

# Global Investment Risk Management

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The subjects of global investment risk analysis and management are currently gaining serious attention from pension plan sponsors, investment portfolio managers and the consultants who advise on investment policy and strategy. Each of these interested parties has a number of reasons for their involvement in investment risk management, particularly in a global context.

Plan sponsors wish to ensure that their appointed investment managers faithfully execute the investment mandate given to them in a manner consistent with an agreed written investment policy statement. They need to be aware of the nature of the investment risks contemplated as acceptable within the constraints of the investment mandate and they need to have timely and relevant information to monitor the investment risks associated with a fund's particular investments so as to be able to exercise prudent oversight of the funding and investment processes.

Investment portfolio managers will similarly wish to see that the investment strategies that they implement do not incur the risk of significantly deviating from or contravening the investment mandate and policy guidelines. If investment performance is to be monitored and evaluated against a benchmark for a specific asset class or a composite benchmark for several asset classes, the investment portfolio manager will need to constantly monitor the active risk assumed by following a strategy and constructing a portfolio that differs in any way from the designated benchmark.

Consultants will effectively be responsible for creating the funding and investment strategies and for coordinating their implementation and ongoing management through communication with the plan sponsor and the investment portfolio managers. In this context, investment risk is only one of several risk exposures involved in the interplay of a pension fund's assets and liabilities. However, investment risk differs from other economic and demographic factors, such as inflation, productivity, staff turnover, mortality and retirement rates, because investment risk is much more capable of being managed and controlled. Accordingly, investment return and its associated risk features are of paramount importance to consultants.

## BACKGROUND

In the recently published book by economist Peter Bernstein entitled *Against the Gods – The Remarkable Story of Risk*, the author tells a fascinating story of man's attempts throughout history to come to terms with various aspects of risk. Bernstein details the study of various games and gambling risks by mathematicians in the 16th and 17th centuries. He also recounts the early development of mortality studies, insurance practices and the sale of annuities. From these beginnings, Bernstein moves on through the development of modern portfolio theory and the creation of derivatives and their uses to a full discussion of investment risk, including the early work of Harry Markowitz.

Bernstein's book is not only a remarkable compendium of the contributions of the great mathematicians, economists, statisticians and philosophers towards the study of risk; it has also served as *de rigueur* reading in the investment community and has provided both a platform and a focus for informed discussions on various aspects of investment risk among plan sponsors, investment portfolio managers and consultants.

Over the last 20 or so years, there has been a great deal of progress made in the development of investment risk analysis. Some of the recent contributions can be traced back to the pioneering work of Barr Rosenberg in the 1970's at the University of California, Berkeley. Rosenberg identified the concept of risk factors and developed the earliest risk factor models, involving the decomposition of security returns into common and specific sources of return. The technical aspect of his work concentrated on the sources

of co-movement in securities returns, resulting in a covariance matrix of risk factor returns. He developed multi-factor risk models that provide a framework for risk measurement, portfolio construction and performance attribution analysis.

### **CURRENT SITUATION**

Investment risk is a topic of concern in many situations that are currently attracting the attention of not only the professional investment community but also the individual participants whose pensions and savings accounts are at risk. The practical impact of investment risk management systems has become apparent as various recent problems have emerged that could have been mitigated with specific controls on investment risk.

The United States and Canada have in recent years experienced some notable failures of life insurance companies, variously attributed to high-yield (junk) bond exposure and over-concentration in mortgages. The misuse of derivatives has produced immense investment losses to a county in California, to highly regarded companies in Germany and the United States and to a British financial institution with a long and illustrious history.

The *Financial Times* published a pension fund investment survey in May this year. This survey consisted of a set of 19 different articles addressing various aspects of pension fund investment. The survey was notable for its informed and objective commentary on investment managers, investment performance, benchmarks, funding, derivatives, emerging markets, alternative investments, passive management, tactical asset allocation and other topics. Underlying each of these topics was a common theme of investment risk considerations.

Some of the major points that were highlights of the *Financial Times* survey are worth noting:

- Most consultants are now promoting the idea of the multi-manager specialist structures rather than the traditional use of the one discretionary balanced manager.
- US investment managers tend to use more complex, process-driven investment techniques in which risks are controlled more precisely against sectors, stock size categories and other factors.
- UK managers have recently badly misjudged the relative attractions of the US and Asian stock markets.
- A UK investment performance monitoring service reported that the overseas equity return of UK pension funds lagged the World ex UK index return of 19% by a full 12.9 percentage points in 1997. Another monitoring service reported a similar underperformance of more than 11 percentage points for the pension funds in its universe.
- Successful global investment managers utilized strategies more closely linked to capitalization weights.
- Underperforming managers typically relied on top-down strategies and value-based methods.

- Some fund managers tended to control their risks against the median fund's strategy rather than against the global indices.
- The growth of specialist mandates in the UK and Continental Europe, where fund-specific benchmarks are set, requires increased monitoring of performance and risk relative to the benchmarks.

A particular type of investment risk of current concern to funds that are managed with a global mandate is the currency risk associated with holding foreign securities. If assets and liabilities are expressed in different currencies and the currencies move against each other over time due to floating exchange rates or, in extreme situations, due to currency devaluations, a significant risk of loss may be realized unless a specific hedging strategy is employed to mitigate the risk. The hedging strategy will, by its nature, incur a cost which in effect reduces the realized rate of investment return earned by the fund.

### **RISK ANALYSIS**

A basic purpose of risk analysis is to identify where risks exist and to develop information and analysis according to the sources of risk. It might be argued that any specific investment strategy involves an element of risk relative to a designated standard benchmark. Any deviation in active strategy from a passive benchmark results in active return and active risk. This will be true of strategies derived from top-down economic scenarios, from the adoption of specific equity selection styles such as "growth" or "value," and from any specialized investment focus on particular sectors or strategies linked to capitalization weightings by countries, industries, or any other screening and selection criteria.

In considering active risk and return, it is important to be specific about investment objectives as typically set forth in the written description of the investment mandate. The investment objectives will logically suggest the choice of an appropriate benchmark against which the emerging performance may be measured, the active risk and return monitored, and the value-added by the active strategy quantified as a specific measure of risk and return.

It is now customary practice for plan sponsors, investment portfolio managers and consultants to analyze investment performance relative to a benchmark. The difference in returns between the portfolio and the benchmark, representing the active return, is the focus of risk analysis where the corresponding volatility of the active return, as measured by its standard deviation, is termed "active risk." Active risk analysis then proceeds to an exhaustive process of decomposition to identify its various sources.

### **RISK MODELS**

Multiple factor risk models are formal statements about the relationships between security returns in an investment portfolio. The basic premise is that securities with similar characteristics should generate similar rates of investment return. The concept of similarity is more formally defined in terms of a series of descriptors, ratios and asset attributes based on market information such as price and volume, or on fundamental data derived from a company's balance sheet and income statement.

There are, in practice, three alternative approaches to constructing a risk factor model of investment returns. A fundamental approach begins with data on a company's fundamental characteristics, such as industry exposure or debt-to-equity leverage, and estimates security sensitivities to each factor associated with those characteristics. A macroeconomic approach utilizes variables, such as growth rates in gross national product or excess inflation, as the requisite factors and estimates the sensitivities of securities to these factors. A third approach is a purely statistical method that utilizes a covariance matrix of realized returns to provide estimates of security sensitivities to various risk factors.

There are a number of specialized software vendors with products that utilize multiple factor models as the basis for investment risk analysis. Typical models use risk index factors and industry factors. Examples of typical risk indices are volatility, momentum, growth, earnings yield, value, size, leverage, dividend yield and currency sensitivity. Industry factors relate to both economic sectors and specific industries; the models can readily handle multi-industry allocations for conglomerate companies.

### **RISK MANAGEMENT**

The approach to global investment risk management consists of a system of risk analysis and monitoring, which provides the plan sponsor, investment portfolio manager and consultant with a rigorous, disciplined quantitative analysis of international portfolios within or across markets and asset classes. The system provides risk analysis, portfolio construction optimization, and investment performance analysis and attribution.

The risk analysis feature determines the risk of global asset allocation strategies relative to appropriate global benchmarks. The analysis reveals the effect various asset classes have on a portfolio's risk and return. It measures the efficiency of the portfolio and shows how asset weighting can be adjusted to make the portfolio more efficient.

The portfolio construction optimizer creates a range of portfolios based on expectations and specific optimization parameters, permitting the selection from different asset allocation strategies and risk levels along an efficient frontier.

The performance analysis feature attributes historical risk and return to their sources, separating currency effects from local market effects, and identifying the contribution to return from each of the specified risk factors.

The risk management system incorporates all major asset classes including equities, bonds, currencies, commodities and real estate. It also incorporates an extensive database of securities for all the world's major markets.

### **PRACTICAL APPLICATIONS**

With information provided by a global investment risk management system, the plan sponsor, investment portfolio manager and consultant are all enabled to perform their respective tasks more efficiently. The ongoing application of the system will provide greater insights into the nature of investment risk and the operation of the investment management process.

In practical terms, the global investment risk management system helps to ensure that the intentions of the investment mandate are faithfully executed, that the risk of underperformance due to active investment strategy is clearly identified, and that asset class and country allocation strategies are closely monitored with quantified measures of the associated risks. This kind of global investment risk management system has numerous practical applications and potential benefits, for example:

- the study and analysis of total and active risk relative to any relevant index or customized benchmark;
- the measurement of the impact of portfolio changes from a local market and currency risk perspective;
- the identification of assets that add the most (or least) to portfolio diversification and risk reduction;
- the hedging of portfolio currency risk and construction of hedged benchmarks;
- the analysis and attribution of total and active investment performance over an extended time period or rolling periods of uniform duration;
- the calculation and monitoring of portfolio value at risk;
- the evaluation and analysis of complex investment portfolio structures including long and short positions or simulated asset class allocations; and
- the customization of the covariance matrix generator to incorporate individual assessments and assumptions.

The ready availability of powerful software for investment risk analysis and control brings a useful supplement to the knowledge and skill sets of the plan sponsor, investment portfolio manager and consultant; it empowers them with advanced risk management techniques and promises to make the investment management process more efficient in the future as its application becomes more widely adopted.

### **CHALLENGES AHEAD**

The introduction of powerful new techniques for investment risk analysis and management represents a major challenge for plan sponsors, investment portfolio managers and consultants in their future approach to pension fund investment strategy. Closer coordination of the respective roles of these three interested parties will be the hallmark of global investment management in future years.

For their part, plan sponsors will need to gain an understanding of the nature of investment risk and learn certain aspects of the technical methodology of investment risk measurement and analysis. They will be required to play a significantly more proactive role in monitoring investment activity and in communicating with investment portfolio managers and consultants. They will need to set standards and guidelines incorporating risk management controls and hold investment portfolio managers accountable for adhering to the standards and guidelines. They will need to provide objective criticism and feedback on a regular basis rather than being the passive receptors of periodic reports from the investment portfolio managers and consultants.

They will need to explore and understand how asset allocation strategies utilizing multi-manager specialist mandates will affect a fund's investment risk profile. They will need to be prepared to actively participate in directing the ongoing asset allocation process. They will participate with the investment portfolio managers and consultants in the processes that result in the specification of acceptable risk levels and the construction of investment portfolios across markets, asset classes and investment styles. They will increasingly focus on establishing performance goals relative to benchmarks in addition to monitoring investment performance of managers relative to a peer group. They will specify meaningful periods of measurement for investment performance including the use of sequential rolling-periods of constant duration. Finally, they will become proficient in interpreting investment performance attribution analysis and understand the important role of risk factor models in helping to produce efficient risk management as a part of the investment process.

The overriding consideration for investment portfolio managers in the years ahead will be the need to incorporate risk assessment and analysis into investment strategies. They will need to develop more quantitative approaches versus purely subjective and intuitive approaches to investment portfolio management strategies. They will need to differentiate between sources of risk, distinguishing between market risk and other sources of risk. Correspondingly they will be required to provide very detailed commentary and explanations of investment performance attribution analysis. Rather than carrying out their investment mandates in isolation, they will more actively communicate, cooperate and coordinate with consultants and plan sponsors. They will become more open and recognize the proactive roles of the other interested parties. In practical terms, they will need to be prepared to modify investment strategies and portfolio construction to reflect input and feedback from the plan sponsors and consultants. They will need to become more closely attuned to the demands of active risk management processes and become sensitive to the potential business risk of losing existing relationships or not winning new relationships as

their competitors gain an advantage through the successful implementation of investment risk strategies.

The challenge to consultants who are not specialists in investment risk analysis and management will be the need to move up the learning curve and achieve the technical ability to apply the new investment risk analysis methodology in practice. They will need to upgrade manager search projects and investment performance analysis to new levels of sophistication. They will need to extend manager style analysis to include a risk profile and determine how a new or replacement investment manager will impact the total risk picture of a particular fund. They will need to provide more rigorous investment performance attribution analysis reports as an essential component of client communication. Consultants who undertake investment manager search projects based on a short-list of established favorite managers or based primarily on prior investment performance results are likely to find their recommendations not acceptable in the absence of a rigorous risk analysis to support their conclusions. Consultants who utilize the powerful software tools now available will establish themselves with a competitive advantage in the field of investment risk analysis and management.

## CONCLUSION

Pension plan sponsors and their consultants will, in the future, demand a greater degree of accountability from investment portfolio managers in the areas of investment risk and investment performance. Not only will rates of investment return be presented along with a peer group ranking, but deviations from an agreed benchmark will be an essential part of performance numbers along with detailed explanations of the sources of active return and active risk.

Once plan sponsors and their consultants become empowered with this information and investment portfolio managers are held accountable for performance and risk management, it is likely that the new insight will result in improved communication between the parties and produce more efficient execution of investment mandates with due recognition of investment risk. Ω