this problem on their traders to work out in an ad hoc fashion or limit the size of aggregate purchases to quantities that are more easily obtained, both of which are obviously sub-optimal solutions.

11. Investment consultants often use the dispersion between returns of similar portfolios as evidence of poor quality control on the part of an asset manager. On the other hand, the differences in client goals, constraints and preferences should produce different portfolios for different clients and therefore different

returns. Can you estimate the expected level of dispersion amongst the entire range of managed portfolios, and thereby demonstrate that the observed dispersion arises from differences in client need, rather than sloppy management?

12. To the extent that capital gain taxes reduce the range of possible return outcomes to the investor, the balance of portfolio return and risk is quite different when taxes are considered. How are the risk profiles of your portfolios differentiated between institutional clients that are not subject to capital gain taxes and private clients that normally are subject to capital gain tax? Similarly, for mutual funds that have both taxable individual shareholders and tax deferred shareholders (e.g. 401K plans), how has the influence of taxation on risk tolerance been rationalized?

13. The efficiency of equity trading can often be greatly improved by better communication between portfolio managers and traders with regard to which trades are urgent (and hence must be completed quickly) and which can be completed more slowly in order to minimize market impact. One way to analyze this problem is to consider the set of undone trades as a long short portfolio that you are trying to liquidate. You are "long" stocks that you do have and don't want, and "short" stocks you do want but don't have. A standard risk decomposition report on this "long/short" portfolio can clearly point out which positions have the greatest contribution to portfolio risk and hence are the most urgent to complete.