



MetLife[®]

MetLife U.S. Pension Risk Behavior IndexSM

Study of Risk Management Attitudes and Aptitude
Among Defined Benefit Pension Plan Sponsors

About MetLife

For more than 140 years, MetLife has been one of the country's most trusted financial services providers. In 1921, we were the first company to issue a group annuity contract. Today, we manage group annuity assets of over \$62 billion,¹ lead the market² with over \$36 billion in transferred defined benefit pension liabilities¹ and provide benefit payments to over one million annuitants every month.³

We have a 30-year track record in stable value with over \$20 billion in stable value business,¹ and have over \$17 billion of nonqualified benefit funding assets.¹

Finally, we hold a position of leadership in the financial market—with over \$501 billion in assets under management and over \$477 billion in liabilities we support.⁴ We are focused on high asset quality, strong ratings, skilled asset/liability management and careful management of our own \$15.3 billion in capital.⁵

The top credit rating agencies have repeatedly recognized us for our financial strength and our ability to build capital. MetLife is a trusted market leader—a thoughtful and insightful partner, combining a unique perspective for plan sponsors with the means to make solutions a reality.

¹ As of December 31, 2008.

² Based on LIMRA International Stable Value and Funding Agreement Products report, third quarter 2008 results—statistics for single premium buyouts and terminal funding.

³ Available through group annuity contracts issued by Metropolitan Life Insurance Company and MetLife Insurance Company of Connecticut. Like most annuity contracts, MetLife's contracts contain limitations, exclusions, and terms for keeping them in force. Please contact your MetLife representative for details.

⁴ MetLife, Inc. as of December 31, 2008. Assets under management include general account assets, separate account assets, and assets managed on behalf of third parties. Assets under management are reported under accounting principles generally accepted in the United States of America.

⁵ Includes \$11.9 billion in surplus and \$3.4 billion in investment reserves as of September 30, 2008 for Metropolitan Life Insurance Company. Reported on a statutory basis.

ABOUT THE RESEARCH PARTNERS

Bdellium Inc.: Bdellium Inc. helps retirement plan sponsors, institutional investors and fund managers to reduce risk and improve performance by implementing better decision-making processes. Bdellium offers clients deep industry knowledge supported by strategic planning and operational management experience, advanced technical skills and sophisticated analytical tools. Bdellium fosters collegiate working relationships that encourage creativity and innovation, supported by disciplined process and relentless attention to detail.

Greenwich Associates: Greenwich Associates is the leading international research-based consulting firm in institutional financial services. Greenwich Associates' studies provide benefits to the buyers and sellers of financial services in the form of benchmark information on best practices and market intelligence on overall trends. Based in Stamford, Connecticut, with additional offices in London, Toronto, Tokyo, and Singapore, the firm offers over 100 research-based consulting programs to more than 250 global financial-services companies.

Pension Governance, Incorporated: Pension Governance, Incorporated is an independent research and analysis company that focuses on benefit plan related investment risk, corporate strategy, valuation and accounting issues, with the fiduciary perspective in mind.

Foreword

As our nation approaches what may arguably be the most turbulent and challenging economic environment in the last 50 years, how well plan sponsors manage the risks associated with their defined benefit pension plans has taken on increasing importance.

When MetLife set out to commission research of the leading U.S. defined benefit pension plans, we did so with two goals in mind. The first was to gain insight into plan sponsors' views of the major risks that affect their companies' defined benefit pension plans. The second, equally if not more important, was to assess how well plan sponsors believe they are managing those risks.

By any important measure, what the inaugural MetLife U.S. Pension Risk Behavior IndexSM study revealed is very clear: most plan sponsors, regardless of plan design and size, have an opportunity to develop a broader view of the risks to which their plans may be exposed. Among the many survey findings found on the following pages, MetLife has introduced the MetLife U.S. Pension Risk Behavior IndexSM, which develops a baseline for the current state of risk management within defined benefit plans—and seeks to identify early warning signs of potential risk management gaps for plan sponsors.

It is our intention to have this inaugural study serve as a benchmark for which future defined benefit risk management aptitude and attitudes can be measured. Over time, our hope is that plan sponsors find the study helpful as they explore solutions for mitigating risk exposure that will better enable their plans to deliver on the promise of a secure retirement for their workers.



William J. Mullaney
President, Institutional Business

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Executive Summary

Defined benefit (“DB”) plans in the U.S. account for \$2.3 trillion in assets and cover nearly 42 million plan participants, of whom over 20 million are active employees, according to the U.S. Department of Labor.¹ Though shrinking in number, these traditional employee benefit plans remain an important part of the investment and retirement security landscape. In light of this, it is perhaps surprising that relatively little is known about how effectively these plans are managing their risks. At a time of great market volatility, a close examination of the full range of plan risks and the tools available to manage those risks is of critical importance.

While the legacy of the extraordinary financial market events of 2008 is yet to be determined, it is certain that it will include an enduring awareness that risk management practices are only as effective as the depth of understanding of the risks themselves.

The research underlying this study was performed before the market downturn. The downturn presents enormous challenges, and it is not suggested by any means that this study provides easy or full answers to those challenges. The hope is that this study can provide new perspectives on risk management methodologies that can, along with other factors, help in the recovery and in preparing for the future.

THE CURRENT STATE OF RISK MANAGEMENT

The primary objective of the MetLife U.S. Pension Risk Behavior IndexSM research, a quantitative study of large plan sponsors supplemented by a series of in-depth individual interviews, is to develop a

MetLife designed and fielded this study to encourage public dialogue around pension risk-related issues for plan fiduciaries, help plan sponsors develop a new framework for understanding risks, and explore solutions for mitigating risk exposure.

baseline for the current state of risk management within DB plans—and to identify early warning signs of risk management gaps. This study is comprised of two parts: an index (which measures the extent to which plan sponsors are managing the risks they believe are most important) and an analysis (which examines patterns and inter-relationships between risk attitudes and behaviors). MetLife designed and fielded this study to encourage public dialogue around pension risk-related issues for plan fiduciaries, help plan sponsors develop a new framework for understanding risks, and explore solutions for mitigating risk exposure. It should be noted that the conclusions throughout the report are those of MetLife and its research partners, and do not necessarily reflect conclusions by the plan sponsor community.

NOT ALL RISKS GET EQUAL ATTENTION

This report presents plan sponsors’ views on current risk management practices and identifies inconsistencies between the risks plan sponsors view as “important” and those they say they are managing effectively.

In order to understand how executives prioritize and then act on various DB pension-related risks, the survey measured the relative importance ascribed to 18 risk factors by respondents. The risks were identified by MetLife in consultation with leading industry experts.

The study found that most plan sponsors focus on only a few factors rather than addressing the full range of relevant risks. Furthermore, survey responses

¹ U.S. Department of Labor, Employee Benefits Security Administration, Private Pension Plan Bulletin Historical Tables, February 2008.

This study suggests a wide gap between the importance plan sponsors ascribe to each risk area and the sponsors' own reported success at managing those risks.

indicated many occasions where plans were not addressing the risks they viewed as most important.

Top ranked risk factors, by importance, included "asset allocation," "meeting return goals," "underfunding of liabilities," "asset-liability mismatch," and "accounting impact." Mandatory disclosures that hit the balance sheet or are part of regulatory filings are visible and readily measured. Since company senior management, including pension decision-makers, are frequently evaluated on the basis of financial reporting measures, it is not surprising that many of the most important risk items are those that directly affect the publicly disclosed numbers. Additionally, this finding is consistent with the well-established practice of expressing pension management in terms of asset or investment allocation-related terms.

By contrast, the risk factors that received the least amount of attention from survey respondents include "longevity risk," "mortality risk," and "early retirement risk." While it is plausible that some risks would be considered less equal in terms of likely economic or fiduciary impact, a low ranking of longevity risk does not reconcile with demographic trends. As people live longer, plan sponsors must decide how best to ensure adequate cash flows for each additional year that participants receive benefits. Another surprise is the relatively low ranking attached to "investment valuation," especially since DB plans are collectively investing billions of dollars in "hard-to-value" assets. This was particularly interesting as the assessment of this risk had no particular correlation to plan size. It is also

interesting to note that process quality received an even lower overall importance ranking, given that ERISA is a process standard.

GAPS BETWEEN "IMPORTANCE" AND "SUCCESS"

The climate for change tends to be greatest when decision-makers acknowledge the need to improve current practices. The study measured plan sponsors' perceptions around risks in two dimensions: one that measured the relative importance ascribed to 18 DB pension plan risks, while the other looked at how well they think they are doing. Looking at those two dimensions, this survey suggests a wide gap between the importance plan sponsors ascribe to each risk area and the sponsors' own reported success at managing those risks. Overall, more than two-thirds of all plans studied indicate some degree of inconsistency in how they view and manage pension plan risk, and about 15% show significant problems in this area.

For example, many respondents affirm their close attention to "Plan Governance," defined as the "exercise of effective, independent oversight, supported by internal controls within all areas and at all levels of plan management." However, the balance of the study's findings suggests otherwise.

"Liability Measurement" is another risk factor that suggests gaps between attitude and behavior. Defined as "whether the plan sponsor routinely reviews liability valuations and understands the drivers that contribute to the plan's liabilities," this risk, if carefully managed, should encompass a heavy emphasis on how broad

This research highlights the possibility that defined benefit plan decision-makers are missing a golden opportunity to effectively manage a wide array of risk factors, any of which has the potential to derail the sponsor's ability to make good on its promises to participants.

demographic aging patterns may influence a pension plan's expected benefit cash flows and related liability. Yet nearly all respondents ranked longevity risk low in both importance and success.

A disconnect between what is considered important and the ability of a plan sponsor to address a high-ranked risk factor is significant. Of 18 risk factors studied, eight were either ranked as above average importance but below average success or vice versa. Only two of the risk factors had the same ranking for importance and success. This research indicates the possibility that DB plan decision-makers are failing to effectively align importance and success across a wide array of risk factors. Failing to align importance and success, while there is still time to do so with flexibility, has the potential to derail the sponsor's ability to make good on its promises to participants.

A CALL TO ACTION

Pension plan decision-makers should be encouraged to embrace and act on a plan's economic realities (rather than point-in-time accounting measurements of assets and liabilities). The ramifications of inaction or incomplete decision-making could be considerable, particularly if they are not anticipated. Consider the costs associated with a plan freeze or a large dollar hedge transaction that does not reflect a holistic approach to plan management.

The potential for flawed decision-making abounds. For example, a plan might decide to invest in "complex" alternative fund pools in order to satisfy

return-seeking objectives yet end up with insufficient plan cash flows if it fails to consider liquidity, valuation and/or accounting risks. An allocation to a particular money manager may be part of a strategic asset allocation decision but create fiduciary problems if fees are ultimately deemed "too high" or the strategy is found to be unsuitable. In addition, the study findings reveal that plan sponsors are not looking at accounting, economic and actuarial risks holistically, which may result in outcomes that don't match the sponsors' intentions.

The results of this large-scale research study should be a call to action for pension plans not yet comprehensively and systematically managing risk. Readers are encouraged to consider tactical actions and decisions in the context of their impact on the enterprise—or at least the entire DB pension plan. An environment without commonly accepted pension governance and risk management standards can leave plan fiduciaries in a challenging position at a time when scrutiny is arguably at its highest point in the last two decades. Nonetheless, current market volatility and fast-changing regulations make one thing clear: pension decision-makers will continue to face new challenges. The costs associated with an incomplete process are only likely to become greater with time, and may take on greater visibility as the "one size fits most" approach to pension plan management gives way to more firm-specific strategies driven by balance sheet, income statement or cash flow concerns rather than the more predictable and stable asset allocation and performance benchmark measures of prior years.

Background

REGULATORY LANDSCAPE

Over the past few years, regulators have introduced numerous new disclosure and accounting rules. These include the Pension Protection Act of 2006 as well as new disclosure rules² (both enacted and pending) by the Financial Accounting Standards Board, which are changing the transparency with which DB plans are reported and managed. Should FASB proposals to account for changes in funded status through the income statement become effective, this could further emphasize the link between the current health of a corporation's DB pension plan, its ability to sustain the plan relative to its operating earnings and, in the case of a public company, its share price.

It's important to note that the new and proposed regulations are at once far-reaching yet still incomplete. FASB and ERISA each focus on specific aspects of pension plan management. While each is useful and valuable by itself, they are not designed to work in concert with one another. As a result, U.S. plan sponsors tend to manage to the required regulations which can result in a fragmented approach to pension risk management. This differs to some degree from sponsors in the U.K., Denmark, and Holland where regulations are more comprehensive. Without a change to the basic

regulatory structure in the US, which is unlikely, or a broader awareness of this problem, sponsors are likely to continue to view and manage risks in a tactical and fragmented—rather than strategic—way. They may likely use models and measures that can lull them into security. In many cases, they may manage and measure risks that may not be the most important ones. Taking shortcuts by not looking at risks holistically may end up costing a plan sponsor money, time, and potential harm to reputation.

Narrow or incomplete risk management processes can be dangerous in the best of times. But in today's turbulent markets—when the economic environment is challenging, financial markets are under extreme stress and target returns are increasingly difficult to achieve—holistic risk management should be a new baseline approach. Today's corporate plan sponsors must be more vigilant than ever in identifying the full range of both short term and long term risks associated with their DB plans—and in developing tools and protocols for managing these risks.

Absent a call to action, as long as current regulations define operating and fiduciary responsibility in fragmented terms, sponsors are unlikely to manage pension plan risks in a holistic way.

² In particular, Statement of Financial Accounting Standards ("SFAS") 158, "Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans" requires recognition in the balance sheet of the funded status of defined benefit plans and other postretirement benefit plans and the recognition in accumulated other comprehensive income of unrealized gains and losses. The funded status is measured as the difference between the fair value of a plan's assets and the projected benefit obligation of the plan.

MetLife U.S. Pension Risk Behavior IndexSM

A BASELINE FOR RISK MANAGEMENT PRACTICES

In this ground-breaking inaugural study, MetLife worked with Bdellium Inc., Greenwich Associates, and Pension Governance, Incorporated to survey large pension plan sponsors in the U.S. Data from this survey were used to calibrate the importance that these companies ascribed to managing each risk, their success at implementing comprehensive practices to manage each risk and the consistency between the two, effectively measuring both attitude toward, and aptitude for managing, pension plan risks.

The results of this research have been synthesized into the MetLife U.S. Pension Risk Behavior IndexSM ("PRBI"), which reflects DB plan sponsor attitudes towards, and aptitude or effectiveness in comprehensively addressing pension risk. The PRBI takes account of the relative importance of each risk and the relative size of each retirement plan. This year, the PRBI establishes a baseline for risk management practices against which future changes may be measured. Over time the PRBI will track the extent to which comprehensive measures are being adopted to protect DB plans from an extensive range of both near and longer term risks.

The PRBI is constructed in three steps:

Step 1

In Step 1 we calculate an average success rating for each respondent that incorporates the plan sponsor's self-reported success at managing each of 18 risks, weighted by the relative importance that sponsor ascribed to each risk.

Step 2

Step 2 aggregates the results across all plan sponsors by calculating an industry average success rating. The contribution of each individual respondent's result to the industry average is weighted by the relative asset size of their DB plan(s).

Step 3

The rating results obtained in both steps one and two are on an arbitrary scale of 1 to 5. In the final Step 3, we convert the raw industry average success rating into a standardized scale from 0 to 100.

The higher the value on the PRBI the more plans are being managed by sponsors who are successfully addressing important risks. A fall in the PRBI value would most likely indicate that certain risks have taken on additional importance but that sponsors are not yet successfully addressing those risks.

The Appendix explains in detail the methodology used to calculate the PRBI.

INDEX VALUES: ROOM FOR IMPROVEMENT

The PRBI is built on responses by individual plan sponsors as to whether they agree that they are successfully addressing various risk issues. An individual success rating of 1 or 2 indicates that they disagree strongly or somewhat disagree that they are successfully addressing the risk. A value of 3 indicates that a plan sponsor neither particularly agrees nor disagrees that they are successfully managing risks. Values of 4 or 5 indicate agreement or strong agreement respectively that they are managing the relevant risk.

At a minimum, the research team would like to see every plan sponsor at least agreeing that they are addressing important risk items. This would translate into both an individual *Importance-Weighted Average Rating* for each plan sponsor and an industry average success rating of 4.0. The equivalent PRBI value is 75. This therefore sets a minimum acceptable index value. While it is unrealistic to expect to achieve an index value of 100, a target of 87 would not be unreasonable.

Based on an analysis of 153 respondents, the inaugural value of the Pension Risk Behavior Index is 76 out of 100. This reflects the more detailed findings of this study that there is significant scope for plan sponsors to improve the processes by which they prioritize and address the full range of pension risks.

In addition to its absolute level, the PRBI score for this inaugural year also establishes a baseline against which future changes can be measured.

Relative ratings of “importance” are likely to change over time and will be driven both by external trends, the views of the advisor community and emerging common practices among DB practitioners. Currently, sponsors are greatly influenced by the views of their advisors (i.e., accountants, pension consultants, actuaries, and investment managers). The risks that this group promotes as “mainstream” at a given point-in-time are likely to receive a high importance ranking.

External trends also influence the PRBI rating and are likely to take one of two paths:

- > **Slow evolution** that can be handled in an orderly fashion with incremental adjustments, e.g. demographic-related shifts;
- > **Sudden change** that is disruptive and requires a rapid response (including accounting rule changes, major market shifts).

Over the next 12 to 24 months, MetLife expects advisors and external market forces to put more importance on liability-related risks. Demographic trends (e.g. the aging workforce, baby boomers entering retirement) are joining with regulatory forces to make liability management critically important. Longer term, liability-oriented risks will become increasingly transparent, due to the PPA and the reduced latitude with respect to mortality tables and discount rates.

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Importance of Managing Pension Risks

EASE OF MEASUREMENT DRIVES IMPORTANCE

The PRBI tells part of the risk management story. The remainder is told by patterns that exist between respondents’ risk attitudes and behaviors.

Looking first at attitudes, we see that the risk factors that plan sponsors rate as “most important” are the factors that are easiest to model and measure. The risk factors that receive the greatest attention on the part of plan sponsors are (in descending order of importance):

- > **Asset Allocation**—*We use disciplined rebalancing to implement a documented strategic asset allocation policy*—was selected 54% of the time as the risk factor to which plan sponsors pay most attention.
- > **Meeting Return Goals**—*We have policies and procedures in place to determine our return goals, to identify the reasons for any deviation between actual results and goals and to take appropriate action in a timely manner*—was selected 49% of the time.
- > **Underfunding of Liabilities**—*The design and execution of our investment strategies have proven effective in comfortably managing our funding contribution levels*—was selected 47% of the time.
- > **Asset and Liability Mismatch**—*We carry out regular studies that have proven accurate and effective in managing mismatches between the duration of plan assets and liabilities*—was selected 43% of the time.

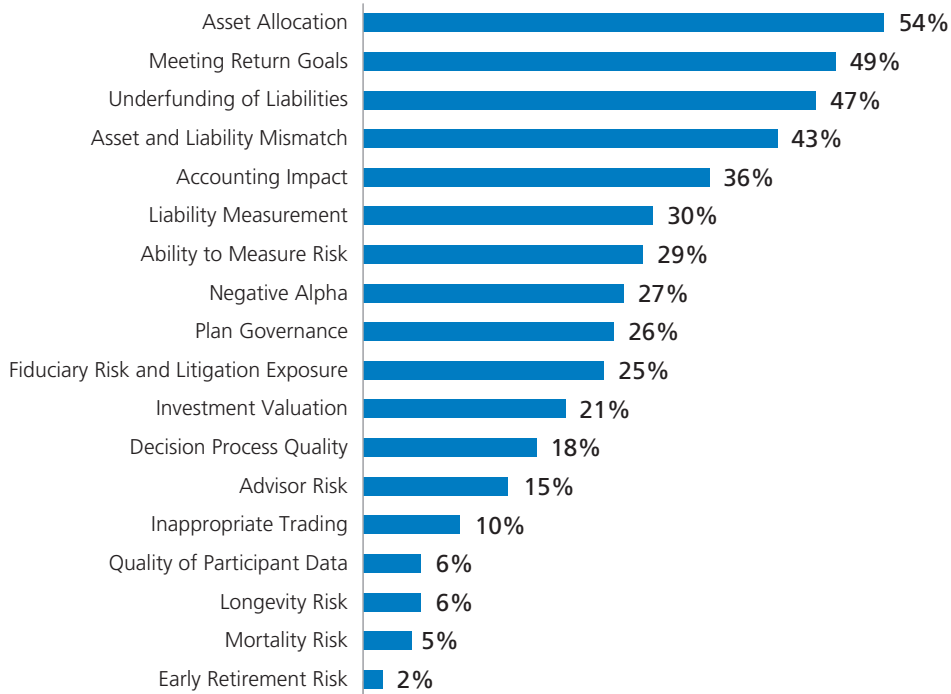
The four risk factors that receive the least attention from respondents are:

- > **Early Retirement Risk**—*We actively implement and regularly review the effectiveness of procedures to manage the impact of early retirement risk on the level and timing of future liabilities*—selected only 2% of the time as the risk factor to which plan sponsors pay the most attention.
- > **Mortality Risk**—*We have modeled and understand how the expected mortality of our participants affects our plan cash flows*—selected 5% of the time.
- > **Longevity Risk**—*We implement and regularly review the effectiveness of procedures to mitigate, transfer or actively manage the risks associated with increasing longevity among plan beneficiaries*—selected 6% of the time.
- > **Quality of Participant Data**—*We implement a procedure to ensure that census information on plan participants is correct and complete*—selected 6% of the time.

These findings suggest that while the conversation is beginning to move beyond an asset-based model, no consensus has yet emerged as to what will replace it. Asset and investment risk mitigation is tactical (yet sophisticated), and there are accepted methodologies, models and measurement tools available to manage these risks. The question, of course, is: are these models and tools enough? Sophisticated investment risk models can miss a recognition of systemic risks related to investments that outweigh risks associated with a particular holding or strategy.

Chart 1: Importance Selection Rate

How often each risk item was selected as the “most important” when presented with other risk items.



One explanation for the relatively low importance of longevity risk, mortality risk, and early retirement risk is that the speed of change for these factors is slow. Mortality and longevity tend to change more slowly than interest rate changes (and the valuation of liabilities) and/or market volatility (and the valuation of assets). With time to react, fund executives may be less concerned about these risks in the near-term, while attentive to their long-term impact. New mortality tables required by the PPA used for valuing liabilities for funding (not accounting) purposes take one step in the direction of adding visibility to this risk, as they begin to factor in some improving mortality in the future, though this step falls far short of the much more significant focus in this area that has emerged in the U.K. over the past several years. Indeed, the U.K. is generally recognized as being ahead of the U.S. in considering liabilities as centric to asset allocation decisions.

Anecdotally, it appears that early retirement risk may be viewed by some plan sponsors as a restructuring item and therefore not central to pension risk management. Another possibility is that many may associate this risk with “early and out” incentive programs, and that such programs have become far less common in recent years. Still, most firms do

have subsidies embedded in the formulae for those retiring before their normal retirement date but after attaining normal minimum retirement eligibility, such as age 55 and 10 years of service. When defined in this way, early retirement appears to not be fully understood (and managed) by most plan sponsors—while they know it can happen, many may not understand the extent to which it can affect the cash flow patterns of their plan.

The low importance ascribed to the quality of participant data perhaps reflects insufficient understanding of the potential dangers. While data quality is a “mainstream” issue in the U.K. pension market, it is frequently not appreciated in the U.S. until it surfaces, for example, in pension closeout situations. Many systems have incomplete documentation, often losing track of terminated vested lives. The quality of data is crucial throughout the life of a pension as poor record keeping can lead to significant additional costs in a number of areas including administration, inaccurate actuarial valuations and even litigation. In a pension risk transfer, it can play a part in the pricing of quotes and indeed it could even deter insurers from quoting.

The *Importance Selection Rate* for each risk item is the percent of times that each risk item was selected

in Section 2 of the survey as receiving the most attention relative to the other risk factors. Chart 1 lists the Importance Selection Rate for each of the 18 risk items.

We would expect risks to be prioritized and therefore to receive different levels of attention. However, the observed range is large between the risk items that receive the greatest and the least attention across all respondents. The top four risk items receive a disproportionate level of attention while the bottom four items are all but ignored. Asset Allocation (the most important attribute), is ranked “most important” 54% of the time, and selection becomes increasingly diffused from that point on, as thirteen of the 18 factors were picked as most important less than 30% of the time. Conversely, some factors were virtually never included among the most important.

MOST RESPONDENTS FOCUS ON A HANDFUL OF RISKS

The extreme range of relative importance at the aggregate level reflects an equal lack of uniformity in the responses from individual plan sponsors. If we look at the data for individual respondents, most emphasize a minority of risk items and there is no consensus across plan sponsors as to which risk items receive the greatest importance.

Because of the structure of the survey questions, every respondent had to select a minimum of four different risk items. Selecting more risk items implies that sponsors are keenly aware of the need

to manage a wider range of risks, although, as the number of items selected increases we must also consider the consistency of preferences implied by each selection.³ While two respondents ascribed particular importance to 13 risk items each, 113 or 74% of plan sponsors selected 9 or fewer items. In the most extreme case, one respondent selected only six items, barely above the minimum and suggesting a very narrow attention range.

The fact that most individual pension plan managers seem to be focusing on a small cluster of risks and neglecting others, suggests that less-considered risks may represent a significant soft spot in present pension management practices.

In order to provide a standard measurement for comparison purposes, MetLife computed a *Risk Importance Concentration* value for each respondent. *Risk Importance Concentration* measures the extent to which a plan sponsor is overly concentrating on a relatively small number of risk items rather than paying attention to the full range of risks. This measurement takes into account both the number of risk items and the relative level of importance ascribed to each. The *Risk Importance Concentration* value equals 0.00% if equal importance is attributed to all 18 risk items and equals 100.00% if all importance is being ascribed to just one risk item.

Table 1 shows summary *Risk Importance Concentration* statistics based on the separate results for each of the study respondents. The table also

³ The study analyzed the consistency of preferences implied by the risk items each respondent selected in Section 2 of the survey. A first order inconsistency is when a respondent makes selections that simultaneously imply that A is more important than B and that B is more important than A. A second order inconsistency is one where the choices imply that A is more important than B, B is more important than C but C is also more important than A. As expected there is a positive correlation between the number of different risk items selected and the level of inconsistency. However, overall, both the first order and second order inconsistency rates were less than 1%.

Table 1: Risk Importance Concentration Summary Statistics

Summary Statistic	Value
Maximum Risk Importance Concentration among Individual Respondents	78%
Median Risk Importance Concentration among Individual Respondents	65%
Minimum Risk Importance Concentration among Individual Respondents	38%
Aggregate Risk Importance Concentration across all Respondents	30%

shows the equivalent value derived by aggregating the responses across all respondents.

In the previous section, we noted the extreme differences between the *Importance Selection Rates* for the top and bottom risk items based on the aggregate data from all respondents. The distribution of these aggregate *Importance Selection Rates* equate to a *Risk Importance Concentration* of 30%, as shown in the last row of Table 1.

However, when we compare this value to the range of results across the individual respondents, we can see that the aggregate data actually understates the concentration of importance exhibited by individual respondents. The aggregate *Risk Importance Concentration* value of 30% implies a lower level of concentration than even the best case of 38% observed for any individual respondent. The median *Risk Importance Concentration* is 65%, and the highest concentration was close to 80%. These last two numbers provide further evidence that each sponsor is typically focusing on just a handful of risks. While there is no one “right” concentration result for all plans, a risk concentration factor between the best case and mean implies a balanced approach to risk awareness.

Furthermore plan sponsors are not focusing on the same risks, as demonstrated in Table 2. This table shows summary statistics about the *Importance Selection Rate* for each of the 18 risk items across 153 respondents. The second column reports the percentage of respondents who selected the corresponding risk item at least once from within a choice set as being the most important. These values complement the data in Chart 1,

providing further insights into the wide disparity in importance ascribed to each risk item. The most important item, Asset Allocation, was selected by 81% of respondents while the least important, Early Retirement Risk, was selected by only 8% of respondents. Furthermore each of the four least important risks was selected by fewer than 25% of respondents. Of course, a portion of this would be expected as a result of specific plan features.

The third column shows the average of all the *Importance Selection Rates* for each risk item across all respondents, while the final column shows the corresponding standard deviation values. In the case of 12 of the 18 risks the standard deviation of *Importance Selection Rates* exceeds the average of those rates. This is indicative of an extremely wide range of importance in respect of the same risk item across all respondents.

Overall, these numbers demonstrate that there is little consensus as to relative importance of specific risks that different people select. The variation in the number of respondents who ascribed any importance to each risk item, the wide range of *Importance Selection Rates* values and the high standard deviation of the individual *Importance Selection Rates* values relative to the mean for each risk item are all strong evidence that the risks to which respondents pay particular attention vary significantly from plan to plan.

Implications

Understandably plan sponsors are hesitant to stray too far from the consensus views of their peers. Furthermore, when consensus exists, resources can be focused on fewer issues yielding better solutions

Table 2: Summary Statistics for Importance Selection Rates across 153 Respondents

Risk Item	Percentage of Respondents Selecting Risk Item	Mean Importance Selection Rate	Standard Deviation of Importance Selection Rates
Asset Allocation	81%	54%	36%
Meeting Return Goals	82%	49%	34%
Underfunding of Liabilities	79%	47%	34%
Asset and Liability Mismatch	75%	43%	34%
Accounting Impact	61%	36%	36%
Liability Measurement	67%	30%	28%
Ability to Measure Risk	59%	29%	30%
Negative Alpha	50%	26%	32%
Plan Governance	56%	26%	29%
Fiduciary Risk and Litigation Exposure	56%	25%	27%
Investment Valuation	50%	21%	25%
Decision Process Quality	41%	18%	26%
Advisor Risk	41%	15%	21%
Inappropriate Trading	24%	10%	21%
Quality of Participant Data	15%	6%	18%
Longevity Risk	16%	6%	15%
Mortality Risk	14%	4%	12%
Early Retirement Risk	8%	3%	9%

that can be applied by all. However, the danger of long-established consensus is inertia, in which emerging risks are slow to be identified, prioritized and addressed.

This finding of this survey indicates that whatever past consensus existed in respect to risk priorities has been replaced by a much more diverse view among plan sponsors as to what risks require the most attention. Likely explanations are the increasing range and complexity of potential risks and the increasing emphasis, through new disclosure

requirements, on the particular circumstances of each retirement plan.

For example, historically, plan sponsors have focused almost exclusively on asset allocation and the management of near-term risks. Over the next few years, MetLife expects to see an increased focus in liability management. As the Pension Protection Act moves into its second year and discussion of potential further changes in accounting continue, the way that employers view and manage plan liabilities is beginning to change.

These changes present plan fiduciaries with some serious challenges. One major challenge is the lack of a market-standard tool or process for handling the liability side of pension risk management. Another (as noted earlier) is the longer-term risk horizon for certain factors such as longevity, mortality, and early retirement. In the case of these risks, exposure can go undetected for a significant period of time. Still, if worker demographics and/or behavior are not closely studied, a plan could be in for an unpleasant surprise—especially, for example, (as in the case of early retirement risk) if the plan adopted a lump sum option back in the 1990s.

Furthermore, in the absence of consensus, pension governors must develop decision-making processes that enable them to independently establish and address priorities based on their particular circumstances.

The findings uncovered by this survey indicate that plan sponsors are not implementing comprehensive decision-making processes that integrate all relevant information, carefully weigh the relevance and value of each piece of information and explicitly address trade-offs. As a result, certain risk factors exert disproportionately high influence while other critical risks are overlooked. The result is suboptimal (and in many cases actually flawed) decision making. Unless the decision-making process itself is improved, adding more information will not necessarily result in better decisions or better outcomes. Rather, it may result only in further data overload and confusion.

MARKET CLUSTERS: TWO GROUPS DISCERNIBLE

On an aggregate level the study shows that respondents are paying particular attention to asset allocation, meeting return goals, underfunding of liabilities, and asset and liability mismatch. However, it also shows that individual respondents differ significantly in the attention they are paying to each risk item. MetLife, therefore, conducted a cluster analysis to see if the total sample naturally formed discernible sub-groups based on similarities in the Importance Selection Rate patterns exhibited by each respondent.

Table 3 shows the results of this analysis, which identified two discernible clusters. The first section of the table shows risk items that receive more attention from Cluster 1 than Cluster 2. The second section of the table shows risk items that receive more attention from Cluster 2 than Cluster 1. Each section is ordered by the absolute difference between the Average Selection Rates for each risk item.

These results suggest that two distinctively different priorities motivate the separate groups. Cluster 1 might be characterized as the “investment driven” group. Its members pay most attention to meeting return goals, investment valuation, plan governance, inappropriate trading and asset allocation.

Incomplete and/or incorrect data can lead to litigation risk and can curtail financial options such as risk transfers.

Table 3: Average Importance Selection Rates by Cluster⁴

Risk Item	Average Selection Rate		Cluster 1 minus Cluster 2
	Cluster 1	Cluster 2	
Meeting Return Goals	67%	32%	34%
Investment Valuation	33%	9%	23%
Plan Governance	36%	17%	19%
Inappropriate Trading	22%	3%	19%
Asset Allocation	62%	50%	12%
Negative Alpha	32%	21%	11%
Decision Process Quality	23%	16%	7%
Quality of Participant Data	8%	4%	5%
Fiduciary Risk and Litigation Exposure	26%	22%	4%
Ability to Measure Risk	31%	30%	1%
Underfunding of Liabilities	23%	65%	- 42%
Asset and Liability Mismatch	29%	58%	- 29%
Accounting Impact	23%	49%	- 26%
Liability Measurement	24%	39%	- 15%
Longevity Risk	0%	12%	- 12%
Mortality Risk	1%	8%	- 7%
Advisor Risk	12%	15%	- 3%
Early Retirement Risk	1%	3%	- 2%

We noted earlier the impact of accounting as a catalyst for increasing plan sponsors attention to liability issues. Cluster 2 might be characterized as the “accounting driven” group. Its members clearly place higher priority on under-funding of liabilities, asset and liability mismatch, accounting impact and liability measurement.

It is interesting to note that conventional features such as plan size were not a factor in determining cluster composition.

Implications

Self-knowledge is a good beginning, and this study provides an initial step in the process for plan sponsors to ask themselves if they fall into one of these categories. The prescription for sponsors in either group is to broaden their awareness of risk factors outside their present comfort zone, and assess whether any of the less-considered risks should be given more attention for a more balanced understanding of the plan’s dynamics.

⁴ The clustering method used was k-means. The degree of similarity between any two respondents was measured by the sum of the squared differences between their *Importance Selection Rates* on each risk item. The sample was divided into 2, 3, 4, and 5 clusters and the quality of the results compared. The most natural result occurred when the sample was divided into 2 clusters.

Perceived Success in Managing Pension Risk

Turning next to plan sponsor behavior, we see that, once again, the risks selected as “most successfully managed” are those that are easiest to measure and model.

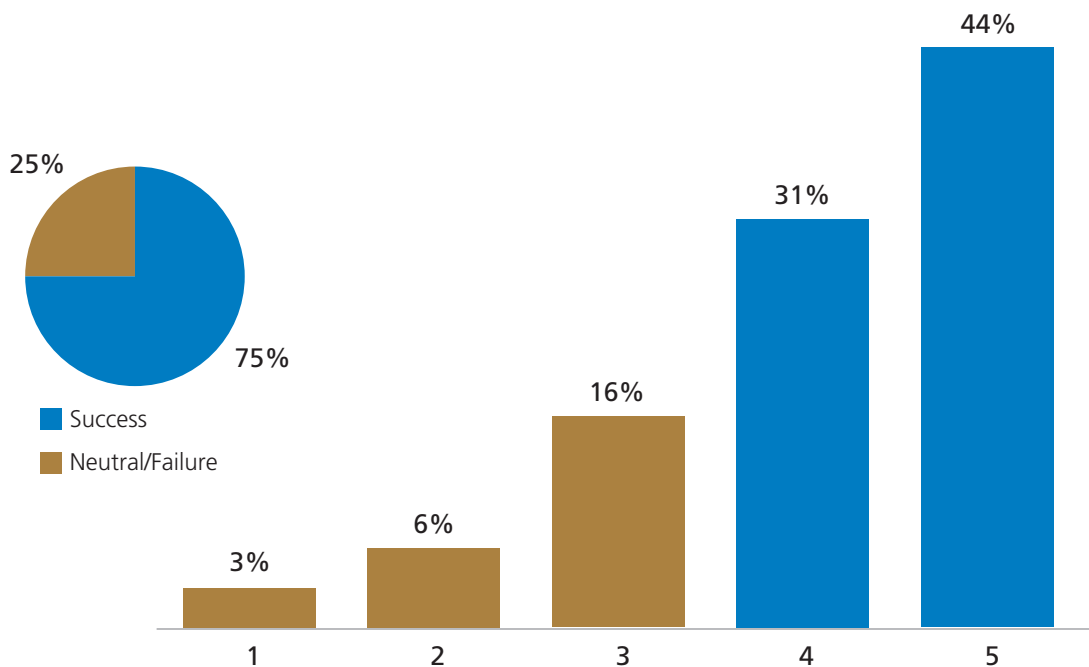
Each respondent was asked to rate on a scale of 1 through 5 how strongly they agreed with each of 18 risk management statements. The rating was used as a proxy for how successfully the sponsor is implementing comprehensive measures to manage each risk item. A rating of 1 or 2 therefore indicated failure, 3 was neutral and a 4 or 5 indicated success.

OVERSTATING REPORTED SUCCESS

Chart 2 shows the distribution of the rating results across all items and all respondents. The inset pie chart highlights the fact that in 75% of the instances where a rating was provided, respondents indicated by a rating of 4 or 5 that they are successfully implementing the risk management measures described. Moreover, 44% of the respondents prescribed a 5 rating to the risk management questions, so the plan sponsors are not just confident that they successfully manage risk... they are very confident.⁵

Chart 2: Success Rating Frequency

How often respondents rated themselves on each point in the “Success” scale
1 and 2 = “Failure”, 3 = “Neutral”, 4 and 5 = “Success”



⁵ Figures represent the number of respondents multiplied by the number of questions per respondent, for a possible total of 3,024 ratings. No rating was provided in 69 or 2.28% of the cases.

This upward skew is to be expected in any survey based on a self-assessment of performance, and may reflect a natural reluctance to publicly acknowledge weaknesses in respondents' risk management practices. While steps can be taken to control for this bias, caution must be exercised in reading too much into a high absolute rating level. On the other hand, comparative analysis of ratings remains valid and can provide useful insights. Indeed, given this strong upward bias, a relatively low rating takes on additional importance as an indicator of weak risk management.

REPORTED SUCCESS UNDERSCORES INCONSISTENCIES

The three risk items in relation to which the respondents reported greatest risk management success (on a scale of 1–5) are:

- > **Asset Allocation**—*We use disciplined rebalancing to implement a documented strategic asset allocation policy*—received an Average Rating of 4.60.
- > **Plan Governance**—*Those responsible for plan governance exercise effective, independent oversight, supported by internal controls within all areas and at all levels of plan management*—received an Average Rating of 4.58.
- > **Liability Measurement**—*We routinely review liability valuations and understand the drivers that contribute to our plan's liabilities*—received an Average Rating of 4.51.

Most plan sponsors consider that these risk areas are relatively straightforward. Asset allocation, for

The behavior of liabilities relative to assets proves much more difficult for most plan sponsors to manage.

example, is a closely watched area, with significant input from independent advisors with robust asset allocation models. ERISA and later rule-making has, similarly, set clear standards for certain aspects of plan governance and outlined equally clear consequences for noncompliance. And, liability measurement must be reported for accounting purposes each year.

Looking a bit deeper on each of these three apparently straightforward areas offers the perspective that even the actions plan sponsors take in these areas may not be as robust as sponsors believe them to be. For example, asset allocation is usually measured against an investment policy statement, but if the policy statement does not adequately take into account a plan's cash flow requirements, the allocation assessment may offer a hollow reassurance. Similarly, a FAS 87 measurement provides what GAAP accounting rules require—a present value of future benefits. What may not be so readily apparent is that two firms with very different liability cash flow characteristics and, therefore two different risk profiles, can produce the same present value of future liabilities.

On a scale of 1–5 respondents reported the lowest success ratings for:

- > **Decision Process Quality**—*We periodically assess the effectiveness of our decision-making processes by explicitly considering the links between the way in which we make decisions and the outcomes of those decisions*. This received an Average Rating of 3.50.
- > **Longevity Risk**—*We implement and regularly review the effectiveness of procedures to*

mitigate, transfer or actively manage the risks associated with increasing longevity among plan beneficiaries—received an Average Rating of 3.37.

> **Early Retirement Risk**—*We actively implement and regularly review the effectiveness of procedures to manage the impact of early retirement risk on the level and timing of future liabilities*—received an Average Rating of 3.30.

The low success rating for managing early retirement risk and longevity risk is not surprising given the low importance ascribed to these risk items by respondents. A significant contributing factor may be the absence of well-developed tools for understanding these risks. As more plan sponsors begin to understand the importance of addressing these longer term risks we should expect to see the corresponding success ratings improve in future surveys.

The low success rate for Decision Process Quality cannot so easily be explained simply by a low importance rating. This risk item ranked 12th overall in importance (see Table 2 above)—not a high priority but also not among the lowest. A more plausible explanation is that plan sponsors may not have the specialized knowledge to objectively assess the effectiveness of their decision-making processes. How to make better decisions under conditions of competing objectives, limited resources, and uncertain outcomes has been the subject of formal research for decades. This research and accumulated experience has led to the development of many practical methods to improve decision-making but these are generally unknown to plan sponsors. Given that the standard by which fiduciary prudence is

judged under ERISA is essentially one of ensuring thoughtful and consistent due diligence and adherence to internal process standards, this is an area where increased success should yield benefits for both plan sponsors and participants.

When applied to a risk item the *Average Success Rating* means the average of all ratings for that item across respondents who provided a rating.

Because of the reporting bias that we previously noted, the range of rating values is quite narrow with a small standard deviation. Therefore to provide a better indication of the difference in success levels across risk items we focused on the lower end of the rating scale and calculated a measurement called *Probability of Failure*. This is the number of risk items that received a rating of 1 or 2 expressed as a percentage of the total number of respondents who rated that risk item.⁶

Table 4 lists the *Average Success Rating* and *Probability of Failure* for each of the 18 risk items.

The Probability of Failure for Plan Governance is zero. This means that no respondent was prepared to say that oversight was less than independent, effective, and controlled in all areas and at all levels of their plan.

Disregarding that result, the ratio of the highest *Probability of Failure* (23.60% for Early Retirement Risk) to the lowest non-zero rate (1.82% for Advisor Risk) is 12.98. The average *Probability of Failure* for the bottom three least successfully managed risk items (20.53%) is 14 times the rate for the top three most successfully managed risk items (1.43%).

⁶ For example, in the case of Early Retirement Risk 161 out of 168 respondents provided a self-assessed rating. Of these 161 responses, 16 had a rating of 1 and 22 had a rating of 2, for a total of 38 respondents rating themselves either 1 or 2. We divide 38 by 161 to find the probability that a respondent gave a rating of 1 or 2 on this risk item. The result of 23.60% is defined as the *Probability of Failure* for early retirement risk.

Table 4: Average Success Ratings and Probability of Failure for 18 Risk Items

Risk Item	Success Rank	Average Success Rating	Probability of Failure
Asset Allocation	1	4.60	2.41%
Plan Governance	2	4.58	0.00%
Liability Measurement	3	4.51	1.88%
Advisor Risk	4	4.44	1.82%
Meeting Return Goals	5	4.35	4.19%
Investment Valuation	6	4.28	6.06%
Quality of Participant Data	7	4.26	4.38%
Accounting Impact	8	4.25	3.61%
Inappropriate Trading	9	4.22	7.88%
Underfunding of Liabilities	10	4.17	7.23%
Negative Alpha	11	4.04	9.64%
Fiduciary Risk and Litigation Exposure	12	3.98	6.71%
Mortality Risk	13	3.93	11.25%
Ability to Measure Risk	14	3.76	15.15%
Asset and Liability Mismatch	15	3.69	17.96%
Decision Process Quality	16	3.50	15.43%
Longevity Risk	17	3.37	22.56%
Early Retirement Risk	18	3.30	23.60%

Implications

Overall, the survey results show several inconsistencies that should highlight a future road map for plan managers. In particular, the reported relatively low success rating at managing decision process quality should be a cause for concern among plan sponsors. Under ERISA prudence standards, fiduciaries can incur personal financial liability if they fail to conduct a sufficiently high-quality decision-making process. Additionally there is a disconnect with regard to Plan Governance. While respondents ascribe a particularly high rating to the quality of their Plan Governance, they do not seem to carefully consider the effectiveness of their decision-making methods or how to improve the way

they make decisions. This suggests that many respondents don't perceive the decision-making process as an integral element of plan governance. In contrast, the 2006 DOL publication "Meeting Your Fiduciary Responsibilities" explicitly states that "[t]he duty to act prudently is one of a fiduciary's central responsibilities under ERISA.... Prudence focuses on the *process* for making fiduciary decisions" (emphasis in the original).⁷

This is increasingly reflected in ERISA litigation. In fact, according to the American Law Institute and the American Bar Association, "with the current turbulent economic climate and an aging 'baby boomer' population, ERISA litigation will explode." The organizations also recently noted that "fiduciary

⁷ "Meeting Your Fiduciary Responsibilities," United States Department of Labor, September 2006, p. 2.

Over time, a lack of holistic risk management may have repercussions, including potential plan failure, depressed earnings and volatility in earnings and/or cash flow.

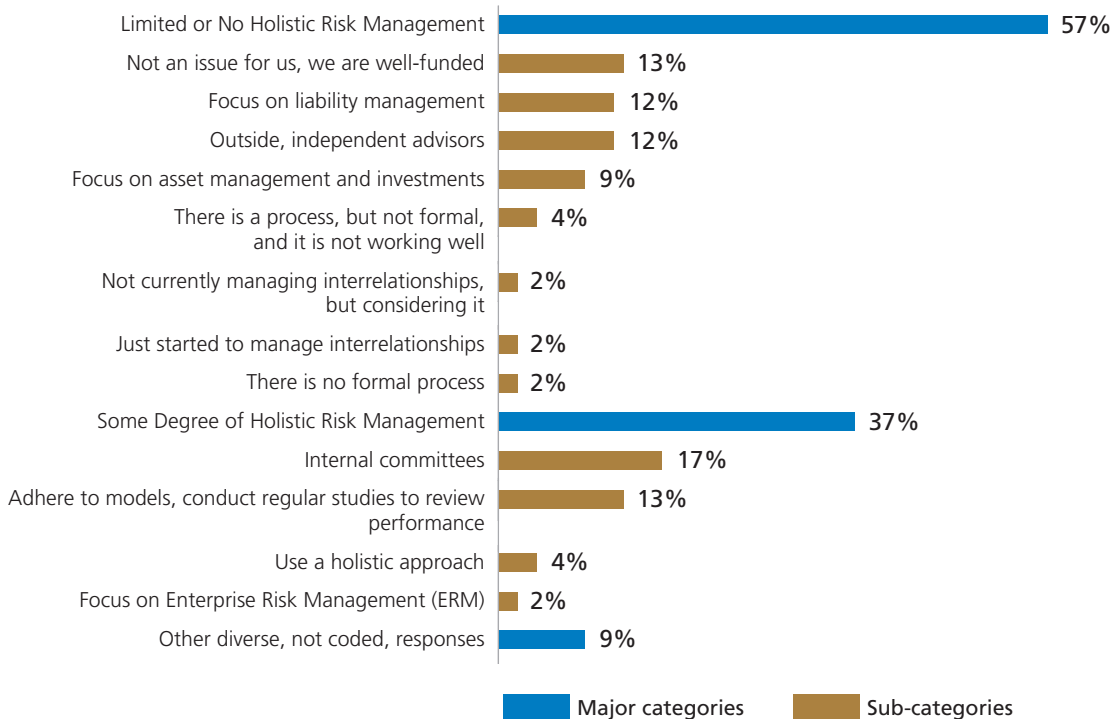
and disclosure obligations will surely undergo major transformation.”⁸ These organizations’ predictions have been manifested, for within the last two years there has already been either proposed or enacted extensive and explanatory disclosure of direct and indirect fees paid by plan sponsors under the Internal Revenue Code annual pension plan reporting requirements, as well as proposed DOL regulations mandating disclosures of compensation and conflicts of interest by plan service providers.

Plan sponsors also report that they routinely review liability valuations and understand the drivers that contribute to their plan’s liabilities. However, at the

same time, they indicate that they do not actively implement or regularly review procedures to manage either longevity risk or early retirement risk, both of which are major determinants of both the timing and level of future liabilities.

These inconsistencies may indicate that plan sponsors do not systematically consider the interrelationships among risk items and plan their implementation of risk management measures to maximize effectiveness across all items. Over time, a lack of holistic risk management may have repercussions, including potential plan failure, depressed earnings, and volatility in earnings and/or cash flow.

Chart 3: How Interrelationships Among Pension Investment Risk, Pension Liabilities, and General Risk Management Are Addressed



⁸ ALI-ABA Video Webcast, ERISA Litigation: The Bailout Bill, the Financial Crisis, and the Impact on Your Practice, October 23, 2008.

Pension Risk Importance and Success

INCONSISTENT RELATIONSHIP BETWEEN AGGREGATE RANKINGS

In the previous sections, we noted that plan sponsors rank Asset Allocation as the top risk item in terms of both importance and success. They also rank Early Retirement Risk as both least important and least well addressed. Beyond these two risk factors, however, there is no agreement between the importance that respondents ascribed to risk items and their relative success at managing them.

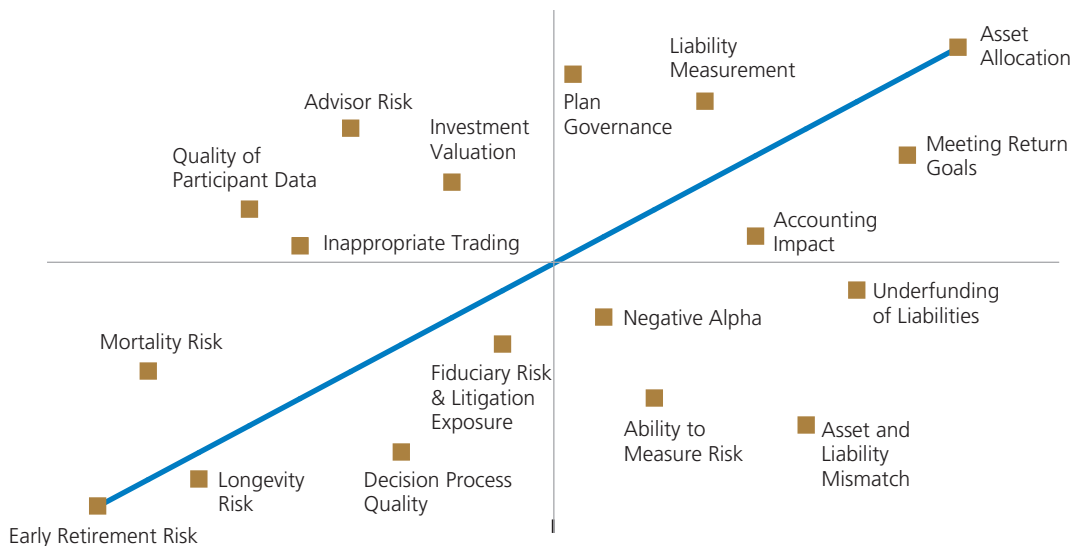
All other factors can be plotted against a quadrant matrix on importance and success. For example, high importance, low success risk factors include asset-liability mismatch, ability to measure risk, negative alpha, and underfunding of liabilities. Also interesting

is the basket of factors in the low importance, high success category: advisor risk, valuation risk, quality of participant data, and inappropriate trading.

Chart 4 shows a scatter plot of the Importance Rank and Success Rank for each risk item. The vertical and horizontal axes intersect at the midpoint of each ranking (equivalent to a value of 9.5). Ideally all risk items should be located along the line running through the bottom left quadrant (Low Importance Rank/Low Success Rank) and the top right quadrant (High Importance Rank/High Success Rank). The vertical distance from each point to the line represents the mismatch between the rankings. Unfortunately, only the two terminal points lie on the line and only a slight majority (10 of 18 risk items) fall cleanly within these preferred quadrants.

Chart 4: Consistency of "Importance" and "Success" Rankings

Risk items with the same importance and success rankings would lie along the diagonal blue line



There are still few comprehensive or clearly articulated standards and/or best practices for managing risk factors.

Implications

Gaps between Importance and Success may reflect the fact that despite new regulations and increased oversight, there are still few comprehensive or clearly articulated standards and/or best practices for managing risk factors. Terms such as “plan governance” and “quality of participant data” appear to mean very different things to individual plan sponsors—especially when it comes to implementation.

In some cases, gaps also underscore misalignment among economic, accounting, and actuarial perspectives. When risk management strategies are driven by an actuarial analysis, this analysis should be based on long-term economic assumptions, rather than short-term accounting measurements. One element influencing potential future financial reporting reforms is concern that too few plan sponsors are attempting to reconcile such gaps.

Looking more closely at the three risk factors with the highest gaps between Importance and Success scores, some interesting questions arise. Why, for instance, are plan sponsors placing such high importance on asset and liability mismatch but report relatively low success at accurately and successfully managing such mismatches? We believe there are a number of answers to this question. Among them:

- > **Market Forces:** Plan sponsors show that they understand the importance of matching assets and liabilities, but to do this successfully, they need long-duration assets. Unfortunately, the state of the marketplace makes these difficult to come by. In the current market environment,

there is a short supply of 30+ year bonds and, as a result, the existing supply is expensive. Relatively low level of interest rates also contributes to high cost of implementation. The traditional way to address the price and supply issues is to purchase derivatives/swaps, but the current credit environment has made this impractical as such contracts are expensive if available at all. As a result, many plan sponsors are sensitized to the issue but lack realistic solutions. Until a mindset change is in place that redefines investment success in terms of liabilities, any matched strategy may continue to appear expensive. Plan sponsors may be able to learn something from the insurance market in redefining results in terms of liability-adjusted returns. Today, this is far from a “mainstream” concept among pension managers.

- > **Plan Sponsor Objectives:** In short, plan sponsors are not in the business of running an investment company or assessing, pooling, and managing liability risks. Their goal is to sponsor employee benefits that increase retirement security and worker loyalty. As a result, even those who understand how to manage risks holistically may not be adequately equipped with enough information or have enough time to manage their plans in today’s challenging environment.

Until a mindset change is in place that redefines investment success in terms of liabilities, any matched strategy may continue to appear expensive.

In the quest to avoid volatility, plan sponsors have moved increasingly to transfer future investment risks to participants by moving to the Defined Contribution (“DC”) model and closing DB plans to new employees. This is despite the fact that studies show that DC plans are significantly more expensive than DB plans for a given level of retirement income benefits.⁹ These cost issues are also an expensive way to avoid volatility in contribution timing, even as DC plans themselves are undergoing rapid change—changes which many plan sponsors are struggling to address at the same time.

Why do plan sponsors rate advisor risk as relatively unimportant yet score themselves highly in terms of success? Again, there are many answers, among them:

- > **Strong Advisor Pool:** The high success score indicates that plan sponsors feel well-served by the investment consulting market. Despite losing internal expertise over the past few years—resulting from corporate downsizing and the reduction of full-time employees dedicated to plan oversight—most plan sponsors feel confident about the expertise they are getting from outside consultants.
- > **Fewer Internal Resources:** Still, plan sponsors have fiduciary responsibility for selecting, monitoring, and managing investment advisors. With fewer internal resources dedicated to plan management and oversight, sponsors may not be able to ask the hard questions required of them. Of course, a plan sponsor’s fiduciary responsibility doesn’t end when

A plan sponsor’s fiduciary responsibility doesn’t end when they pick an advisor. ERISA fiduciary rules demand that plan sponsors oversee the actions of an advisor and, if they fail to do so, there are potential ERISA consequences to shirking this responsibility.

they pick an advisor. ERISA fiduciary rules demand that plan sponsors oversee the actions of an advisor and, if they fail to do so, there are potential ERISA consequences to shirking this responsibility. Again, sponsors may not be able to dedicate enough time to exploring all of the issues necessary to pick the most appropriate advisor for their plan.

From an advisor’s perspective, there seems to be an emerging trend of more lawsuits that involve actuaries and advisors. This is a rather complex area but important to mention that service provider risk (i.e., delegation to third parties vs. oversight) is real.

TWO-THIRDS OF PLAN SPONSORS PERCEIVE THEY ARE NOT SUCCESSFULLY MANAGING MOST IMPORTANT RISKS

The low scores self-reported by many of the respondents indicate that a significant percentage of plan sponsors who believe they know the big risk areas don’t/can’t successfully address them. Whatever the cause, a large number of plan executives are not taking action on the risks they view as most important.

Three different measurements were used to determine the consistency with which individual respondents are successfully managing the risks to which they are giving the greatest attention.

These are the following:

- > **Importance-Weighted Average Rating:**¹⁰ This weighted-average rating can range from 1 to 5,

⁹ “A Better Bang for the Buck: The Economic Efficiencies of Defined Benefit Pension Plans”: this report by the National Institute on Retirement Security (NIRS) concludes that a defined benefit (DB) pension can deliver the same retirement income at 46% lower cost than an individual defined contribution (DC) account, August 2008.

¹⁰ This is obtained by multiplying the rating assigned to each risk item in section 1 of the survey by its *Share of Importance* and then summing the results.

105 respondents (69%) failed at least one of the three tests for consistency between the levels of importance and success they ascribed to managing key pension risks.

and indicates the extent to which risk items that receive the most attention from respondents also received a high rating for success in implementing comprehensive risk management measures. Ideally every risk item that has a positive Importance Selection Rate should have a success rating of 4 or 5 so that the weighted average rating would be in excess of 4.50.

- > Ratio of the *Importance-Weighted Average Rating* to the simple un-weighted *Average Rating*: Expressed as a percentage, if a respondent has a higher success rating on the more important risk items, this ratio should be greater than 100%. This controls for overall rating bias.
- > *Consistency Rate*: This is the percentage of risk items that combine either above average

importance with above average success or below average importance with below average success. Either combination indicates consistency between importance and success. A result below 50% would indicate significant inconsistency.

Table 5 shows summary results for the three measurements. The median results for both the ratio of Weighted to Unweighted Average Ratings and the Consistency Rate indicate that more than 50% of all respondents met the test thresholds of 100% and 50% respectively. However, of the 153 respondents who provided complete ratings 105 or 69% failed at least one test and 23 or 15% failed all three of the tests for consistency. Only 48 out of the 153 respondents or 31% passed all three consistency tests.

Table 5: Results of Three Tests for Consistency Between Importance and Success

Test Measurement	Number of Respondents	Percentage of Respondents
Test 1: Importance-Weighted Average Rating < 4.50	96	63%
Test 2: Ratio of Average Ratings < 100%	41	27%
Test 3: Consistency Rate < 50%	41	27%
Failed All Three	23	15%

	Maximum	Median	Minimum
Importance-Weighted Average Rating	5.00	4.39	2.47
Ratio of Average Weightings	145%	104%	56%
Consistency Rate	94%	56%	28%

Qualitative Interviews: Overview

To assess how the changing legal, market, and regulatory environment were impacting DB pension plans, MetLife complemented its quantitative research with a series of in-depth qualitative plan sponsor interviews. The interviews allowed for additional insight into the pension risk management practices and behavior of various organizations. Qualitative discussion provides additional depth in three key areas: Plan Oversight Structure, Asset-Liability Management, and Risk Management and Controls.

OVERSIGHT STRUCTURES VARY CONSIDERABLY

Consistent with quantitative survey results, no single model seemed to prevail with respect to pension governance structures, use of outside parties and job titles of persons tasked to analysis and oversight responsibilities. There is a wide variety of titles represented on the investment committees including, but not limited to, CEO, CFO, Head of Human Resources, Director of Benefits, Head of Legal, Investor Relations, Treasurer, plan participants and/or internal accounting staff. Many such committees meet quarterly and, in some cases, are provided more frequent information about the financial health of a particular plan(s). In one case, there are three named fiduciaries but no committee. In other situations, interviewees state that investment committee members tend to self-identify as plan fiduciaries.

To assess how the changing legal, market, and regulatory environment were impacting DB pension plans, MetLife complemented its quantitative research with a series of in-depth qualitative plan sponsor interviews.

Fiduciary status is not automatic for external service providers such as actuaries and pension consultants. In one example, an external consulting firm was retained for purposes of customizing a target date product wherein that third party is deemed a fiduciary to the plan. In another case, a consulting firm provides actuarial services to a plan sponsor and is not classified as a plan fiduciary. Some indicated that they are revisiting the issue of third party providers and their functional fiduciary duties to the plan, if any, and others referenced the “fine line” between advice and information they receive from service providers. Yet another respondent described external asset managers as fiduciaries who are “told to stay within certain parameters.”

ASSET-LIABILITY MANAGEMENT: DIFFERENT PROBLEMS, DIFFERENT SOLUTIONS

Here too, variation was a constant. Not surprisingly, asset-liability management strategies are influenced

Consistent with quantitative survey results, no single model seemed to prevail with respect to pension governance structures, use of outside parties and job titles of persons tasked to analysis and oversight responsibilities.

Fiduciary status is not automatic for external service providers such as actuaries and pension consultants.

by prevailing rules and regulations such as FAS 158 and the Pension Protection Act of 2006. Existing funding status and whether a plan has been frozen are other considerations. Concerns expressed varied, including investment allocation appropriateness, the impact of increased disclosure and the degree to which duration should be balanced with portfolio efficiency. One interviewee expressed a concern about under-allocation to equity, adding that the company is “looking more seriously at duration-matching some of its portfolio with bonds.” This same company seeks to maintain funding status at around 100% since “small changes in interest rates, even when performance is good, can increase the DB liability significantly.” A second interviewee expressed concern about onerous reporting requirements due to the passage of the Pension Protection Act of 2006 with the net result that few financial statement users are better off with more disclosure. A third person emphasizes the sponsor’s focus on duration matching as a way to “minimize asset-liability management volatility,” even if it means “veering away from a mean-variance efficient portfolio.” While the company realizes they “will never quite earn their cost of capital” from pension assets, they allocate 70% to equities so they will “not have to report a lower expected asset return.”

Regarding plan design, several companies expressed concern about the pressures to partially freeze

or completely eliminate traditional plan benefits. One interviewee, a treasury professional, states a preference for the traditional DB plan as a way to attract productive workers and avoid putting undue pressure on participants who may not feel comfortable making personal investment decisions. At the same time, his colleagues in Human Resources advocate for portable benefits to accommodate younger and/or more mobile workers. Company stock in their 401(k) plan “keeps their lawyers up at night.” Another interviewee talked about the importance of workforce retention, adding that all of the sponsor’s plans are open “except when regulations or particular situations mandate the freezing of a plan because actives were transferred into new plans.”

Several interviewees describe their foray into alternatives such as hedge funds, private equity, real estate, and infrastructure. One person describes current research about how best the pension plan can “take advantage of dislocation in the credit markets.” He opines that many consultants “do not understand risk management and valuation

Qualitative discussion provides additional depth in three key areas: Plan Oversight Structure, Asset-Liability Management, and Risk Management and Controls.

issues associated with 'complex' hedge fund trades, resulting in the recommendation of a fund of funds strategy." In his view, "most hedge fund managers do not have a good risk management action plan."

Several respondents cited recessionary pressures and/or market volatility as concerns. One person laments that corporate plans are excessively regulated at the same time that public plans operate within a "weaker regulatory environment." Should state and municipal plans take a hit, this interviewee believes that corporate pension plans will pay the price.

RISK MEASUREMENT AND CONTROL: UNDER CONSTRUCTION

Formal risk management initiatives are underway at several of the companies represented by qualitative interviewees. In one case, the investment committee is described as evaluating the relationship between pension risks as they impact corporate financial health, acknowledging that "shareholders are ultimately on the hook to make good on the plan." While this sponsor has no specific risk management policy statement, they address risk by asset class and plan to hire a Chief Risk Officer soon. They initially looked at Liability-Driven Investing ("LDI") strategies with disdain but may give them a second look, especially given a philosophy that a DB plan should not invest in equities. A second interviewee cites

standard deviation of returns as a primary measure of volatility, adding that the investment committee is "considering the use of tracking error but not sure which exact way to go. Variation in the net unfunded position of the plan is a possible metric though the company's pension management process is a 'work in progress'." When evaluating managers, they examine deviations against prespecified benchmarks.

In contrast, other plans utilize Monte Carlo simulations, pure immunization and global asset-liability management uniformity as risk control tactics. One company is evaluating LDI but "is not there yet," as they struggle with whether to allocate less to stocks and decide on how best to benchmark LDI managers. Their solution may be to focus on funding status instead of return deviations vis-à-vis identified benchmarks. Alternatively, managers might be best evaluated against a weighted fixed income combination of the Lehman Aggregate Index and a longer duration benchmark for example. Another interviewee describes an ongoing consideration of LDI for one-third of the plan's assets, subject to

Formal risk management initiatives are underway at several of the companies represented by qualitative interviewees.

figuring out how to deal with spikes in when and how many people retire at a given time. Actuarial input suggests that the spikes themselves vary, making it difficult to identify an ideal LDI strategy. This same respondent would like to see more attention paid to improving the accuracy of mortality assumptions. He adds that “even the actuaries don’t seem to be focusing much on longevity risk.”

One interviewee describes latitude awarded to external money managers with respect to the use of derivatives for purposes of taking a long-term view. The use of derivatives as part of a short-term overlay strategy is prohibited. This company looked at LDI but opted instead to invest in equities and alternatives. They are willing to accept market volatility in exchange for a positive equity risk premium and a positive alpha potential associated with alternative investments. Their current allocation mix has alternatives accounting for approximately 15% of the portfolio though they are allowed to invest as much as 20% to 25% in alternatives. Stronger earnings for this particular company have resulted in a proportionally lower amount of monies dedicated to alternatives. The trustee and custodian independently vet the public managers’ valuation numbers. For alternatives, they use what the manager provides.

Study Methodology

As part of this comprehensive quantitative and qualitative research, Greenwich Associates conducted telephone interviews with 168 corporate plan sponsors during the period June through August 2008. The respondents consisted primarily of executives responsible for pension investments, risk management or employee benefits, in addition to senior corporate management. Table 6 provides a breakdown of the respondent companies by DB asset size.

The survey addressed 18 different investment, liability, or business risks faced by DB plan sponsors. These risks were identified by a panel of industry experts and researchers, including Bdellium Inc.,

Greenwich Associates, and Pension Governance, Incorporated. Each risk item had associated with it a statement describing comprehensive measures for successfully managing that particular risk. In addition the survey included three open-ended questions. The 18 risk items, associated risk management statements and open-ended questions are reproduced in Appendix A.

The survey questions were divided into two sections. In the first section each respondent was asked to indicate on a five-point rating scale how strongly they agreed or disagreed with each of the 18 risk management statements. A score of 1 indicated strong disagreement, a score of 2 indicated some

Chart 6: Distribution of Respondents by Plan Asset Size

Total Number of Respondents = 168

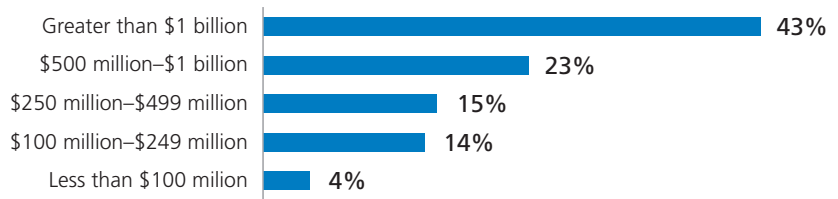


Table 6: Number of Respondents by DB

DB Plan Asset Size	Respondents
Greater than \$1 billion	73
\$500 million-\$1 billion	39
\$250-\$499 million	26
\$100-\$249 million	23
Less than \$100 million	7
Total:	168

disagreement, a score of 3 neither agreement nor disagreement, a score of 4 indicated some agreement, and a score of 5 indicated strong agreement. The order in which the 18 statements were presented to the respondents was rotated across the 168 interviews.

The extent to which a respondent agreed or disagreed with the statements in Section 1 of the survey was interpreted as an indication of how successful or unsuccessful they are at implementing the risk management measures described.

In the second section of the survey each respondent was presented with a list consisting of 4 of the 18 risk items and asked to indicate the risk item to which they pay the most attention. This was repeated a total of 18 times with each respondent. Each time the choice set presented a different combination of risk items. The number of choice sets, the risk items included in each set and the ordering of those risk items was designed to optimize survey design qualities such as frequency, orthogonality, connectivity, and positional balance.

The proportion of times each item was selected was interpreted as an indication of the importance the respondent ascribed to successfully managing that risk item.

The survey responses were analyzed using a number of specially designed measurements, each of which is described in the Glossary at Appendix B of this report.

Conclusion

Over the past decade, there has been a well-documented trend away from defined benefit pension plans in favor of defined contribution plans as the qualified retirement plan “chassis” for the future. The trend away from traditional pension plans has, in part, been driven by a desire to reduce a company’s financial risk—a risk that can be challenging to manage because the financial requirements of the plan are subject to many complex assumptions. For those companies for whom defined benefit plans continue to be a core element of their retirement programs, some are closing the plans to new workers, ending or limiting current workers’ accrual of benefits or, in some instances, they are doing both as they have come to understand what being in the “pension business” means once their number of retirees begins to rise.

Today, employer-sponsored defined benefit pension plans are under unprecedented pressure. While the Pension Protection Act ushered in a new era of discipline and transparency for defined benefit plans, it has also made management of the plans more complex in some respects. Add to the equation the current economic conditions, including the tightening of the capital and credit markets, coupled with the impact of recent demographic trends, such as the wave of baby boomers approaching retirement, and one can see why effective defined benefit plan risk management is moving from being important to imperative.

The MetLife U.S. Pension Risk Behavior IndexSM was designed to underscore the importance of having a strategic understanding of defined benefit pension plan risks and the interconnectivity between the risks. By developing a better framework for reviewing risk holistically, plan sponsors can strive to better manage such risks as they work to keep the promise of a secure retirement for plan participants.

Appendix A

CALCULATING THE PENSION RISK BEHAVIOR INDEX (PRBI)

> **Step 1:** Calculate an average success rating for each respondent that incorporates the plan sponsor's self-reported success at managing each of 18 risks, weighted by the relative importance that sponsor ascribed to each risk.

In Section 1 of the survey each respondent provided a self-assessment of how successfully they are managing each of 18 different investment, liability,

and business risks. This assessment took the form of a rating on a scale from 1 to 5, with 5 indicating the highest level of perceived risk management success.

The importance-weighting is derived from responses to Section 2 of the survey. We firstly calculate each risk item's *Importance Selection Rate*. This is the number of times each risk item was selected by the respondent as receiving most attention, expressed as a percentage of the number of times it was included in all the choice sets that were shown to

Table 7: Example of the Calculations Used in Step 1 of PRBI Construction

Row #	Description					
1	Risk Item Number:	1	2	3	4	5
2	Success Rating for each risk item (directly from Section 1 of survey)	1	3	5	4	5
3	Number of times risk item was included in choice sets shown to the respondent:	4	4	4	4	4
4	Number of times respondent selected risk item as most important within a choice set:	1	0	2	2	3
5	Selection Rate for each risk item (row 4 divided by row 3)	0.25	0.00	0.50	0.50	0.75
6	Sum of Selection Rates across all risk items (add the values in row 5 for risk items 1 through 5)	2.00				
7	Share of Importance (each value in row 5 divided by the total in row 6)	0.125	0.00	0.25	0.25	0.375
8	Multiply each value in row 2 by its corresponding value in row 7	0.125	0.00	1.25	1.00	1.875
9	Importance-Weighted Average Rating (sum of the values in row 8 for risk items 1 through 5)	4.25				

that respondent. Each *Importance Selection Rate* can range from 0% to 100% and their sum across all 18 risk items can therefore range from 0% to 1800%. Next we divide each *Importance Selection Rate* by the sum of all Selection Rates for that respondent. We call the resulting value a risk item's *Share of Importance*. The total *Share of Importance* across all risk items always equals 100%. Furthermore, if each risk item is considered equally important the *Share of Importance* for each item would be the same and would equal $1/n$, where n is the total number of risk items. (In the case of this survey, $n = 18$ and each risk item's *Share of Importance* would equal $1/18$ or 5.56%).

We then multiply the success rating a respondent gave to each risk by its corresponding *Share of Importance* and sum the results across all 18 risk items. We call this number the respondent's *Importance-Weighted Average Rating*.

This value will range from 1 to 5. A value of 1 or 2 indicates that important risks are not being successfully managed. A value of 3 indicates that the plan sponsor is neither particularly successful nor unsuccessful at managing important risks. Values of 4 or 5 indicate successful management of important risk items.

Table 7 illustrates how an *Importance-Weighted Average Rating* is calculated for a survey respondent, assuming that the survey addressed five risk items.

- > **Step 2:** Aggregate the results across all plan sponsors by calculating an industry average success rating. The contribution of each individual respondent's result to the industry average is weighted by the relative asset size of their DB plan(s).

To calculate the industry average success rating we multiply each respondent's *Importance-Weighted Average Weighting* (obtained in Step 1) by the relative size of their DB assets and sum the results across all respondents.

To calculate the relative size of each respondent's DB assets we divide total assets in their DB plan(s) by the aggregate of DB assets in the plans of all respondents.

Table 8 illustrates how the industry average success rating is calculated, assuming that the survey had 5 respondents.

- > **Step 3:** Convert the industry average success rating into the final index value.

The rating results obtained in both Step 1 and Step 2 are on an arbitrary scale of 1 to 5.

The final index value takes the industry average success rating and converts it into its corresponding value on a standardized scale from zero to 100.

In order to standardize the rating we subtract 1 from the raw value and multiply the result by 25. This provides the final MetLife Pension Risk Behavior Index (PRBI) value.

CALCULATING RISK IMPORTANCE CONCENTRATION:

Risk Importance Concentration measures the extent to which a plan sponsor is overly concentrating on a relatively small number of risk items rather than paying attention to the full range of risks. This measurement takes account of both the number of risk items and the relative level of importance

Table 8: Example of the Calculations Used in Step 2 of PRBI Construction

Row #	Description	A	B	C	D	E
1	Respondent ID:					
2	Importance-Weighted Average Rating (calculated from Step 1 for each respondent)	4.25	3.94	2.75	4.78	3.09
3	Total assets in each respondent's DB plan(s) (\$ millions)	728	12,840	232	5,885	164
4	Total DB assets in the plans of all respondents (sum the values in row 3 for respondents A through E)	\$19,849 million				
5	Relative DB asset size (each value in row 3 divided by the total in row 4)	0.037	0.647	0.012	0.296	0.008
6	Multiply each value in row 2 by its corresponding value in row 5	0.156	2.549	0.032	1.417	0.026
7	Industry Average Success Rating (sum of the values in row 6 for respondents A through E)	4.179				

Table 9: Example of the Calculations Used in Step 3 of PRBI Construction

Row #	Description	
1	Industry Average Success Rate (calculated from Step 2)	4.179
2	Subtract 1 from the value in row 1	3.179
3	MetLife Pension Risk Behavior Index (PRBI) value (multiply the value in row 2 by 25)	79

ascribed to each. The *Risk Importance Concentration* value equals 0.00% if equal importance is attributed to all 18 risk items and equals 100.00% if all importance is being ascribed to just one risk item.

Risk Importance Concentration is based on the Herfindahl-Hirschman Index, a well-established measurement of market concentration used by U.S. regulators to determine the competitive effect

of proposed corporate mergers. The Herfindahl-Hirschman Index is equal to the sum of the squared market shares of the firms in an industry. The *Risk Importance Concentration* value used in this study is the standardized reciprocal of the Herfindahl-Hirschman Index where a weighting called *Share of Importance* replaces the usual market share weighting in the original Herfindahl-Hirschman calculation.¹¹

¹¹ The idea and approach to use the inverse of the Herfindahl-Hirschman Index is a result of seeing such inverse approach applied in a research study by the Brandes Institute in conjunction with global wealth allocation. *Concentrated Portfolios: An Examination of Their Characteristics and Effectiveness*, The Brandes Institute, September 2004. It should be noted that the issues considered in the PRBI study are different and completely unrelated to the issues in the noted study by the Brandes Institute.

Table 10: Example of How to Calculate Risk Importance Concentration

Row #	Description					
1	Risk Item Number:	1	2	3	4	5
2	Number of times risk item was included in choice sets shown to the respondent:	4	4	4	4	4
3	Number of times respondent selected risk item as most important within a choice set:	1	0	2	2	3
4	Selection Rate for each risk item (row 3 divided by row 2):	0.25	0.00	0.50	0.50	0.75
5	Sum of Importance Selection Rates across all risk items (add the values in row 4 for risk items 1 through 5):	0.89				
6	Share of Importance (each value in row 4 divided by the total value in row 5):	0.06	0.00	0.25	0.25	0.56
7	Equal Weight Equivalent (square each value in row 6, sum the results and take the reciprocal):	3.56	2.549	0.032	1.417	0.026
8	Risk Importance Concentration (subtract the value in row 7 from 18 and divide the result by 17):	85%				

Risk Importance Concentration is derived from responses to Section 2 of the survey. We first calculate each risk item's *Importance Selection Rate*. This is the number of times each risk item was selected by the respondent as receiving most attention, expressed as a percentage of the number of times it was included in all the choice sets that were shown to that respondent. Each *Importance Selection Rate* can range from 0% to 100% and their sum across all 18 risk items can therefore range from 0% to 1800%.

We then divide the *Importance Selection Rate* for each risk item by the total *Importance Selection Rate* for all 18 risk items. We call the resulting value a risk item's *Share of Importance*. The total *Share of Importance* across all risk items always equals 100%. Furthermore, if each risk item is considered equally important the *Share of Importance* for each item would be the same and would equal $1/n$, where

n is the total number of risk items. (In the case of this survey, $n = 18$ and each risk item's *Share of Importance* would equal $1/18$ or 5.56%).

Next we square each *Share of Importance*, sum the results and take the reciprocal. This provides a single number (which we call an *Equal Weight Equivalent* or EWE) that expresses the actual distribution of *Importance Selection Rates* across the 18 risk items as an equivalent number of items, assuming each had an equal importance. In general, this value can range from 1 to n , where n is the total number of risk items. As a final step, we therefore standardize this value to make it independent of the number of risk items. The standardized *Risk Importance Concentration* value equals the total number of risk items minus the EWE value, expressed as a percentage of the total number of risk items minus one.

Appendix B

COMPLETE LIST OF RISK ITEMS, ASSOCIATED RISK MANAGEMENT STATEMENTS AND OPEN-ENDED QUESTIONS

Risk Item	Risk Management Statement
Question Block 1: Investment Risks	
Ability to Measure Risk	We routinely use analytical tools that allow us to measure the level, volatility, correlation, and effects of multiple risk factors at the portfolio level and within and across managers, investment styles and asset classes.
Inappropriate Trading	We have designed and proactively reviewed compliance with clear investment guidelines for all investment managers to avoid inappropriate use of leverage, shorting, illiquid instruments, inadequate collateral, or other risk exposures to boost investment returns.
Asset Allocation	We use disciplined rebalancing to implement a documented strategic asset allocation policy.
Negative Alpha	We have policies to determine whether we index or retain active managers and, to the extent we retain active managers, we have processes for systematically measuring and enforcing performance standards.
Meeting Return Goals	We have policies and procedures in place to determine our return goals, to identify the reasons for any deviation between actual results and goals and to take appropriate action in a timely manner.
Question Block 2: Liability Risks	
Asset and Liability Mismatch	We carry out regular studies that have proven accurate and effective in managing mismatches between the duration of plan assets and liabilities.
Underfunding of Liabilities	The design and execution of our investment strategies have proven effective in comfortably managing our funding contribution levels.
Mortality Risk	We have modeled and understand how the expected mortality of our participants affects our plan cash flows.
Longevity Risk	We implement and regularly review the effectiveness of procedures to mitigate, transfer or actively manage the risks associated with increasing longevity among plan beneficiaries.

Early Retirement Risk	We actively implement and regularly review the effectiveness of procedures to manage the impact of early retirement risk on the level and timing of future liabilities.
Quality of Participant Data	We implement a procedure to ensure that census information on plan participants is correct and complete.

Question Block 3: Business Risks

Plan Governance	Those responsible for plan governance exercise effective, independent oversight, supported by internal controls within all areas and at all levels of plan management.
Advisor Risk	Plan trustees and internal plan managers have sufficient knowledge, experience, and training to assess the quality of advice and the effectiveness of services provided by third parties.
Accounting Impact	We are able to forecast and we regularly monitor the impact on the sponsor's balance sheet, income statement and cash flow of fluctuations in pension assets and liabilities.
Fiduciary Risk and Litigation Exposure	We explicitly manage fiduciary risk and related litigation exposure based on careful monitoring of litigation trends, including claims, costs, and decisions.
Investment Valuation	The procedures used for valuing all plan investments, including any non-investments or any illiquid or complicated positions such as derivatives, hedge funds, or private equity are clearly documented, periodically reviewed, and systematically monitored.
Liability Measurement	We routinely review liability valuations and understand the drivers that contribute to our plan's liabilities.
Decision Process Quality	We periodically assess the effectiveness of our decision-making processes by explicitly considering the links between the way in which we make decisions and the outcomes of those decisions.

Open-Ended Questions

Question A	How do you determine your return goals?
Question B	How do you manage the interrelationships among pension investment risk, pension liabilities, and general enterprise risk management?
Question C	Which external forces are having the biggest impact on your plan(s)?

Appendix C

GLOSSARY OF TERMS

Throughout this report, MetLife worked with our research partners to analyze and interpret plan sponsor responses. What follows is an alphabetized list of the measurements we used, together with a definition for each.

<i>Average Success Rating:</i>	When applied to a risk item this means the average of all ratings for that item across respondents who provided a rating. When applied to a respondent this means the average rating across all risk items to which that respondent assigned a rating. The rating scale is from 1 to 5 reflecting the degree to which each respondent disagreed (1 or 2), was neutral (3), or agreed (4 or 5) that they are successfully implementing certain risk management measures.
<i>Risk Importance Concentration:</i>	When applied to a risk item this measurement indicates the extent to which a disproportionate importance is being ascribed to just a few risk items. The concentration factor equals (the number of risk items <i>minus</i> EWE value)/(number of risk items <i>minus</i> 1), expressed as a percentage. The <i>Concentration Factor</i> can range from 0% to 100%. A value of 0% would indicate that all risk areas are being ascribed equal importance (no concentration). A value of 100% would indicate all importance being placed on just one risk area (total concentration). See Appendix A for a full explanation and worked example of how this measurement is calculated.
<i>Consistency Rate:</i>	This is the percentage of risk items that combine either above average importance with above average success or below average importance with below average success. Either combination indicates consistency between importance and success. This is a broad measurement of consistency that controls for any bias in the underlying ratings. A result below 50% would indicate significant inconsistency.
<i>Importance-Weighted Average Rating:</i>	In respect of each respondent, multiply the rating assigned to each risk item in Section 1 of the survey by its <i>Share of Importance</i> and total the results. This weighted average rating can range from 1 to 5. It indicates the extent to which risk items that receive the most attention from respondents also received a high rating for success in implementing comprehensive risk management measures.

<p><i>Probability of Failure:</i></p>	<p>In respect of a risk item, this is the number of plan sponsors who gave the risk item a rating of 1 or 2, expressed as a percentage of the total number of respondents who rated that risk item. In respect of a respondent it is the number of risk items to which that respondent assigned a rating of 1 or 2, expressed as a percentage of the total number of risk items to which the respondent assigned a rating.</p>
<p><i>Ratio of Weighted to Unweighted Average Success Rating:</i></p>	<p>This is the ratio of the Average Rating to the <i>Importance Weighted Average Rating</i>, expressed as a percentage. A ratio close to 100% indicates that the respondent was successfully implementing risk management measures in respect of items that were deemed important. A ratio close to 0% indicates that the respondent was not successful in implementing risk management measures in respect of risk items that were receiving the most attention. This ratio measures consistency between success and importance while controlling for any general upward or downward bias in the scores assigned by each respondent in the Section 1 of the survey.</p>
<p><i>Importance Selection Rate:</i></p>	<p>The number of times each risk item was selected in Section 2 of the survey as receiving most attention, expressed as a percentage of the number of times it was included in the choice sets.</p>
<p><i>Share of Importance:</i></p>	<p>Each risk item's <i>Share of Importance</i> equals its <i>Importance Selection Rate</i> divided by the sum of the <i>Importance Selection Rates</i> for all risk items. The result is a percentage value between 0.00% and 100.00% and provides a standardized relative importance of each risk item compared to the other risk items. The sum of the <i>Share of Importance</i> values for all risk items always equals 100.00%.</p>



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