MetLife

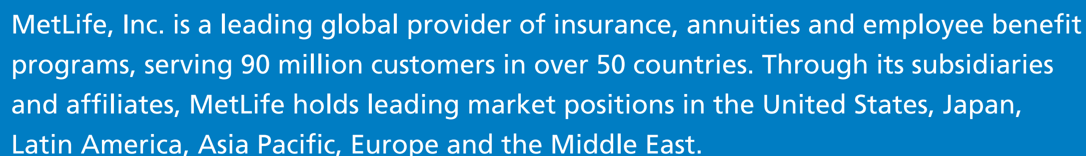
MetLife U.S. Pension Risk Behavior Index℠

13

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

JUNE 2013

About MetLife



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The MetLife enterprise serves 90 of the top 100 FORTUNE 500®-ranked companies[1] and has $837 billion in total assets and $772 billion in liabilities.[2] The operating companies, Metropolitan Life Insurance Company and MetLife Insurance Company of Connecticut, have $424 billion in total assets and $405 billion in liabilities.[3] These operating companies manage $83 billion of group annuity assets[4] and $37 billion of transferred pension liabilities.[4] The company also has a more than 35-year track record in stable value with $46 billion of stable value business,[4] and has $23 billion of nonqualified benefit funding assets.[4]

[1] FORTUNE 500® is a registered trademark of the FORTUNE magazine division of Time Inc.

[2] MetLife, Inc. as of December 31, 2012. Total assets include general account and separate account assets and are reported under accounting principles generally accepted in the United States.

[3] Metropolitan Life Insurance Company and MetLife Insurance Company of Connecticut as of December 31, 2012. Total assets include general account and separate account assets and are reported on a statutory basis.

[4] As of December 31, 2012.

ABOUT THE RESEARCH PARTNERS

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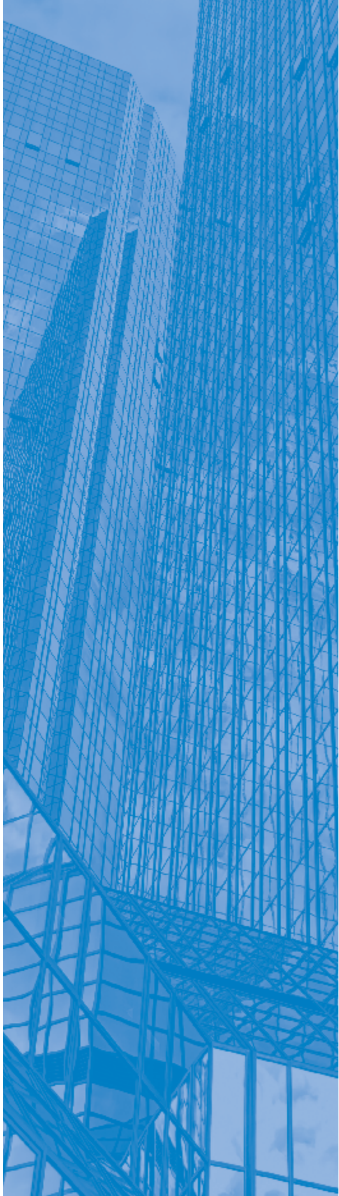
Bdellium Inc. helps retirement plan sponsors, institutional investors and fund managers to reduce risk and improve performance by implementing better decision-making processes. Bdellium offers clients deep industry knowledge supported by strategic planning and operational management experience, advanced 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 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.

Foreword



Five years. That's how long MetLife has been tracking pension risk management trends and developments among sponsors of the largest U.S. defined benefit (DB) pension plans. Introduced in 2009, our U.S. Pension Risk Behavior Index℠ (U.S. PRBI) study surveys plan sponsors and measures their aptitude for managing – and attitudes about – the investment, liability and business risks to which their DB plans are exposed. The study consists 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. Every year, we also include a series of open-ended questions which allow us to hear from plan sponsors, in their own words, about the pension-related issues that keep them up at night.

MetLife designed and fielded the first U.S. PRBI study five years ago to encourage public dialogue around pension risk-related issues for plan fiduciaries. Since the study was introduced, it has helped plan sponsors develop a new framework for understanding pension risk management and identify early warning signs of pension risk management gaps. As you will see outlined in this report, it has also helped plan sponsors prepare for – and take decisive action to mitigate – pension risk in ways that would not have been possible without a new framework for thinking about pension management and risk.

Since the inaugural U.S. PRBI study was published, the annual MetLife study has chronicled the evolution of how plan sponsors view and address 18 risk factors affecting their DB pension plans. Highlights of each year's major findings are outlined below:

- In 2009,[5] the study found that plan sponsors were almost exclusively focused on the asset side of the asset-liability equation.
- A year later, as the economy was struggling, the 2010 study reported that, in the course of just one year, plan sponsors were open to a potential reconsideration of the importance of all risks, placing nearly equal importance on all of them.

[5] References throughout the report to previous years' studies refer to the year in which prior studies were released.

- The 2011 study found that, as the economy started to stabilize, plan sponsors were showing signs of differentiating among the risk factors, focusing on a smaller number of risk factors and paying greater attention to them. Furthermore, sponsors were beginning to look at assets in the context of liabilities.
- The 2012 study indicated that, rather than returning to the asset-centric, total rate of return focus seen in the inaugural study, a more balanced focus on assets and liabilities had continued and deepened, suggesting that a new trend might be taking hold. In addition, the study found a greater concentration on fewer risk items, higher perceived success in managing risks overall, and more consistency in the management of the pension risks that are deemed most important.

On the following pages are the 2013 study's findings, which shed light on the confluence of forces that has increased plan sponsors' awareness of the nature and inter-relationship of the risks associated with their plans. Although equity markets have rebounded and the Dow Jones Industrial Average has recently reached a record high, plan sponsors are still grappling with how best to maintain minimum funding levels[6] at a time when pension benefit obligations are climbing. This is due, in large part, to the persistently low interest rate environment that has resulted from U.S. monetary policy intended to support the post-recession economy. Market and regulatory uncertainty are also factoring into their decision-making processes.

Despite these headwinds, plan sponsors have a new mindset. Today, most are fully engaged in the active management of their pension risks. In a word, "de-risking" may be the best way to describe the manner in which plan sponsors are managing these risks, which is quite a stark contrast with 2009. This newfound focus, which allows companies to address their pension obligations while focusing on their core businesses, is expected to be in the mind's eye of plan sponsors for the foreseeable future and provides the foundation necessary to manage plans and mitigate their risks effectively in the years to come.

[6] Although the Pension Relief Act of 2010 allows plan sponsors to elect to extend the shortfall amortization from the seven years required under the Pension Protection Act (PPA) to either nine years or 15 years, with some restrictions, employers faced potentially larger funding obligations as the PPA provisions continue to be phased in during 2012.

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Executive Summary

HIGHEST INDEX VALUE TO DATE

What a difference a quinquennium can make. Five years after MetLife released its inaugural U.S. Pension Risk Behavior Index in 2009, plan sponsors for the largest U.S. defined benefit (DB) pension plans believe they are more successfully managing the most important risks affecting their plans than at any other point since the financial crisis. Our latest study reveals that an Index value[7] of 87 has been achieved this year, which is the highest in the history of the U.S. PRBI. The Index effectively measures both attitudes toward, and aptitude for managing, pension plan risks by calibrating the importance that DB plans sponsors ascribed to managing each risk affecting plan, their reported success at implementing comprehensive practices to manage each risk and the consistency between the two. Researchers often shy away from making predictions about the future, but – somewhat presciently – the research team for the first U.S. PRBI study stated in the inaugural report that, while it is "unrealistic to expect to achieve an Index value of 100, a target of 87 would not be unreasonable."

This year's findings are in stark contrast to 2009, when the first U.S. PRBI was released. In the original study, we reported that most plan sponsors were not yet comprehensively and systematically managing the risks faced by their DB pension plans. In fact, most respondents had such a narrow view of risk that they were focusing on only a handful of risks affecting their plans. With an Index value of 82 in 2009, which dipped to 79 the following year, there was a wide gap between the importance plan sponsors ascribed to each risk item and the sponsors' own reported success at managing those risks. At that time, analysis showed that more than two-thirds of all sponsors surveyed indicated some degree of inconsistency in how they viewed and managed pension plan risks.

PLAN SPONSORS TAKING DECISIVE ACTION TO MITIGATE RISKS

In our concluding remarks in the inaugural U.S. PRBI study, we suggested that "2009 might be characterized as the 'year of awareness.'" In 2011, we forecasted that "plan sponsors would develop and, over time, implement strategies to successfully manage [a core set of risk factors affecting their plans]." In 2013, that forecast appears to be coming to fruition. Many plan sponsors are already acting, or planning to take action, to reduce, mitigate and/or transfer risks affecting their plans. This movement from awareness to intent to action – in a five-year time span – is particularly noteworthy in two respects. First, widespread change has traditionally come relatively slowly to the retirement industry, and second, when it has come, sponsors have tended to adopt change in a consistent manner. In this case, the change in perspective has been relatively quick,

[7] For a detailed description on how the Index is calculated, see page 25.

and actions are much more individualized, uniquely tied to each particular firm's business, workforce and financial priorities and circumstances.

When it comes to the steps they are taking, a large majority of plan sponsors indicated that they have already adopted, or they plan to adopt, a liability-driven investment (LDI) strategy as an element of reducing or mitigating risk for their plan(s) or immunizing their portfolio(s), including dynamic asset allocation strategies or increasing their allocations to fixed income. Additionally, quite a few plan sponsors have indicated that they are planning to include lump sum offers to vested former workers and/or retirees as part of their strategy.

With the majority of plan sponsors either "extremely familiar" or "very familiar" with the recent moves by several major U.S. corporations to reduce plan risk through pension risk transfer and other solutions, those transactions appear to be paving the way for additional companies to actively consider a similar approach for their plans. Objectives sponsors are hoping to achieve by de-risking their plans through a full or partial annuitization and/or lump sum offerings include reducing one or more of the following: liabilities, funded status volatility, contributions, pension expense, costs of plan administration and Pension Benefit Guaranty Corporation (PBGC) premiums. Some sponsors, though not a majority, report that the ultimate goal of their actions is to terminate the plan entirely.

UNDERFUNDING OF LIABILITIES AND ASSET & LIABILITY MISMATCH ARE HIGHEST RISKS BY IMPORTANCE FOR THIRD STRAIGHT YEAR

Over the five-year period, the findings of the U.S. PRBI study have also chronicled plan sponsors' shift away from an asset- and returns-centric approach toward managing their plans with a more balanced mindset that takes into account both the liability and asset sides of the pension risk management equation. The rankings of the most important risk factors bear this out.

For the last three years, the first and second most important risk factors have been Underfunding of Liabilities and Asset & Liability Mismatch, respectively. This liability-related focus is quite different from the inaugural study, when two investment-related risks – Asset Allocation and Meeting Return Goals – topped the importance rankings.

It is not surprising that Underfunding of Liabilities continues to be the most important risk factor, especially considering that, at the end of 2012, major consulting and financial services firms, including Milliman, reported that there were near-record low funding positions of under 80%,[8] driven primarily by low interest rates – even as market volatility subsided and many investment strategies posted gains. Fortunately, though the year is young, funded status has shown some signs of stabilizing in the early months of 2013 for many plan sponsors.

[8] Milliman, "2013 Pension Funding Study," March 2013.

SELF-REPORTED SUCCESSFUL MANAGEMENT OF PENSION RISKS REACHES ALL TIME HIGH

Each year the study is conducted, respondents are asked to rate on a scale of 1 through 5, with 5 indicating the highest level of success, how strongly they agree with the statements that describe successful management of each of the 18 risk factors. These ratings are used as indicators for how successfully plan sponsors believe they are implementing comprehensive measures to manage each risk item.

In the 2013 U.S. PRBI study, self-reported success ratings reached their highest levels, with 85% of all ratings indicating success (i.e., a rating of 4 or 5), compared to 83% in 2012, 79% in 2011, 80% in 2010 and 75% in 2009.

LIABILITY MEASUREMENT MAINTAINS TOP SUCCESS SPOT FOR FOURTH CONSECUTIVE YEAR

Liability Measurement retained the number one success ranking for the fourth year in a row. This suggests that plan sponsors have made reviewing liability valuations and understanding the drivers that contribute to their plans' liabilities, including how the liability profile may change over time, a consistent priority. Year-over-year, Plan Governance and Inappropriate Trading maintained their second and third success ranking spots. Note that, of these three risks, only Liability Measurement ranks in the top five in terms of importance.

PENSION PLAN OBLIGATIONS BECOME FRONT-BURNER ISSUE FOR SENIOR MANAGEMENT

Eight in 10 plan sponsors (82%) have quantified the present value of their company's pension obligation relative to their organization's size – as measured by market capitalization, annual revenues, total capital or some other metric. When asked to what extent the size of their organization's pension obligation in relation to the size of their organization[9] has received attention from their senior leadership, nearly six in 10 respondents (58%) indicated that their senior leadership pays very close attention to these obligations.

PLAN SPONSORS SEEK FEWER REGULATIONS, MORE CLARIFICATION FROM PUBLIC POLICYMAKERS

In this year's study, plan sponsors were asked what single action, if they had to suggest just one, public policymakers could take to make maintaining their DB plans easier for their firms. In the wake of accounting rule changes, funding changes, more disclosure requirements, and other actions, plan sponsors were quite passionate in their responses. A general sentiment was a desire for fewer regulations. One plan sponsor noted that "there are too many [regulations], which makes it prohibitively expensive," while others wanted policymakers to "minimize the legislation that changes and affects the management of defined benefit pension plans" and "ease up on restrictions and requirements and disclosures."

[9] "Market capitalization" was included in the question for public companies, while "annual revenues, total capital, or another metric" was included in the question for private companies.

The Index

To conduct the MetLife U.S. PRBI study, MetLife worked with Bdellium Inc. and Greenwich Associates to survey large U.S. pension plan sponsors. As noted in the executive summary, data from this survey were used to calibrate the importance that these companies ascribed to managing each risk, their reported success at implementing comprehensive practices to manage each risk and the consistency between the two, effectively measuring both attitudes toward, and aptitude for managing, pension plan risks. Since the inaugural study, the Index has measured the extent to which attitudes and behaviors have changed over time.

INDEX VALUE[10] REACHES ALL TIME HIGH

Based on the analysis of the 126 survey respondents, the annual value of the Index – 87 out of 100 – is at its highest level in the five-year history of the study. The Index value is up from 85 in 2012, 81 in 2011, 79 in 2010 and 82 in 2009.

As noted earlier in the report, this year's Index has attained the value the researchers believed was achievable at the inception of the study. To put this value in context, the higher the value of the Index, the greater the degree to which plans are being managed by sponsors who are reporting that they are successfully addressing important risks. A rise in the Index value would suggest either an increase in reported success at managing risks that remain highly important, or a decrease in the importance of certain risks that respondents are reporting as less successfully managed. Similarly, a decrease in the Index indicates less success in managing important risks, or greater success in managing risks that are less important. As such, the Index serves as an overall diagnostic for understanding the interplay between pension risk attitudes and aptitudes over time. Appendix A explains in detail the methodology used to calculate the Index.

[10] The U.S. 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 a respondent disagrees strongly or somewhat disagrees that they are successfully addressing the risk. A value of 3 indicates that the respondent is neutral. Values of 4 or 5 indicate agreement or strong agreement, respectively, that they are successfully managing the relevant risk.

At a minimum, every plan sponsor should agree 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 Index value is 75. This sets a minimum acceptable Index value. While it is unrealistic to expect to achieve an Index value of 100, a value of 87 would suggest that sponsors as a group are proactively engaging in pension risk management.

While a liability-centric framework has solidified, minimizing the volatility of their plans is proving challenging for even the most sophisticated plan sponsors.

Importance of Managing Pension Risk

DB plan management has a new mindset. It appears that the days of an asset-centric, total return approach to mitigating risk are truly behind plan sponsors, and the practice of managing assets in the context of liabilities has firmly taken hold. The five-year trending of the U.S. PRBI data bears this out. In 2009, Asset Allocation and Meeting Return Goals topped the list of plan sponsors' most important risk factors, followed by Underfunding of Liabilities and Asset & Liability Mismatch. Today – and for the third consecutive year – Underfunding of Liabilities and Asset & Liability Mismatch are the first and second risks by importance. Meeting Return Goals dropped to sixth in importance, and Asset Allocation barely made the top four.

Of special note in 2013, Accounting Impact moved up to third place in terms of importance, which is the first time it has moved higher than a relatively distant

Table 1: Importance Rankings (2009 and 2013)

Risk Item	2013	2009
Underfunding of Liabilities	1	3
Asset & Liability Mismatch	2	4
Accounting Impact	3	5
Asset Allocation	4	1
Liability Measurement	5	6
Meeting Return Goals	6	2
Ability to Measure Risk	7	7
Plan Governance	8	9
Fiduciary Risk & Litigation Exposure	9	10
Investment Management Style	10	8
Decision Process Quality	11	12
Investment Valuation	12	11
Longevity Risk	13	16
Quality of Participant Data	14	15
Mortality Risk	15	17
Advisor Risk	16	13
Inappropriate Trading	17	14
Early Retirement Risk	18	18

fifth place. The increased attention that the pension funding interest rate stabilization provision of the Moving Ahead for Progress in the 21st Century (MAP-21) Act has brought to the side effects of monetary policy may have served to highlight the difference between how liabilities are calculated for funding and accounting purposes. In addition, informal Financial Accounting Standards Board (FASB) comments made in the fourth quarter of 2012 that FASB is starting to consider making changes to current rules, including mark-to-market rules, may have led to heightened attention in this area.[11]

While a liability-centric framework has solidified, minimizing the volatility of their plans is proving challenging for even the most sophisticated plan sponsors. With *Importance Selection Rates*[12] of 62% and 61%, respectively, a confluence of factors is keeping Underfunding of Liabilities and Asset & Liability Mismatch top of mind. For example, although most DB pension plans experienced significant investment gains in 2012 and many made significant contributions to their plans, the average funded status was still under pressure, at 76.5% for the 100 largest plans included in Milliman's annual study, and estimates ranging from 74% to 83.3%[13] overall, as plan liabilities grew for many companies due to persistently low interest rates. According to a paper by Towers Watson, "Sizable employer contributions coupled with strong financial markets were not enough to counteract the effects of lower interest rates."[14]

The overall order of the importance ranking for major blocks of risk factors (i.e., highest in importance, in the middle in terms of importance and the lowest in terms of importance) remain very similar to 2012, with some movement by individual items within their respective blocks. In addition to the movements noted above, Advisor Risk fell from 14th to 16th and Early Retirement Risk from 16th to 18th. The latter is entirely understandable in light of employment patterns in the current economy, with many workers delaying retirement.

Over the five-year period, Meeting Return Goals declined from the second-ranked risk in 2009 to sixth in 2013. Advisor Risk also had a fairly significant[15] drop in the importance rankings from 13th in 2009 to 16th today. At the same time, Longevity Risk moved up in the importance rankings from 16th in 2009 to 13th in 2011, where it has held steady since.

[11] We note that the International Accounting Standards Board (IASB) changes that include mark-to-market accounting became effective in January 2013, affecting non-U.S. based multinational companies. Some large firms with U.S. plans that have adopted this change in advance of the new IASB rule include Honeywell, IBM, UPS and Johnson Controls.

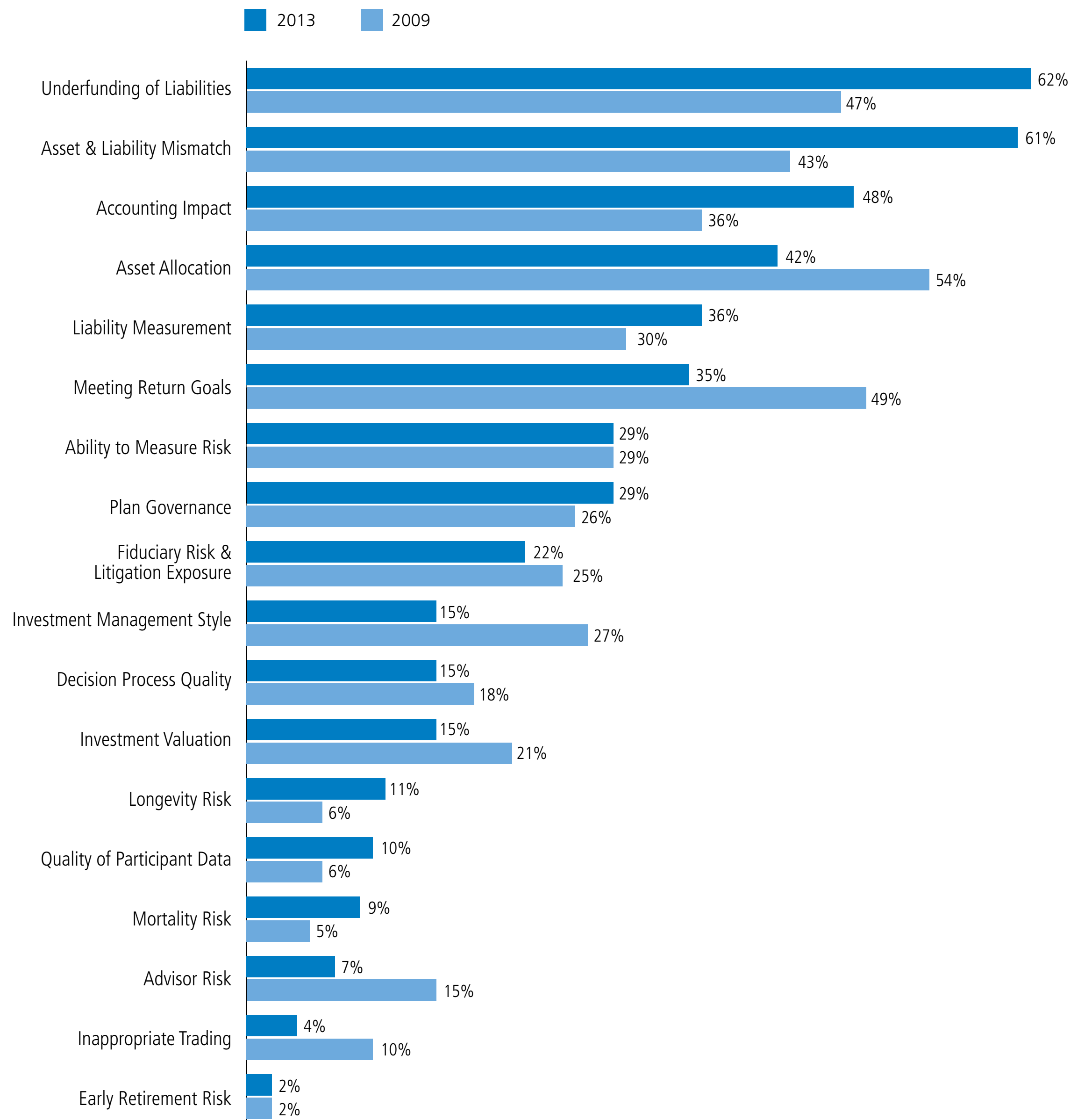
[12] *Importance Selection Rate* is the percentage of times risk factors were selected as the most important when presented alongside other risk factors.

[13] Year-end 2012 reports referenced are the Milliman 100 Pension Funding Index (76.5%), the Mercer S&P 1500 Companies (74%) and the Aon Hewitt Pension Risk Tracker (83.3%).

[14] Towers Watson, "Despite Strong Market Returns, Funded Status of Fortune 1000 DB Plans Declines in 2012," February 2013.

[15] The word "significant" is used throughout this report in its generic meaning and not to imply formal statistical significance. The composition of the sample and the aggregated nature of the reported results preclude using a standard method of calculating statistical significance.

Chart 1: Overall Importance Selection Rates (2009 and 2013)



Following behind Underfunding of Liabilities and Asset & Liability Mismatch, the *Importance Selection Rates* for Accounting Impact and Asset Allocation were 48% and 42%, respectively, while the lowest *Importance Selection Rates* were for Inappropriate Trading, the 17th risk by importance, at 4%, and Early Retirement Risk, which ranked 18th in importance, at 2%.

In terms of *Risk Importance Concentration*, a measurement that indicates the extent to which importance is being ascribed to just a few risk items, plan sponsors are continuing the trend of differentiating among the 18 risk factors to a large degree and concentrating on a core set of risks they believe can have the greatest impact on their plans.[16] Although the *Risk Importance Concentration* has dropped back down slightly to 2011 levels to 37% from 40% in 2012, it is still higher than the 2009 level of 30% and much higher than the 2010 level of 1%, when sponsors ascribed nearly equal importance to all risks.

Interestingly, while the respondents in 2013 are slightly more concentrated than in 2009, they are also very slightly better balanced between the importance assigned to liability- and asset-related risks. What is quite noticeable is that the median/average *Share of Importance* assigned to Asset & Liability Mismatch in 2009 was only 9%/9%, compared to 17%/13% in 2013; while the results are slightly more concentrated, there seems to be a more balanced mix of asset-related and liability-related items and greater attention to their interaction.

[16] 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).

Perceived Success in Managing Pension Risk

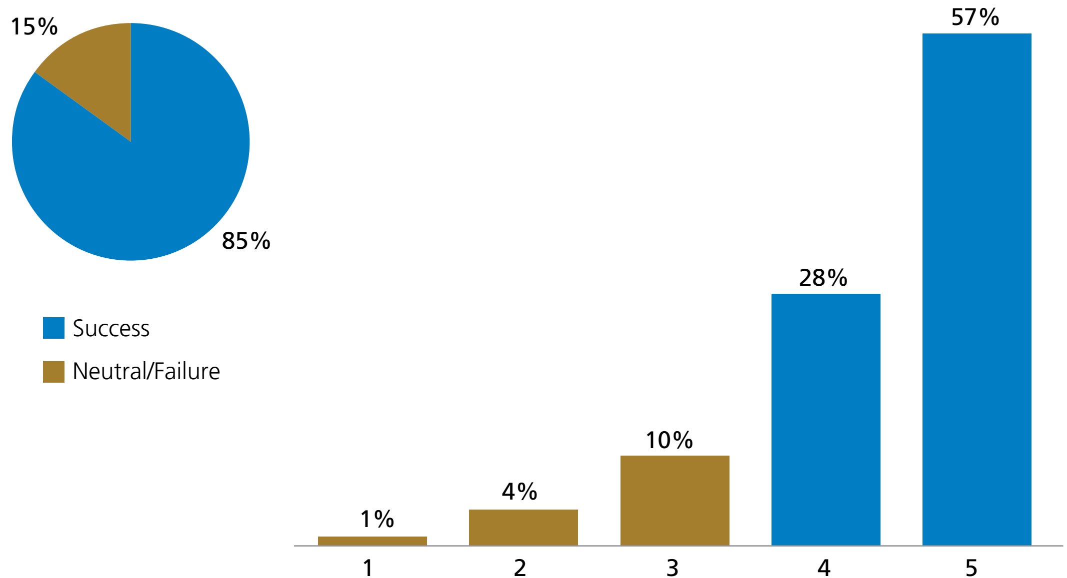
SELF-REPORTED SUCCESSFUL MANAGEMENT OF PENSION RISKS REACHES ALL-TIME HIGH

Each year the study is conducted, respondents are asked to rate on a scale of 1 through 5, with 5 indicating the highest level of success, how strongly they agree with statements that describe successful management of each of the 18 risk factors. The rating is then used as an indicator of how successfully the plan sponsor believes his or her organization is managing each risk.

As with the prior U.S. PRBI studies, we note that, because this is a self-reported rating, success ratings are expected to be high, reflecting a natural bias inherent in self-reporting. These ratings should be considered in conjunction with the analysis in the sections that follow for a more balanced view. In the 2013 U.S. PRBI study, self-reported success ratings reached their highest levels, with 85% of all ratings indicating success (i.e., a rating of 4 or 5), compared to 83% in 2012, 79% in 2011, 80% in 2010 and 75% in 2009. The steady increase over time is more meaningful than the absolute level of the ratings.

Chart 2: Success Rating Frequency (2013)

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



LIABILITY MEASUREMENT MAINTAINS TOP SUCCESS SPOT FOR FOURTH CONSECUTIVE YEAR

Liability Measurement retained the number one success ranking for the fourth year in a row, up from third in 2009, demonstrating that plan sponsors take very seriously the need to routinely review liability valuations and understand the drivers that contribute to their plans' liabilities, including how the liability profile may change over time. It also had an *Average Success Rating*[17] of 4.79, up from 4.51 in 2009. This is consistent with plan sponsors increasingly adopting pension plan management strategies in which investments, asset allocation and risk reduction strategies are evaluated in the context of a plan's liability cash flows, rather than with reference only to external market benchmarks, as was the case just five years ago.

Table 2: Success Rankings (2009 and 2013)

Risk Item	2013	2009
Liability Measurement	1	3
Plan Governance	2	2
Inappropriate Trading	3	9
Advisor Risk	4	4
Asset Allocation	5	1
Investment Valuation	6	6
Accounting Impact	7	8
Investment Management Style	8	11
Quality of Participant Data	9	7
Underfunding of Liabilities	10	10
Meeting Return Goals	11	5
Asset & Liability Mismatch	12	15
Ability to Measure Risk	13	14
Fiduciary Risk & Litigation Exposure	14	12
Mortality Risk	15	13
Decision Process Quality	16	16
Early Retirement Risk	17	18
Longevity Risk	18	17

[17] "The *Average Success Rating* for any risk item is the average of all ratings for that item across respondents who provided a rating.

Table 3: Average Success Ratings (2009 and 2013)

Risk Item	Change	2013	2009
Liability Measurement	0.28	4.79	4.51
Plan Governance	0.19	4.77	4.58
Inappropriate Trading	0.44	4.66	4.22
Advisor Risk	0.18	4.62	4.44
Asset Allocation	0.01	4.60	4.60
Investment Valuation	0.29	4.57	4.28
Accounting Impact	0.31	4.56	4.25
Investment Management Style	0.46	4.50	4.04
Quality of Participant Data	0.24	4.49	4.26
Underfunding of Liabilities	0.32	4.48	4.17
Meeting Return Goals	0.11	4.46	4.35
Asset & Liability Mismatch	0.66	4.35	3.69
Ability to Measure Risk	0.53	4.29	3.76
Fiduciary Risk & Litigation Exposure	0.27	4.25	3.98
Mortality Risk	0.14	4.07	3.93
Decision Process Quality	0.51	4.01	3.50
Early Retirement Risk	0.31	3.60	3.30
Longevity Risk	0.22	3.59	3.37

Note: All figures shown, including the calculation of changes, were rounded to two decimal points.

Year-over-year, Plan Governance and Inappropriate Trading maintained their second and third success ranking spots. Of these three risks, only Liability Measurement also ranks in the top five in terms of importance.

Additional evidence of plan sponsors' confidence in their success in managing pension plan risks is found in the *Probability of Failure,* a value that measures the number of risk items that received a rating of 1 or 2 expressed as a percentage of the total number of plan sponsors who rated that risk item. Three risk items

Table 4: Probability of Failure (2009 and 2013)

Risk Item	Change	2013	2009
Liability Measurement	-1%	1%	2%
Plan Governance	0%	0%	0%
Inappropriate Trading	-8%	0%	8%
Advisor Risk	-1%	1%	2%
Asset Allocation	0%	2%	2%
Investment Valuation	-5%	1%	6%
Accounting Impact	-3%	1%	4%
Investment Management Style	-6%	3%	10%
Quality of Participant Data	-4%	0%	4%
Underfunding of Liabilities	-6%	1%	7%
Meeting Return Goals	0%	4%	4%
Asset & Liability Mismatch	-17%	1%	18%
Ability to Measure Risk	-8%	7%	15%
Fiduciary Risk & Litigation Exposure	-1%	6%	7%
Mortality Risk	2%	13%	11%
Decision Process Quality	-9%	6%	15%
Early Retirement Risk	-6%	17%	24%
Longevity Risk	-4%	18%	23%

Note: All figures shown, including the calculation of changes, were rounded to the nearest whole number.

had a 0% *Probability of Failure* in 2013, and six risk items had a 1% *Probability of Failure.* Additionally, the median of individual *Probabilities of Failure* was the lowest ever at 2%. This compares to 3% in 2012, and 7% from 2009 through 2011.

Longevity Risk, the least successfully managed risk, was again given the greatest *Probability of Failure* at 18%, which was an improvement from its 23% value in 2009.

“The pension plan has been moved ‘from the back burner to the front burner’.”

PENSION PLAN OBLIGATIONS ARE INCREASINGLY VIEWED IN RELATION TO CORPORATE BALANCE SHEETS AND HAVE BECOME A FRONT BURNER ISSUE FOR SENIOR MANAGEMENT

In addition to routinely reviewing their plans’ liability valuations and understanding the drivers that contribute to – and impact – their plans’ liabilities, plan sponsors also appear to be keeping a close eye on the impact of their plans’ liabilities on their companies’ balance sheets. In fact, eight in 10 plan sponsors (82%) have quantified the present value of their company’s pension obligation relative to their organization’s size – as measured by market capitalization, annual revenues, total capital or other similar metrics.

The study also probed about the extent to which the impact of a company’s pension liabilities is a focus of its senior management. When asked to what extent the size of their pension obligation in relation to the size of their organization[18] has received attention from senior leadership, nearly six in 10 plan sponsors (58%) indicated that their senior leadership pays very close attention to these obligations. One plan sponsor comment, in particular, sums it up: the pension plan has been moved “from the back burner to the front burner.” Another sponsor commented that, “The pension is a very valued benefit but [our senior leadership] keeps a strategic eye on it to make sure it’s not getting too big or harmful to the company,” while another noted, “As the pension obligations in relation to the organization’s market cap have increased, the organization’s senior leadership has become more focused on the pension obligations and related volatility of pension expense, contributions and funded status.” For some companies, the pension obligations have also garnered the attention of their boards of directors. A sentiment shared by some other plan sponsors (17%) is that their senior leadership “is aware of the size of [their] obligation relative to the market cap but it’s not at a level that has given rise for any concern.”

[18] “Market capitalization” was included in the question for public companies, while “annual revenues, total capital, or another metric” was included in the question for private companies.

Translating Pension Risk Importance and Success into Action

Ideally, there should be consistency between the importance that plan sponsors ascribe to each of the 18 risks and how successfully they believe they are managing those risks. In general, both resources expended and perceived results contribute to self-reported success. This would translate into all 18 risk factors landing within quadrants on a graph that correspond to the degree of both importance and success ascribed to them by respondents.

This chart to the right may be diagnostic for plan sponsors. For example, risks deemed high in importance that fall into the high success quadrant might indicate that sponsors should stay the course; risks deemed high in importance and low in success would suggest areas of increased focus for sponsors; risks identified as low in importance that fell within the high success area would prompt sponsors to be sure they were not expending more resources than necessary to manage the risk; and, risks in the low importance, low success quadrant should be reviewed to be sure that they are not being inappropriately overlooked. It is important to note that the importance and success rankings indicate how risk items are ranked relative to one another and that a risk that is deemed low in importance or receives a low ranking for success is not necessarily unimportant or poorly managed.

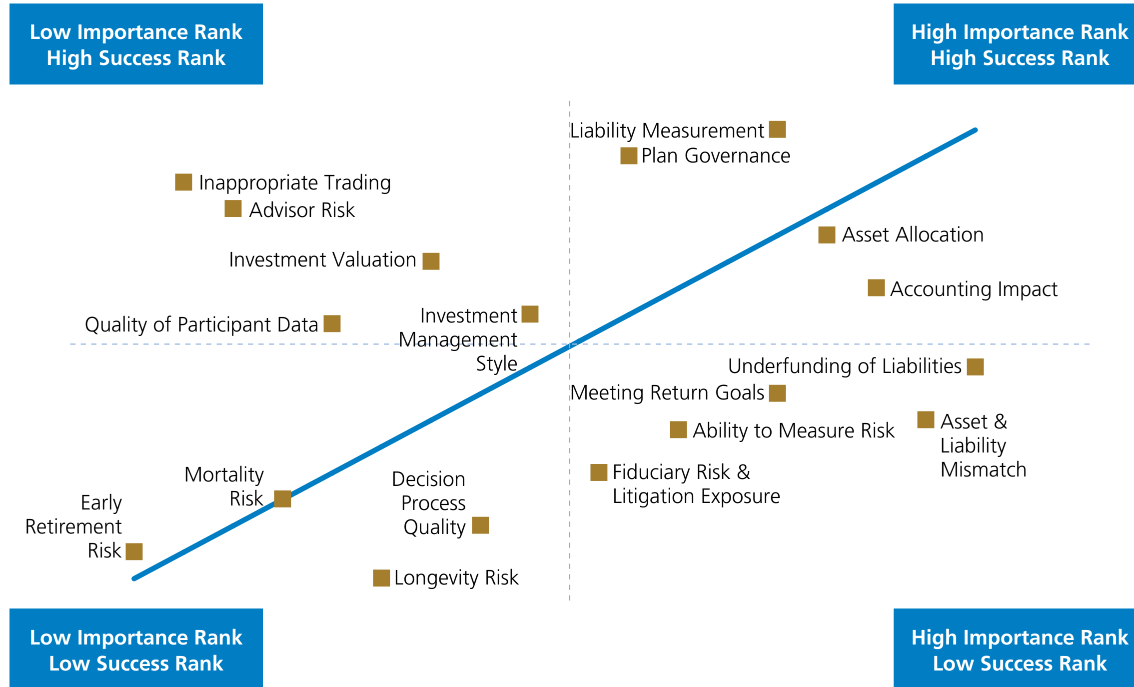
In 2013, the top two risk factors in terms of importance, Underfunding of Liabilities and Asset & Liability Mismatch, continue to be ranked relatively low in terms of self-reported success, at 10th and 12th, respectively, and there can be little doubt that the economic environment and its effect on plans is an underlying driver. On the other hand, Advisor Risk, which ranks 16th in importance, ranks fourth in success. Similarly, Inappropriate Trading, which ranks 17th in importance, ranks third in success. It is important to note that this is a dynamic process. Once consistent action has been taken to address a risk and an effective course of action has been established, the risk posed by the factor is reduced as a result of the action taken.

Only Mortality Risk had exactly the same importance and success ranking at 15th, which indicates that there is 100% consistency between the relative importance plan sponsors ascribe to this risk and how successfully they believe they are managing this risk relative to other risks. This suggests that, while this risk is either not well understood or actively managed, it is not viewed as having a significant impact on plan management.

To view the consistency of importance and success over the five-year time span, see Appendix D.

Chart 3: Consistency of "Importance" and "Success" Rankings (2013)

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



Three measurements or tests have been devised to determine the consistency with which individuals are successfully managing the risks to which they pay the greatest attention for their respective plans:

1) *Importance-Weighted Average Success Rating* – This weighted-average rating can range from 1 to 5 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 4.5.

2) *Ratio of the Importance-Weighted Average Success Rating to the Simple Unweighted Average Success Rating* – This measurement provides some control for the observed upward bias in the success ratings provided by respondents. If a respondent is more successfully managing the risks which they consider more important and vice versa, this ratio will be greater than 100%. A ratio of less than 100% indicates poor alignment of success and importance.

3) *Quadrant 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% indicates significant inconsistency.

The percentage of respondents who passed all three consistency tests (31%) is identical to the percentage of respondents who passed all three in 2009. Additionally, slightly fewer respondents (12%) failed all three consistency tests in 2013, down slightly from 15% in 2009.

Table 5: Results of Three Tests for Consistency Between Importance and Success (2009–2013)

Test Measurement	Number of Respondents					Percentage of Respondents				
	2013	**2012**	**2011**	**2010**	**2009**	**2013**	**2012**	**2011**	**2010**	**2009**
Test 1: Importance-Weighted Average Rating < 4.50	52	79	99	118	96	41%	51%	66%	72%	63%
Test 2: Ratio of Average Ratings < 100%	30	40	51	73	41	24%	26%	34%	45%	27%
Test 3: Consistency Rate < 50%	62	69	71	84	41	49%	44%	48%	51%	27%
Failed All Three Tests	15	18	34	49	23	12%	12%	23%	30%	15%
Passed All Three Tests	39	45	25	24	48	31%	29%	17%	15%	31%

	Test Measurement		
	Importance-Weighted Average Rating	**Ratio of Average Weightings**	**Consistency Rate**
	Maximum		
2013	5.00	118%	83%
2012	5.00	123%	78%
2011	5.00	131%	75%
2010	5.00	115%	89%
2009	5.00	145%	94%
	Median		
2013	4.56	102%	50%
2012	4.46	103%	50%
2011	4.28	102%	50%
2010	4.28	100%	45%
2009	4.39	104%	56%
	Minimum		
2013	3.11	90%	17%
2012	2.61	76%	25%
2011	2.72	68%	17%
2010	2.44	65%	11%
2009	2.47	56%	28%

Many plan sponsors in our study...indicated that they have taken action, or are planning to take action, to reduce plan risk through pension risk transfer.

REDUCING PENSION PLAN RISK THROUGH RISK TRANSFER AND OTHER ACTIONS

Plan Sponsors Taking Decisive Action to Mitigate Risks

In 2013, many plan sponsors are already acting, or plan to take action, to reduce, mitigate and/or remove risks affecting their plans. This movement from awareness to intent to action in the five-year time span since the inaugural study is particularly noteworthy considering the pace at which widespread change has traditionally occurred in the retirement industry.

When it comes to the steps they are taking, about three in four plan sponsors indicated that they have already adopted, or they plan to adopt, a liability-driven investment (LDI) strategy as an element of reducing or mitigating risk for their plan(s) or immunizing their portfolio(s). Among these sponsors, the most common types of LDI strategies identified were: extending fixed income duration of the plan's bond portfolio (63%), asset/liability matching (33%), and dynamic asset allocation (20%).

It is important to note that LDI has become a very – perhaps overly – broad term that comprises a wide range of ideas and actions that may be used alone or in combination, and may be layered over time. What all such approaches have in common is that they are designed in some way to reduce asset-liability mismatch. As a result, LDI adoption may be more indicative of the acceptance that a plan's liabilities should provide the parameters within which asset deployment actions are undertaken, rather than of any one type of investment strategy or product – particularly as investment and insurance may be combined as elements of a risk reduction suite of actions.

With the majority of plan sponsors either "extremely familiar" or "very familiar" with the recent moves by several major U.S. corporations to reduce plan risk through pension risk transfer, those transactions appear to be paving the way for additional companies to evaluate similar approaches for their plans. Additionally, making lump sum settlement offers to vested former workers and/or retirees is under active consideration by a number of sponsors. Nearly four in 10 respondents (38%) indicated they had taken or were planning to take action to de-risk their plans, and about two-thirds of that subset referenced lump sums as an element of their action plan (about 25% of respondents overall). This is consistent with a recent Aon Hewitt study of 230 U.S. employers with DB plans, which found more than one-third (39%) are somewhat or very likely to offer terminated-vested participants and/or retirees a lump sum payout during a specified period in 2013.[19] This includes 14% who are very likely to select this option and 25% who are somewhat likely.

Many plan sponsors in our study also indicated that they have taken action, or are planning to take action, to reduce plan risk through pension risk transfer. For a detailed description of LDI and pension risk transfer solutions, see Appendix E. Sponsors actively considering or taking definitive actions say they are hoping to achieve a number of objectives by de-risking their plans through a full or partial annuitization and/or lump sum offerings. These objectives include reductions in liabilities, funded

[19] Aon Hewitt "2013 Hot Topics in Retirement," January 2013.

status volatility, contributions, pension expense, costs of plan administration and PBGC premiums. While many sponsors are taking these actions for the reasons outlined above in order to continue to make their plans viable, others report that their de-risking activities are intended as steps on the way to terminating their plans entirely.

Others appear to be taking a "wait and see" approach. One respondent reported that they are closely looking at the "experience and success or lack thereof," of those specific companies who have already taken various actions. Notably, only three respondents reported being "not very familiar" with these actions, and none reported having no familiarity at all.

Among plan sponsors who are not planning to reduce plan risk through pension risk transfer, some cite their full funding status, while others cite the low interest rate environment and the "pricing of passing off that risk."

THE DESIRED ROLE OF PUBLIC POLICYMAKERS

Plan Sponsors Seek Fewer Regulations, More Clarification from Public Policymakers

In this year's study, plan sponsors were asked what single action, if they had to suggest just one, public policymakers could take to make maintaining their DB plans easier for their firms. In the wake of accounting rule changes, funding changes, more disclosure requirements and other actions, plan sponsors were quite passionate in their responses. A general sentiment was a desire for fewer regulations. One plan sponsor noted that "there are too many [regulations], which makes it prohibitively expensive," while others wanted policymakers to "minimize the legislation that changes and affects the management of defined benefit pension plans" and "ease up on restrictions and requirements and disclosures." To underscore the point, still another plan sponsor was particularly critical when commenting,"They are over-regulating these DB plans and killing them."

The most common responses to this question were centered on interest rates, suggesting the need for the creation of "a more favorable interest rate environment" by asking regulators to "stop lowering the interest rate" or refrain from "forcing interest rates to be artificially low." Others referenced lowering PBCG premiums and considering certain changes to accounting rules through simplification, a reduction or elimination of the impact of settlement accounting, and stabilizing interest rates used for accounting valuations.

Regarding the Moving Ahead for Progress in the 21st Century (MAP-21) Act and the effect that the pension funding interest rate stabilization provision is having, or is expected to have, on funded status and contributions, responses were generally mixed. While many plan sponsors expect the relief offered by the Act to improve funding in the short term – some rather significantly – and decrease required contributions, others either believe it will have a minimal effect or no effect at all. Those that are already fully funded are largely ignoring it. If they do take advantage of the provision, a general concern is that doing so will "increase PBGC premiums" because "there hasn't been any stabilization or relief provided for PBGC premiums."

Conclusion

One of the burning questions in the industry about the evolution of pension risk management has centered on whether interest would be temporary, persisting only as long as the economic downturn was acute and then rebounding with the equity markets, or whether such interest would be sustained, suggesting a long-term fundamental change in perception. The 2013 U.S. PRBI study makes it clear that the latter is the case, and that an asset-centric approach to pension risk management has, indeed, given way to a more balanced approach that takes into account a plan's assets relative to its liabilities. This broadened approach, which would have been all but unthinkable five years ago, could not have come at a better time for plan sponsors. It has seemingly taken hold as pension plans receive significant attention from their corporate management teams because of the financial effects that their volatility, and in some cases, required contribution levels, places on corporate balance sheets and income statements.

With the benefit of hindsight, it is clear that the economic crisis arriving on the heels of the Pension Protection Act's (PPA) enactment created conditions under which such a sea change became first possible and then inevitable. Plan sponsors as a group have traversed this evolution in a commendable manner that is reflected in the increased Index value.

The 2013 study results also suggest that maintaining or improving a pension plan's funded status while minimizing its volatility will likely remain a top priority for the foreseeable future. The major thrusts of sponsor actions vary in structure and execution but generally have in common a focus on matching assets to liabilities in order to better manage the plan's current exposures, which may include market, interest rate and plan expense risks.

As awareness has given way to understanding, planning and readiness, we offer the following considerations for plan sponsors approaching the cusp of action:

AS A BALANCED APPROACH TO PENSION RISK MANAGEMENT BECOMES THE NEW NORM, EFFECTIVENESS METRICS ARE LIKELY TO BECOME INCREASINGLY ALIGNED WITH PLAN MANAGEMENT ACTIONS

We expect that funded status will increasingly become the basis for evaluating the success of plan management and governance, and that pension plan metrics built around its underlying drivers will gradually replace investment management performance based on external market benchmarks as the primary success indicators. As the way plan success is measured changes and fully catches up with the new framework for decision making, and the tools to measure success become better developed and widely accepted, management and measurement are likely to become more tightly aligned and consistent. This might reasonably be expected to further reinforce senior management and, for publicly traded firms, external analyst support for plan management investment allocations and other actions that result in reduced volatility. Plan sponsors have an opportunity to work actively with their service providers to shape this development of a new generation of effectiveness measures.

When the masses do retire, plan sponsors will need to decide how best to ensure adequate cash flows for each additional year that participants will receive pension benefits.

MACROECONOMIC FACTORS PERSIST BUT SHOULD BE KEPT IN CONTEXT

As funding levels have remained stubbornly low, even when new contributions have been made, many plan sponsors continue to struggle to reduce the unpredictability of their plans. Understandably, they are concerned about managing the volatility of contributions and funded status over the long term. Macroeconomic factors will almost certainly continue to cause problems for pension plan funded status. Markets continue to be somewhat unpredictable, and interest rates will likely remain below natural market levels for some time as economic policies to address the broader economic issues continue to be kept in place, particularly if the downturn lingers longer than the funding adjustments intended to offset its effects, such as those in MAP-21.

Most plan sponsors understand and can accept the overriding factors driving monetary policy for the greater economic good, but as the duration of this economic downturn persists, it is important that the collateral effects of such programs be recognized, lest they themselves become the basis for long-term expectations or obscure the fundamentals of decision making in the best interests of the plan and its participants. Sponsors may want to consider modeling the extent to which results are attributable to the short-term effects of the current environment, which are largely out of their control, versus the extent to which they address the plan's funded status on a normalized or economic basis to help ensure their actions balance short-term and longer-term goals as effectively as possible.

DEMOGRAPHIC TRENDS ARE LIKELY TO TAKE ON INCREASED IMPORTANCE OVER TIME

Although U.S. longevity improvements appear to have slowed somewhat in recent years,[20] plan sponsors should be mindful that Longevity Risk may nonetheless increase in importance over the next several years for DB plans in the U.S. This may occur for several reasons: if the market continues to improve, and retirement-eligible workers who delayed their retirements begin to feel that they are in a better financial position to retire, a large wave of Baby Boomers will likely begin to retire en masse. And, despite a slight slowdown in actuarial assumptions about longer life spans, this generation will still live longer in retirement than previous generations of workers. When the masses do retire, plan sponsors will need to decide how best to ensure adequate cash flows for each additional year that participants will receive pension benefits. While the particular factors that bring this risk into greater and more immediate focus may vary among sponsors, we believe the next generation of risk awareness will integrate longevity risk with other liability-related risks and will affect future asset allocation and risk reduction activities accordingly.

Additionally, if the younger Boomers retire early as some have predicted, Early Retirement Risk may return as a greater concern for plan sponsors. In order to ensure accurate actuarial assumptions, plan sponsors should begin focusing now on the Quality of Participant Data to make certain that census information on participants is accurate and up-to-date.

[20] The Economist, "Life Expectancy: The American Exception," January 11, 2013.

A STRATEGIC REVIEW OF THE PLAN BEFORE SETTLING ON A DE-RISKING STRATEGY HELPS ESTABLISH A SOUND FOUNDATION FOR THE DECISION-MAKING PROCESS

Taking the time to complete a strategic review of the plan helps to ensure that the actions made will be most likely to have the intended effects. Key steps are the following:

- Plan sponsors should determine what they are trying to accomplish with their plan, where the plan fits in with other qualified plans they offer, and how they can achieve the firm's business and talent retention goals in light of the macroeconomic environment in a way that addresses the organization's strategic focus and meets the needs of the plan participants. It may be helpful to recognize that de-risking can be thought of in terms of a continuum of choices, and there are multiple steps plan sponsors can take when they begin, and throughout, the de-risking process as they construct their risk mitigation strategy, rather than thinking of de-risking as a "once-and-done" transaction.
- It is also important to have a clear understanding of both the accounting and economic impacts of the company's DB pension plan obligations vis-à-vis the financial performance of the company's business. This is important in light of the renewed focus underway at FASB on accounting for U.S. plans. Having a clear focus on both a plan's true economic liability[21] and its divergence from the current accounting liability will help ensure a sound decision basis. Once plan sponsors have an understanding of the true economic liability of their plans, they can assess the relative cost to de-risk by settling all or a portion of their obligations in the context of expected ongoing plan management costs.
- In general, funded status is the best indicator of financial flexibility to act and the types of de-risking activities available to a plan at any given time. As a practical matter, plans must remain funded under PPA standards at 80% or higher to consider most actions in order to avoid penalties or limitations.

Perhaps most importantly, this integrated understanding of pension risk appears sufficiently fundamental to be sustained even as interest rates normalize in the future. This suggests that, while specific actions will be unique to each sponsor and its plan(s), the basis for the decisions will not.

[21] In addition to the accounting costs of the projected benefit obligation and funding target, economic costs of a plan include: the present value of future expenses (administrative, investment management, actuarial, and PBGC premiums), mortality expenses and investment risk.

Study Methodology

As part of this comprehensive quantitative and qualitative research for 2013, Greenwich Associates conducted interviews with 126 corporate plan sponsors from October 2012 through January 2013. Interviews were completed by telephone with a web-assisted option, i.e., respondents had the ability to view the risk factors and questions online while answering the survey via telephone. Consistent with previous years' research, respondents were primarily executives responsible for pension investments, risk management or employee benefits, in addition to corporate management. Chart 4 gives the distribution of respondents by DB plan asset size, while Table 6 provides a breakdown of the number of respondent companies by DB plan asset size.

Chart 4: Distribution of Respondents by DB Plan Asset Size (2013)

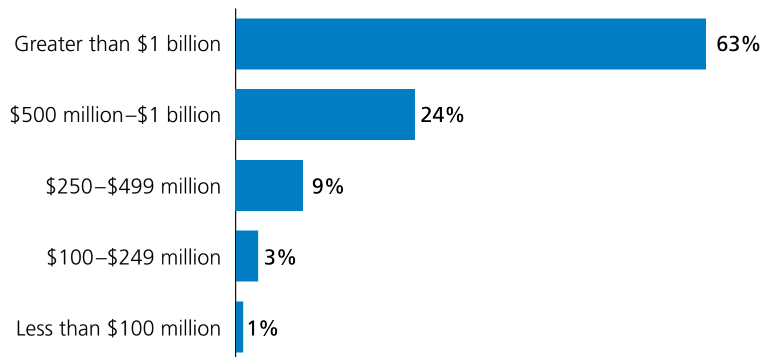


Table 6: Number of Respondents by DB Plan Asset Size (2013)

DB Plan Asset Size	2013
Greater than $1 billion	80
$500 million–$1 billion	30
$250–$499 million	11
$100–$249 million	4
Less than $100 million	1
Total:	**126**

Appendix A

CALCULATING THE INDEX

> 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 believe 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 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 the 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 the 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 *Importance 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: Calculate an equal-weighted industry *Average Success Rating* across all respondents.

The individual *Importance-Weighted Average Success Ratings* for each respondent are summed and the total is divided by the number of respondents. Table 8 illustrates how this is calculated, assuming that the survey had five respondents.

In the inaugural study, the industry average was weighted by the relative asset size of each respondent's DB plan(s). This added complexity to the calculation, and required subjective judgments of plan asset size due to inconsistencies among the assets reported by different data sources. It also potentially exposed the Index to random swings due to whether or not any particularly large plan(s) participated in the survey, which would make year-to-year comparisons more difficult. With the benefit of several years of survey data and after carefully considering different options,

it was therefore decided not to asset-weight the results and instead to assign an equal weight to every respondent. This simplifies the methodology, eliminates the difficulties of determining asset size and improves inter-survey comparison of results.

> 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 Index 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 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.[22]

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 the 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 Rates* 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%.

[22] 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. The Brandes Institute, *Concentrated Portfolios: An Examination of Their Characteristics and Effectiveness*, September 2004. It should be noted that the issues considered in the U.S. PRBI study are different and completely unrelated to the issues in the noted study by the Brandes Institute.

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				

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

Row #	Description					
1	Respondent ID	A	B	C	D	E
2	Importance-Weighted Average Rating (calculated from Step 1 for each respondent)	4.25	3.94	2.75	4.78	3.09
3	Sum of Row 2	18.81				
4	Total Number of Respondents	5				
5	Industry Average Success Rating (Row 3 divided by Row 4)	3.762				

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

Row #	Description	
1	Industry Average Success Rate (calculated from Step 2)	3.762
2	Subtract 1 from the value in row 1	2.762
3	U.S. PRBI value (multiply the value in row 2 by 25)	69

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)	2.00				
6	Share of Importance (each value in row 4 divided by the total value in row 5)	0.125	0.00	0.25	0.25	0.375
7	Equal Weight Equivalent (square each value in row 6, sum the results and take the reciprocal)	3.56				
8	Risk Importance Concentration (subtract the value in row 7 from 18 and divide the result by 17)	85%				

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	
1 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 investment portfolio level, and, where appropriate, within and across different investment fund managers, investment styles and asset classes.
2 Inappropriate Trading	We have designed and proactively review 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.
3 Asset Allocation	We use disciplined rebalancing to implement a documented strategic asset allocation policy.
4 Investment Management Style	We have policies to determine whether we use passive investment managers to track indices or retain active managers, and to the extent we retain active managers, we have processes for systematically measuring and enforcing performance standards.
5 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	
6 Asset & Liability Mismatch	We carry out regular studies that have proven accurate and effective in managing mismatches between the duration of plan assets and liabilities.
7 Underfunding of Liabilities	We have successfully designed and put into place investment strategies that have proven effective in enabling us to comfortably manage our funding contribution levels.
8 Mortality Risk	Distinct from the risk that plan beneficiaries will live longer than expected, we have modeled and understand how the expected mortality of our participants affects our plan cash flows and funding requirements.

Risk Item		Risk Management Statement
9	Longevity Risk	Distinct from the risk that participants will die before obtaining full benefits, we implement and regularly review the effectiveness of procedures to mitigate, transfer or actively manage the risks associated with increasing longevity among plan beneficiaries.
10	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.
11	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		
12	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.
13	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.
14	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.
15	Fiduciary Risk & Litigation Exposure	We explicitly manage fiduciary risk and related litigation exposure based on careful monitoring of litigation trends, including claims, costs and decisions.
16	Investment Valuation	We clearly document, systematically implement and periodically review procedures that ensure the complete, accurate, timely and independent valuation of all plan investments, including non-USD investments or any illiquid or complicated positions such as derivatives, hedge funds or private equity.
17	Liability Measurement	We routinely review liability valuations and understand the drivers that contribute to our plan's liabilities and changes in these over time.
18	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 1	What effect is the pension funding interest rate stabilization provision of the Moving Ahead for Progress in the 21st Century (MAP-21) Act having, or expected to have, on your DB plan's (plans') funded status and contributions?
Question 2	2a) Public Companies - Have you quantified the present value of your pension obligation relative to your organization's size (i.e., market capitalization)? Private Companies - Have you quantified the present value of your pension obligation relative to your organization's size (i.e., annual revenues, total capital or another metric)? 2b) If yes, to what extent has the size of your organization's pension obligation in relation to your organization's (for public companies, show "market capitalization") (for private companies, show "annual revenues, total capital, or another metric") received attention from your organization's senior leadership?
Question 3	3a) On a scale of 1 to 5, how familiar are you with the recent moves by several major U.S. corporations to reduce plan risk through pension risk transfer and other solutions? 5) Extremely Familiar 4) Very Familiar 3) Somewhat Familiar 2) Not Very Familiar 1) Not at All Familiar 3b) Are you considering taking similar action with your plan(s)? Yes – Already taken Yes – Planning to take No Don't Know If yes, what actions, or group/range of actions, have you taken, or are you planning to take? What objectives are you trying to achieve? If no, please share your thoughts about why not.

Open-Ended Questions	
Question 3 *continued*	3c) Have you adopted, or are you planning to adopt, a liability-driven investment (LDI) strategy as an element of reducing or mitigating risk for your plan(s)? Yes - Already adopted Yes - Planning to adopt No Don't Know If yes, what type of LDI approach have you taken, or are you planning to take? If no, could you please comment on your investment strategy?
Question 4	What single action, if you had to suggest just one, could public policymakers take to make maintaining your DB plan(s) easier for your firm?

Appendix C

GLOSSARY OF TERMS

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

Average Success Rating:	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.
Risk Importance Concentration:	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 *minus* *EWE* value)/(number of risk items *minus* 1), expressed as a percentage. The *Concentration Factor* 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.
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. This is a broad measurement of consistency that controls for any bias in the underlying ratings. A result below 50% would indicate significant inconsistency.

Importance-Weighted Average Rating:	In respect of each respondent, multiply the rating assigned to each risk item in Section 1 of the survey by its *Share of Importance* 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.
Probability of Failure:	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.
Ratio of Weighted to Unweighted Average Success Rating:	This is the ratio of the average rating to the *Importance Weighted Average Rating*, 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.
Importance Selection Rate:	The number of times each risk item was selected in Section 2 of the survey as receiving the most attention, expressed as a percentage of the number of times it was included in the choice sets.
Share of Importance:	Each risk item's *Share of Importance* equals its *Importance Selection Rate* divided by the sum of the *Importance Selection Rates* 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 *Share of Importance* values for all risk items always equals 100.00%.

Chart 6: Consistency of "Importance" and "Success" (2009 and 2013)

Risk Item	2013	2009		2013	2009
Asset Allocation			Importance Success	H H	H H
Liability Measurement			Importance Success	H H	H H
Plan Governance			Importance Success	H H	H H
Decision Process Quality			Importance Success	L L	L L
Longevity Risk			Importance Success	L L	L L
Mortality Risk			Importance Success	L L	L L
Early Retirement Risk			Importance Success	L L	L L
Accounting Impact			Importance Success	H H	H H
Meeting Return Goals			Importance Success	H L	H H
Fiduciary Risk & Litigation Exposure			Importance Success	H L	L L
Quality of Participant Data			Importance Success	L H	L H
Inappropriate Trading			Importance Success	L H	L H
Advisor Risk			Importance Success	L H	L H
Investment Valuation			Importance Success	L H	L H
Investment Management Style			Importance Success	L H	H L
Underfunding of Liabilities			Importance Success	H L	H L
Asset & Liability Mismatch			Importance Success	H L	H L
Ability to Measure Risk			Importance Success	H L	H L

Note: The color of the dots in this chart indicates whether or not a risk item is in a consistent quadrant in a given year. Green means that a risk item is in a consistent quadrant (e.g., High Importance/High Success or Low Importance/Low Success). Red means that it is in an inconsistent quadrant (e.g., High Importance/Low Success or Low Importance/High Success).

Appendix E

UNDERSTANDING LIABILITY-DRIVEN INVESTMENTS AND PENSION RISK TRANSFER: A PRIMER

LDI

One of the earliest recognized forms of LDI investing is a bond portfolio with a series of durations set to match a given set of cash flows intended to approximate those of a plan. Such "indemnified portfolios" are an effective way to mitigate some risks, such as interest rate risk, provided that the investment strategy is executed well and that the cash flow estimates are accurate. In actual practice, such strategies alone are not able to fully account for inevitable deviations from expectations around both assets and liabilities. When an annuity-based product for a portion of the defined cash flows is added as part of the overall LDI strategy, the effectiveness of the program may be increased.

A formal full or partial risk transfer is the ultimate LDI solution. By isolating and then transferring pension risk to an insurer, a plan sponsor may be able to take a big step toward reducing a plan's volatility, improving funded status and restoring some stability back to the company's balance sheet. De-risking also provides companies greater flexibility to focus on core businesses.

There are several ways to transfer pension risk. To determine the most appropriate approach, plan sponsors should consider meeting with their company's finance and human resource teams to discuss the long-term approach to their DB plan, and should meet with other experts as needed, such as consultants and insurance companies, to get a good understanding of what options are available and the corresponding economic impact of each. Solutions include:

Pension Buyout

One way to remove all DB pension risks is by transferring the liabilities to an insurance company through a well-established procedure known as a "pension buyout" (also known as a "pension closeout"). A traditional pension buyout usually involves an annuity contract that transfers all future mortality, longevity, expense, early retirement, market and investment risks to an insurance company in return for a single lump sum payment. It allows plan sponsors to remove volatile and expensive pension liabilities from their balance sheets, while at the same time ensuring that pension benefits for current and future retirees – and their beneficiaries – are properly protected. This type of pension risk transfer is generally done in conjunction with a plan termination.

Partial Risk Transfer

Partial Risk Transfer is a risk reduction solution that can be used with both active and frozen DB plans. It may be used as a way to offload a risk (or risks) that the sponsor can easily identify, or those risks with which they are least comfortable. This solution

is also very flexible – if a plan risk can be identified and quantified, it can probably be transferred. Some common examples include benefits for a plan's current retirees, current terminated-vested liabilities, or even particular "tail risks," such as an increase in early retirement elections or future longevity improvements.

Annuity as a Plan Asset

Another option for plan sponsors to consider is to incorporate annuities as a plan asset. Annuities have a return profile similar to other fixed-income investments but can uniquely mitigate risk by providing a guaranteed cash flow perfectly matched to a segment of pension liabilities. As with partial risk transfer, various segments of the pension risk can be immunized through the annuity asset. Unlike a closeout or partial risk transfer, the plan would own the annuity and generally no settlement of the liability would occur, which would mean that the sponsor would not be subject to settlement accounting. A similar strategy has been used in the United Kingdom and is known there as an annuity "buy-in."

Metropolitan Life Insurance Company
200 Park Avenue, New York, NY 10166
www.metlife.com

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