MANAGING VOLATILITY: A STRATEGIC FRAMEWORK

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IN BRIEF

• The investment environment has been characterized by periodic and sometimes severe crises in the past 15 years.

• The lessons learned from the crises include: Tail risk matters and volatility management needs to be embedded in the process and not approached as an overlay or a periodic check.

• A number of tools are available to investors to manage volatility at both the policy level and the strategy level. These tools are discussed and a framework for evaluating which of these tools may be appropriate is suggested.

• We recommend that institutional investors educate themselves on the available array of policies and tools to manage volatility, regardless of the specific measures they decide to adopt based on their objectives, their liability profile and the current investment environment.

The financial crisis of 2008 – 2009 marked a significant turning point for institutional investors with regard to their level of tolerance for investment volatility. Institutional investors of all types were impacted by the drop in asset prices and protracted volatility, as well as the resulting regulatory response. Plan sponsors as well as endowments and foundations, alongside other pools of capital like insurance companies, began to take increased note of investment approaches that explicitly seek to manage volatility.

Corporate plan sponsors were among those most affected; they felt the full earnings impact of the heightened volatility as it fed into quarterly financial statements and, in some cases, triggered employee notification rules. Individuals with defined contribution (DC) investments were also hard hit by the market declines. Many had misunderstood the equity market risks inherent in target date funds that have
increasingly become the default choice for DC plans. Similarly, companies with large pools of capital, such as insurance companies and health care organizations, that may have funds set aside for capital expansion projects, etc., have felt the implications of the market volatility because of more stringent capital requirements and less liquidity in the markets.

The magnitude of the 2008 – 2009 financial crisis and its ongoing economic effects have left an indelible imprint on the minds of investors. A number of lessons have been learned. Two important ones are, first, that tail risk matters and, second, that risk management needs to be embedded into one’s approach to managing assets, not appended after the fact.

Risk management in the spotlight

The approach to risk management prior to the 2008 crisis centered largely around the capital asset pricing model (CAPM) and probabilistic measures such as value-at-risk (VAR), led by Wall Street “quants” who championed these statistical methods. These models, by their nature, tend to highlight high-probability outcomes and minimize tail risk. When an event is categorized as having, say, a 2% probability of happening, it is human nature to largely dismiss the risk. The pitfalls in these models were apparent before the most recent financial crisis, most notably when Long Term Capital Management (LTCM) collapsed in 1998 after the Russian debt crisis. LTCM was founded by veteran Wall Street bond traders and two Nobel laureates, Myron Scholes and Robert Merton, who earned their accolades by devising a new method to value derivatives. In hindsight, it seems the mathematical nature and nomenclature of these risk models created a much greater illusion of certainty than the reality revealed was in fact warranted.

The observation that “low probability” events happen not infrequently has led to the realization that risk management techniques need to become much more embedded in the investment process. That observation has also spawned the view that scenario analysis needs to supplant or at least supplement probabilistic risk models. In effect, this means taking account of all the potential outcomes, including tail events, not just those deemed most likely. There is also a sense that the world could remain in the current deleveraging mode for quite some time and that this will inevitably lead to further dislocation and market volatility.

It is in this context that investors are anticipating an ongoing level of volatility and electing to actively manage it. An important evolution is emerging, one with two main characteristics: First, investors are adopting a broad array of risk management tools, policies and strategies to manage volatility and second, there is a recognition of the need to focus on both the liability and the asset sides of the equation, rather than just investment returns, to obtain a complete view of the investment challenge.

Investor objectives

Investors need to consider a variety of factors in their risk management plans, based on their type of plan and on other considerations such as their governance model. The governance of a pool of assets is a key factor in the way risk management decisions are made and implemented. If we take a corporate pension plan, for example, the plan is usually the responsibility of the board of directors or another appointed fiduciary, which typically appoints an investment committee and delegates the day-to-day fiduciary responsibilities to it. The plan’s size, the investment expertise of in-house personnel, the complexity of the investments, the financial circumstances of the pension plan and the industry it is operating in will all be factors in how the pension plan is managed.

Exhibit 1 presents an outline of some of the key investment objectives and portfolio management considerations for various types of institutional investors looking to manage asset volatility.

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<th>Exhibit 1: Investor objectives and considerations</th>
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<td>• Minimize pension expense/funded status volatility</td>
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<td>• Planned cash contribution strategy</td>
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<td>• Enhance investment returns</td>
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<td>• Evolve investment strategy as investment objectives change</td>
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<td>• Mitigate tail risk</td>
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Implementing volatility management

There are various ways of implementing volatility management, and individual plan or fund considerations will play an important role in the policies adopted and their implementation. We have chosen to differentiate the policy level decisions from the implementation stage, which typically involves the use of investment strategies. At the policy level, we have divided the various ways of approaching volatility management into strategic and dynamic policies. At the strategy level, we have grouped the strategies into four categories, or implementation options: indexed and managed tracking error, fundamental, liability-driven investing (LDI) and managed volatility.

Exhibit 2 provides a list of some of the main policies that can be adopted by investment trustees to provide the broad architecture to manage volatility.

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Strategic policy approaches

Strategic asset allocation

Institutional investors usually have a long-term strategic asset mix policy that is formally revisited every three years or so. In the past, this seldom changed, as investment horizons for DB pension plans, for example, were very long-term-oriented and various asset and liability smoothing mechanisms were available to help mitigate volatility. Asset forecasts, based primarily on long-term historical data series, traditionally formed the basis for asset diversification efforts. However, with changes in accounting regulations, freezing of DB plans to new entrants and increased market volatility, this is now less the case, and many institutional investors have been modifying their approaches to include medium-term asset forecasts and a wider array of diversifying asset classes in an effort to manage volatility and exploit investment opportunities.

Economic regime and scenario analysis

As mentioned, probabilistic risk management techniques are increasingly being supplemented by scenario analysis, which examines outcomes under numerous specific scenarios. For instance, what actually happens if interest rates remain as low as 1% or 2% over the next five years along with a market decline of 20%, and so forth? This kind of scenario analysis is very helpful in coming up with a dollar impact on the company’s P&L or balance sheet. It also allows for better worst-case planning, as very specific outcomes can be examined in detail. In general, scenario analysis allows one to observe short-term outcomes well, whereas probabilistic analysis is better suited to predicting a range of long-term outcomes, and the use of both approaches could be useful to investors.

Risk parity

Risk parity is a unique approach to risk management in that it asserts that the magnitude of risk from different asset classes should be roughly equivalent. This means, for example, that the risk associated with the equity portfolio should equal that of the bond portfolio. Given the lower risk profile of bonds, risk parity can be achieved only with a reduction in equity allocations and a significant increase in bond allocations. Lower equity allocations usually lead to significantly lower returns, which is an issue given the underfunded status of so many pension funds.

One way the lower return profile of the risk parity approach can be mitigated is with the use of leverage. The use of leverage can increase the effective bond allocation to the point at which the bond risk equals the equity risk. Some would argue this is good leverage because of the use of futures with collateral invested in safe Treasury instruments rather than the borrowing of capital. However, at the end of the day, it is leverage, which has its own set of issues and risks. This approach can be useful in limiting the exposure in the portfolio to the risks of any single asset class.

Risk factor analysis

Risk factor exposure is an adjunct to the traditional mean-variance approach. It examines the underlying risk factors that affect an asset class. The 2008 – 2009 financial crisis brought to the forefront the realization that traditional asset classifications such as equities and fixed income may not provide sufficient diversification because there are risk factors that are common to both asset classes.
Risk factors have been associated with asset classes in the same way that nutrients are associated with whole food. One can choose to focus on the nutrient level (e.g., protein, fats and carbohydrates) and select from the nutrients in a range of foodstuffs, or one can choose to focus on the whole food level (e.g., hamburgers, fries and salad) with the understanding that different foods can contain similar nutrients. Similarly, knowing what the risk factors are is very helpful in understanding how a portfolio behaves in different economic and market environments. Examples of risk factors in the capital markets world include interest rates, liquidity, currency, etc.

The addition of risk factor analysis can provide plan sponsors with an additional lens to use in conjunction with traditional asset allocation techniques to help ensure that proper diversification is being achieved in their portfolios.

**Outsourced CIO**

One of the most significant trends in the institutional marketplace, particularly in mature pension markets such as the UK and the US, is the advent of the outsourced CIO (OCIO), also known as delegated consulting, fiduciary management and implemented consulting. Essentially, this model involves the delegation of some or all of the day-to-day investment responsibilities normally handled by a plan sponsor’s investment committee and/or staff to an external provider, typically an investment manager or an investment consultant. Some of the advantages of this approach can include expert, objective decision-making (such as manager selection and termination), the ability to make more dynamic or tactical decisions (such as exploiting short-term investment opportunities), the implementation of changes in a timely manner (such as rebalancing and transition management, and better monitoring).

Plan sponsors should be careful in selecting an appropriate provider, as there are vast differences in the capabilities of the providers, though the services described may seem virtually identical. For example, certain providers may offer proprietary, multimanager funds, whereas others may only use bespoke funds. The pros and cons of choosing a given provider are far too numerous to list here, but some of the aspects that should be examined include the following: depth in capital markets and strategic research, manager research and performance record, fee models and economies of scale and operational and systems capabilities. Indeed, there are consultants that now specialize in evaluating OCIO providers for plan sponsors.

**Dynamic policy approaches**

Dynamic policy approaches cut across asset classes and have a short- to medium-term orientation. These approaches, unlike the more strategic long-term asset allocation approaches, involve a level of nimbleness and flexibility that can help mitigate volatility and enhance potential return outcomes.

**Opportunistic asset allocation**

One option for plan sponsors to both potentially increase returns and manage volatility is to allocate say, 10% to 15% of the portfolio to opportunistic investments. Certain sectors, sub-asset classes or niche investment opportunities may present an attractive short- or medium-term opportunity for the nimble and informed investor. An example of this is the opportunity that arose in the credit markets when the markets began to recover in 2009 and 2010. While investments such as these likely fall into the return-enhancing category, they can conversely help avoid the short- to medium-term risks associated with overvalued asset classes or economically sensitive investments.

Institutional investors in particular may be well-suited to use such an approach for at least a portion of their portfolio since they generally possess or have access to expert investment resources.

**Dynamic de-risking**

Dynamic de-risking is becoming an increasingly popular way of approaching volatility management for DB pension plans, as it actively takes into account funding levels and de-risks as they rise. It involves the following steps:

- A long-term funding target is established.
- The time horizon and risk appetite are specified.
- Based on this, the provider establishes the expected funding path and recommends a series of funding level bands crossed by this trajectory.
- Each band has an associated target growth portfolio allocation and a fixed-income portfolio that is typically hedged against the liabilities to form a “glide path.”
- The funding level is monitored frequently and reported to the plan sponsor.
- If the funding level reaches a certain point, this triggers automatic action by the provider in line with the glide path, which generally calls for a corresponding increase in the fixed-income allocation.
In this case, plans are improving the worst-case outcome and managing volatility in a very dynamic way. This activity is generally coordinated by the plan sponsor or consultant, working closely with the investment manager(s).

Tail risk management
Tail risk management techniques are used to try to mitigate extraordinary losses in portfolio value due to macroeconomic or other extreme market shocks. Sudden market declines precipitated by major events are typically accompanied by an increase in correlations across asset classes, loss of liquidity, an increase in volatility and a flight to quality. Tail risk management techniques are typically sophisticated strategies that involve the extensive use of index and volatility options, interest rate and futures options, sovereign and credit default swaps and currency and commodity-related options and futures.

There has been much interest in the United States in tail risk management, although adoption is still at low levels, mainly because the approaches developed by investment banks have been more esoteric than the market is ready to adopt, partly because they often include complex derivatives strategies with frequent asset allocation shifts.

Diversified growth portfolio
Diversified growth portfolios have evolved out of the traditional balanced approach and provide an opportunity for plan sponsors to invest in a portfolio made up of a host of traditional and nontraditional asset classes ranging from liquid listed securities to asset classes like private equity, hedge funds and commodities. The asset allocation decisions are made by the asset manager and typically include both strategic and tactical asset allocation shifts. Many of these portfolios are benchmarked to a premium over cash and are expected to capture a share of growth markets as well as to try to mitigate losses during market declines.

These types of portfolios can provide ease of access for small and midsized plan sponsors to alternative asset classes and high-quality asset management capabilities. Previously, only much larger and sophisticated plan sponsors would have either the scale or the investment expertise to oversee such diverse portfolios. Within the landscape of institutional investing, this concept is relatively new and while it is rapidly becoming common practice in certain markets such as the United Kingdom, it is still in the earlier stages of adoption in the United States.

Strategies to manage volatility
The strategy level is differentiated from the policy level in that it represents one level down in terms of implementation from a plan sponsor point of view. Once policy has been established, the question then turns to the implementation alternatives to manage volatility. We have grouped these into four categories, or implementation options, roughly sorted from left to right in order of increasing impact or influence on managing volatility (see Exhibit 3).

<table>
<thead>
<tr>
<th>Indexed and managed TE</th>
<th>Fundamental</th>
<th>Liability-driven investing (LDI)</th>
<th>Managed volatility</th>
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</thead>
<tbody>
<tr>
<td>• Smart beta</td>
<td>• High quality</td>
<td>• Long duration corporate and government</td>
<td>• Minimum variance</td>
</tr>
<tr>
<td>• Enhanced index</td>
<td>• Yield equity</td>
<td>• Custom LDI</td>
<td>• Long-short equity</td>
</tr>
<tr>
<td>• Quantitative</td>
<td>• Real assets</td>
<td>• Futures/Swaps</td>
<td>• Absolute return</td>
</tr>
<tr>
<td></td>
<td>• Opportunistic fixed Income</td>
<td>• Cash flow matching</td>
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<td></td>
<td></td>
<td></td>
<td>• Derivatives overlay</td>
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</table>

In Exhibit 3, in the first column, the Indexed and Managed Tracking Error category presumes a level of beta in the strategy. In these cases, one is essentially managing the active risk component, given the beta element of the strategy. As plans implement de-risking programs, they also want to be cognizant of the active risk component of the portfolio overall.

Smart beta refers to an approach whereby a passive portfolio is used to capture specific risk premia. While market-cap weighted benchmarks are the norm and equal-weighted benchmarks have been around for some time, other types of indices have recently been added to the available selection, and index funds that follow these indices are also accessible. These include style indices, momentum indices and fundamental indices. The theory behind this approach is that risk premia drive returns, and indeed, the assertion is that much of active management is in reality asset managers capturing these risk premia in their portfolio construction. So the knowledgeable investor might be able to replicate these superior “active” returns by using relatively cheaper passive
funds that aim to break down the equity risk premia into component building blocks and make these available as an investable index (e.g., Russell's dynamic and defensive indices). These indices are being explored and are slowly coming into use in the United States, while they are gaining broader acceptance in Europe and Australia.

**Enhanced indexing** strategies have existed for some time. They are seen as a way to save on fees and gain market exposure and the expected return embedded in the asset class, while adding some alpha on the margin through the different types of enhanced indices. The methods used in generating the premium over the benchmark can vary. Some approaches take credit risk with collateral in conjunction with index futures, while others use more traditional alpha-generating research to add value, while ensuring industry and factor exposures are constrained to a risk budget around the benchmark. Still other approaches, such as MFS’ Blended Research strategies combine fundamental and quantitative alpha signals while using client-specified active risk budgets. The continued pressure on fees and the need for alpha may well signal a resurgence in enhanced index strategies.

**Quantitative strategies** are another way of operating within a customizable risk budget framework. These are alpha-generating approaches that use predominantly quantitative models and factors to construct an actively managed portfolio. The flexibility of quantitative models and their ability to process vast amounts of data allows the construction of portfolios with very deliberate risk exposures. While these approaches fell out of favor in the aftermath of the 2008 – 2009 crisis, when performance suffered, they may be slowly gaining back some of their prior acceptance.

**High-quality fundamental strategies** are strategies in which the focus is on identifying high-quality companies to invest in, in some cases with a valuation overlay. Most of MFS’s fundamental equity strategies fall into this category. While the definition of high quality may vary, typically measures such as earnings stability and consistent earnings growth, strong balance sheets and a long management track record characterize these strategies. When combined with a focus on valuation, these strategies can be quite effective in participating in up markets while providing good downside risk management in weak markets and delivering strong overall performance records.

**Yield equity** is another variation that has been revisited of late. As the name suggests, these are equity strategies with a dividend yield focus. They generally involve investing in very high quality companies that pay a good yield. They tend to exhibit lower volatility because of the yield component and have a degree of price resilience.

**Real assets** are a collection of tangible assets including commodities, precious metals, timber, real estate and oil. They have a relatively low correlation with financial assets, equity markets in particular, and are typically included in a portfolio for the diversification benefits they offer to the portfolio as a whole. They can in fact have quite high volatility as individual asset classes.

**Liability-driven investing (LDI)** is a framework for developing investment policy and asset allocation, and a departure in concept from the asset-only framework that capital market theory has advocated over the past 25 to 30 years. LDI is not new, but it has really come into vogue in the past 10 years as companies have begun freezing and winding down their DB plans. This has naturally segued into companies looking at ways to hedge their financial risk, primarily their P&L volatility, because some of the DB plans have become very large balance sheet line items.

When plans adopt the LDI framework, there is an implicit inclusion of liabilities in the policy framework, with clear implications for asset allocation. Often this is employed in conjunction with a dynamic de-risking strategy at the asset allocation level. A portfolio may, for instance, set a de-risking policy and consequently reduce its equity market allocations and increase its fixed-income investments as its funded status improves. Plans may also decide to hedge their bonds to their liabilities so both the fixed-income asset portfolio and liabilities are equally responsive to changes in interest rates.

LDI has been steadily adopted for a few years now, but has seen a slowdown in the aftermath of the 2008 financial crisis. Plan sponsors have been prevented from embracing LDI more fully by the equity market losses and low returns of the past five years, which have caused funding levels to drop significantly. For many, there is a need to earn their way out of the funding hole they are in, and this requires delaying the adoption of de-risking policies and strategies.
LDI strategies include those mentioned in Exhibit 3: Long duration corporate; long duration government; custom LDI; and futures, swaps and cash flow matching.

In a normal interest rate environment, extending the duration of the plan’s fixed-income portfolio makes sense. One might go long bonds, for instance, by buying the long corporate index and/or the long government index and blending them in a way that roughly achieves the prevailing blended duration of those indices. This is an easy, low-cost way to increase the hedged proportion of a portfolio. While there will be mismatches, as this is not customized to the plan’s liabilities, it provides a good first step. Custom LDI is the more sophisticated option, in which a manager or consultant analyzes the plan’s specific liabilities and constructs a hedge portfolio that not only matches the overall duration of the fund but also matches the term structure of the liabilities to the term structure of the assets. The cost increases with this level of complexity, but it is more accurate and therefore more effective.

The last items in this category are futures, swaps and pooled swaps, along with cash flow matching. Swaps and futures are technically derivatives and thus require plan sponsors to accept the inherent risks. While they are not speculative derivatives, they are derivatives nonetheless, and the plan’s policies need to permit their use. They also introduce a layer of complexity in terms of mark-to-market valuation of the investments. The potential benefit of these instruments is that they are one of the few ways that an investor can access truly long durations, beyond what the cash markets can offer. Cash flow matching refers to matching the short end of one’s liabilities with the appropriate cash flow. This can be a component of a custom long-duration strategy.

Managed volatility refers to investment strategies that actively constrain the investment portfolio to a universe of low-volatility stocks or produce lower volatility portfolios because of the nature of the investment. The low-volatility anomaly suggests that one can achieve benchmark-like returns with a quarter to a third less market volatility (beta) by investing in low-volatility stocks.

A minimum variance approach seeks to achieve the least expected absolute volatility, given certain constraints, typically using a risk optimizer. Long-short equity strategies can be optimized to manage volatility. Absolute return strategies are not explicitly focused on managing volatility; however, given the desire to earn alpha regardless of market movements, these approaches tend to offer lower volatility. A volatility target strategy involves designing a portfolio that seeks a certain expected volatility target relative to an index. Given that a naive low-volatility portfolio has certain pitfalls, a modified approach can encompass fundamental research, risk guidelines and portfolio optimization. A derivatives overlay in this context is a type of portfolio solution in which a plan sponsor might place a put or a call option on the market based on the sponsor’s view of the market.

**Decision-making framework**

Investors will want to take into account the relevant questions in the following decision-making framework as they consider the appropriate risk management approach for their specific circumstances.

**Plan/Investor type**
Investor type, nature of liabilities, asset pool, regulatory constraints, strength of sponsor/investor, etc.

**Investment objectives and philosophy**
Is the investor more focused on enhancing return or mitigating risk? What is the ability of the sponsor to withstand unexpected outcomes?

**Governance framework**
Does the investor have the decision-making framework to effectively select and monitor the relevant policies and agents required to implement the desired approach?

**Investment expertise**
Does the investment committee possess or have access to the requisite investment expertise to appropriately implement and oversee a more complex investment program?

**Ability to estimate liabilities**
How precisely can one estimate liabilities? The greater the precision (e.g., pension liability), the larger the opportunity to manage potential outcomes.

**Desire to hedge liabilities**
Are liabilities significant relative to the organization’s financial or other priorities? What is the right tradeoff between precision and cost/complexity?
Risk budget
What is the overall risk budget? How is it being deployed, and what is the appropriate budget for the policy or strategy under consideration?

Tracking error budget
Implementation options can vary according to the tracking error budget. For example, if the overall objective is risk mitigation, in certain circumstances a tracking error budget can be irrelevant, which would suggest certain strategies are more suitable than others.

Economic environment
How do you decide what the appropriate entry and exit points are for certain strategies whose success is predicated on timing?

Ability to use leverage
Is there the willingness and ability to use leverage? What is the downside, and how will it be managed?

Cost/Benefit tradeoff
Strategies vary greatly in cost, span, influence and outcome. How will these be assessed?

The correct approach will vary depending upon the answers to all these questions, and what is appropriate for one investor may not be for another.

To illustrate the points made above, in Exhibit 4 below we show an example of the asset allocation of a hypothetical pension plan portfolio together with the accompanying volatility management techniques that could be used. In this case, the asset allocation is driven by a dynamic de-risking glide path, uses a number of other volatility management techniques and has a tail risk management overlay strategy. This example illustrates how a number of the policies and strategies reviewed in this paper can be applied to a portfolio engaged in dynamic de-risking.

Exhibit 4: Hypothetical pension plan portfolio

Asset allocation driven by dynamic de-risking glide path

<table>
<thead>
<tr>
<th>Equity portfolio</th>
<th>Fixed-income portfolio</th>
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<tbody>
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<td>Growth</td>
<td>Low volatility</td>
</tr>
<tr>
<td>Global equities</td>
<td>Emerging markets</td>
</tr>
<tr>
<td>Small cap</td>
<td>Absolute return</td>
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Tail risk management overlay

Volatility management techniques used

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<th>Strategy tools</th>
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</table>
Conclusion

“May you live in interesting times,” a proverb often referred to as the Chinese curse, is an apt characterization of our times. A number of factors have conspired to produce an investment environment characterized by periodic crises. In the past 15 years, we have witnessed the Asian debt crisis, the Russian debt default, the technology bubble bursting and, most significantly, the 2008 – 2009 financial crisis, with its deep global recessionary aftermath. This latest financial crisis, in particular, has left an indelible imprint on the minds of investors of all types. It is now an investment axiom that uncertainty and its first cousin, market volatility, are always in our sights, if not on our doorstep. Given this reality, institutional investors are increasingly adopting a formal approach to managing volatility, using both policy measures and appropriate strategies to do so. Investors would do well to educate themselves on the array of approaches and methods available even if they are hamstrung for the moment by low funding levels.