



Prudential
Bring Your Challenges®

REDUCING PENSION RISK:

THE FIVE MYTHS HOLDING BACK PLAN SPONSORS



Scott Kaplan








Senior Vice President
Pension & Structured Solutions

Rohit Mathur

Senior Vice President
Pension & Structured Solutions

PENSION RISK TRANSFER
PRUDENTIAL RETIREMENT

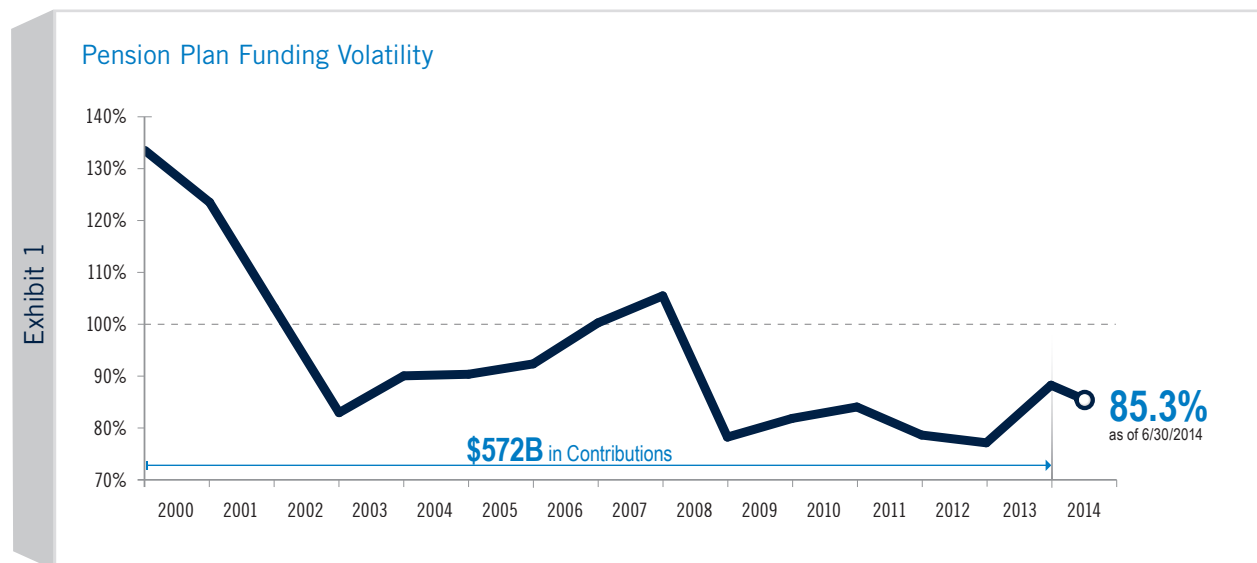
contents

	Introduction	4
	Partial LDI strategies have significantly reduced DB risk	8
	Companies are better off delaying the implementation of DB risk management solutions to benefit from further improvements in the financial markets	10
	Risk transfer solutions can only be executed once a company reaches, or exceeds, full funding	13
	Transferring DB risk to an insurer is too expensive and will become more expensive with new mortality tables	16
	Reducing DB risk, though prudent, reduces shareholder value	18
	Conclusion	21

Introduction

Although the recent equity markets rally and increase in interest rates have helped improve pension funded status,¹ by and large, history has not been kind to U.S. pension plan sponsors. In fact, twice in the past 13 years, America's corporate defined benefit (DB) plan sponsors have seen their plans' funded status deteriorate over 30 percent in market downturns.²

These dramatic declines have strained plan sponsors' finances, raised awareness of pension risk and compelled the 100 largest U.S. corporate pension plans to make approximately \$230 billion in pension contributions between 2009 and 2012.³



Source: Milliman 100 Pension Funding Index; total contributions from the Milliman 2014 Corporate Pension Funding Study.

¹Ratio of Projected Benefit Obligations to Market Value of Plan Assets.

²Milliman 100 Pension Funding Index.

³Milliman March 2013 Pension Funding Study.

Given the rising cost of maintaining DB plans, many companies have taken steps to reduce pension benefits. Across the Fortune 100, the number of firms offering a DB plan that remains open to all employees declined from 53 in 2007 to 30 in 2012. What's more, since 1998, 23 of the Fortune 100 firms froze their pension plans, while 17 closed them.⁴

Many companies say that, in addition to curtailing pension benefits, they are focused on managing the risks posed by their DB plans, with the primary aim of reducing the volatility of funded status and the level of required contributions. This trend is being driven in large part by accounting and regulatory changes. The issuance of Financial Accounting Standards 158 increased the transparency of companies' pension obligations on their financial statements, while the passage of the Pension Protection Act (PPA) in 2006 accelerated the time frames in which companies must address funding gaps. In 2012, plan sponsors received temporary relief from addressing funding gaps with the enactment of a pension stabilization law (the Moving Ahead for Progress in the 21st Century Act, or MAP-21). But in the absence of a continued rise in interest rates, plan contributions will return to pre-MAP-21 levels in just a few years.⁵ As a result, companies have significant incentive to reduce funded status volatility, because an increase in a funding deficit caused by movements in interest rates or equity markets will ultimately result in higher required cash contributions to the plan.

In addition, awareness of longevity risk appears to be on the rise. Just as increasing life expectancy trends have made longevity risk an urgent and decisive issue for pension plan sponsors in the United Kingdom, updated mortality studies underway today in the U.S.

and Canada are beginning to bring similar pressures to North America.⁶

In February 2014, the Society of Actuaries (SOA) released new mortality tables (RP-2014) in an exposure draft that proposes a new basis for mortality assumptions for U.S. pension plans.⁷ In addition, the SOA's Plans Experience Committee also released an exposure draft of the MP-2014 mortality improvement scale. The primary focus of this study was to provide a comprehensive review of recent mortality experience of uninsured private retirement plans in the U.S.

The RP-2014 mortality tables and the mortality improvement scale MP-2014 form a new basis for the measurement of retirement program obligations in the U.S. It is expected that these new tables will be the standard for valuation of pension liabilities and will impact minimum funding requirements, Pension Benefit Guaranty Corp. (PBGC) variable premiums and lump sum calculations. On average, pension liability will increase by an average of 6 to 9 percent for each plan sponsor. It is likely that auditors will discuss the use of these tables with clients in 2014 and may require adoption as early as this year.

A number of respondents to a recent survey sponsored by Prudential and conducted by CFO Research said that obligations from their companies' DB plans are placing constraints on their companies' performance.⁸ In fact, the survey found that:

- 43 percent of finance executives are concerned that obligations from their companies' DB plans constrain cash flow; and
- 36 percent feel pension obligations restrict their ability to invest in growth opportunities.

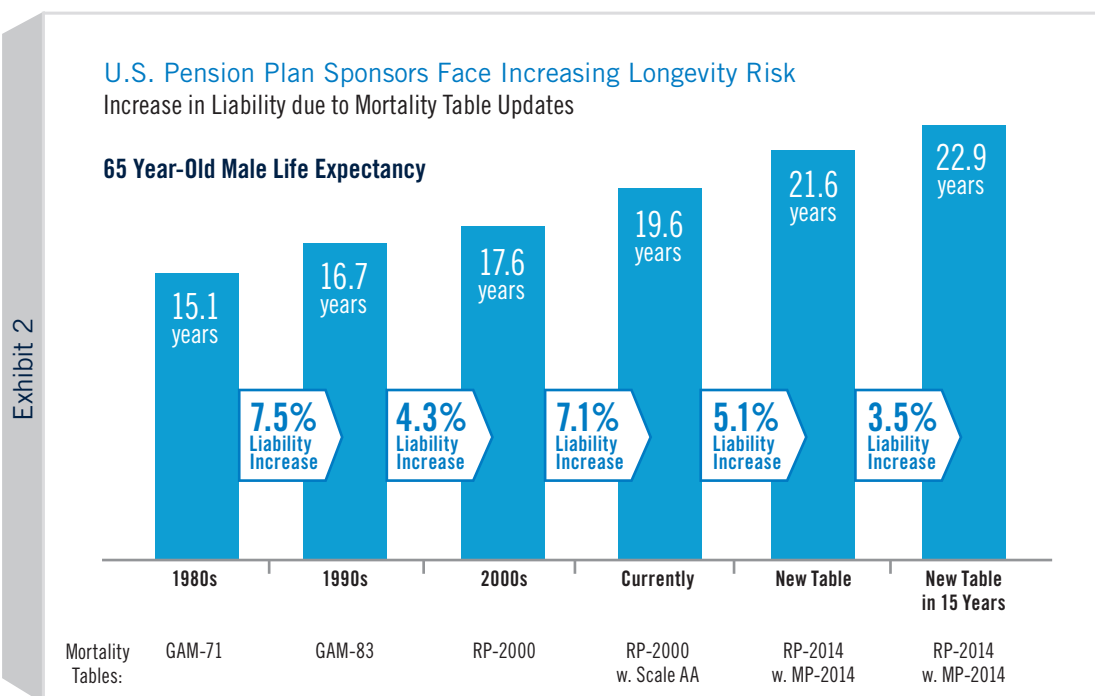
⁴Towers Watson, "Retirement Plan Types of Fortune 100 Companies in 2012," October 2012, pages 2 and 3.

⁵Towers Watson, "Pension Plan Funding Obligations Under MAP-21," September 2012, page 1.

⁶"The Driving Forces Behind Pension Risk Transfer," Amy Kessler, European Pensions, December 2012.

⁷Society of Actuaries, "Mortality Improvement Scale MP-2014 Exposure Draft," February 2014.

⁸Balancing Costs, Risks, and Rewards: The Retirement and Employee Benefits Landscape in 2013," CFO Publishing LLC, 2013.



Source: Prudential calculations.

Intensifying interest in pension risk management solutions

U.S. companies' interest in reducing DB risk is also made evident by the survey, which found that:⁹

- 54 percent of executives say that their companies have implemented, or are likely to implement, risk management approaches such as liability-driven investing (LDI) strategies, which reduce a plan's exposure to interest rate risk. Implementing LDI typically results in a higher allocation to fixed income within a plan's portfolio so that the value of the plan's assets and liabilities will be similarly impacted by changes in interest rates.
- 45 percent of executives say that their companies have already transferred, are somewhat likely to transfer, or are very likely to transfer DB risk to an insurer in the next two years. Transferring DB risk enables a firm to eliminate its exposure to the risks posed by DB plans, including interest rate, investment, and longevity risk. Risk transfer can be accomplished through transactions such as purchasing a buy-out annuity for a portion of a plan's participants, typically its retirees.

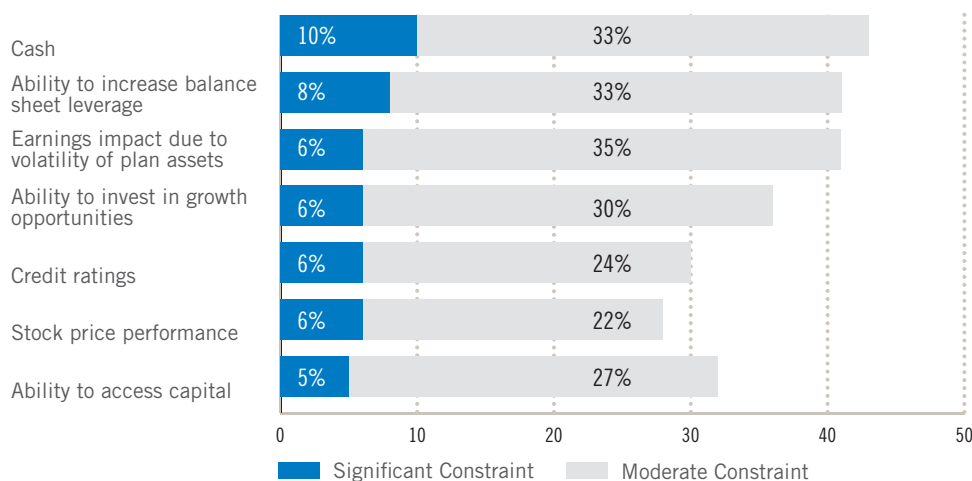
Discussion about risk transfer solutions appears to be heating up. One-third of the finance executives surveyed have discussed DB risk transfer solutions with their consultants within the past year, while roughly the same percentage have discussed DB risk transfer with their boards of directors.

In 2012, a defining moment occurred for the U.S. risk transfer market when General Motors reached an agreement to transfer certain salaried retiree benefit obligations to Prudential as part of a plan to reduce pension obligations by approximately \$26 billion. Verizon Communications quickly followed that groundbreaking transaction by completing their own buy-out transaction with Prudential, settling approximately \$7.5 billion in pension liabilities. In addition, companies invoked other measures (lump sum offers to former vested participants and retirees) to reduce the size of their plan obligations. In aggregate, settlement activities for the Milliman 100 universe totaled \$45 billion.¹⁰ Clearly, the risk transfer standard had been set, and the U.S. marketplace appears primed for a groundswell of de-risking.

⁹"Balancing Costs, Risks, and Rewards: The Retirement and Employee Benefits Landscape in 2013," CFO Publishing LLC, 2013.

¹⁰Milliman 2013 Pension Funding Study, March 2013.

To what extent do the obligations from your company's DB plan constrain your company's financial performance in the following areas?



Source: "Balancing Costs, Risks, and Rewards: The Retirement and Employee Benefits Landscape in 2013," CFO Publishing LLC, 2013.

Disproving the myths of pension de-risking

Despite an increasing interest in and awareness of risk management alternatives, the market has yet to see more large companies implement de-risking, and in particular, risk transfer solutions. While several plan sponsors are currently evaluating their de-risking options, a gap clearly exists between the intentions and actions of some companies with respect to DB risk reduction. The following are five misconceptions, or myths, that are contributing to this gap:

- 1 Partial LDI strategies have significantly reduced DB risk.
- 2 Companies are better off delaying the implementation of DB risk management solutions to benefit from further improvements in the financial markets.
- 3 Risk transfer solutions can only be executed once a DB plan reaches or exceeds full funding.
- 4 Transferring DB risk to an insurer is too expensive.
- 5 Reducing DB risk, though prudent, reduces shareholder value.

The objective of this white paper is to explore these myths in greater detail and to demonstrate why each is false. Disproving these five myths can help expand the range of risk reduction measures that DB plan sponsors are willing to evaluate and implement.



Partial LDI strategies have significantly reduced DB risk

Although many corporate DB plan sponsors say that they intend to adopt LDI strategies, the implementation of these techniques remains modest. A recent survey found that 23 percent of DB plan sponsors are very likely to adjust their plans' investments in 2014 to better match liabilities, while 39 percent are somewhat likely to do so.¹¹

An LDI strategy only results in meaningful risk reduction if a significant portion of a DB plan's assets is allocated to fixed income. The following is one approach to developing a robust LDI strategy:

- First, a plan sponsor can address the interest rate risk posed by the liabilities associated with their plan's retirees. These liabilities represent a set of fixed cash outflows that, for the most part, will vary based on the longevity of the retirees and their spouses. As a result, fixed-income securities are an effective investment option to match the duration and magnitude of the projected cash outflows associated with a plan's retirees. Insurers have long utilized a very similar strategy to invest assets used to support fixed annuity payments.
- Second, a plan sponsor can then choose to address all, or a portion, of the interest rate risk associated with the plan's non-retiree liabilities depending on factors such as the current funded status of the plan. The rationale for not addressing all of the interest rate risk posed by a plan's non-retiree liabilities is that a plan is exposed to other risks, such as the risk of future benefit costs rising due to inflation, within its non-retiree liabilities. Investing in equities and other asset classes such as real estate can help address these risks.

The following case study demonstrates the risks of executing a "partial" LDI strategy. A partial LDI strategy involves asset rebalancing to increase fixed income asset allocation to 45% (from 30%) with a duration that matches the liability duration, and to reduce equity allocation to 50% (from 65%).¹²

This case study is based on the hypothetical DB plan described in Exhibit 4. Fifteen percent of plan assets are reallocated to duration-matched fixed income (from equities). The analysis is based on 1,000 Monte Carlo simulations of equity returns and interest rates to determine how the plan's funded status would change in 10 years. Lower end (10th percentile of plan contributions) captures scenarios

Exhibit 4: Overview of Hypothetical DB Plan

Plan Sponsor Overview

Revenues	\$4.1 billion
Net income	\$275 million
Current market capitalization	\$5.1 billion

DB Plan Overview

Plan assets	\$2.95 billion
Plan liabilities	\$3.11 billion
Plan funded status	95%

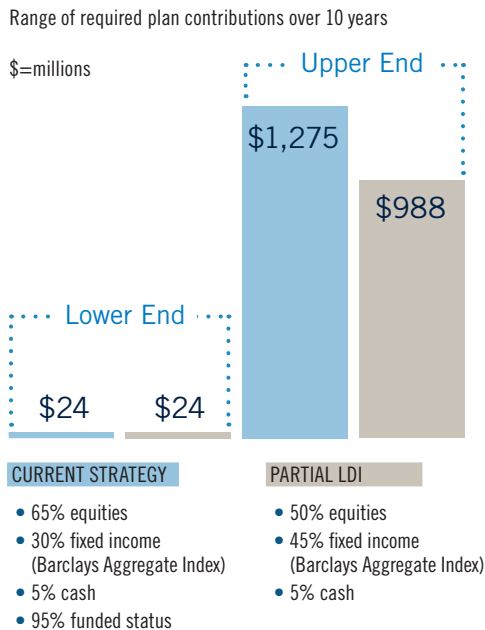
DB Plan Assets and Liabilities

Plan assets	65% equities 30% fixed income 5% cash
Plan liabilities	56% related to retirees 44% related to active employees

¹¹Aon Hewitt, "2014 Hot Topics in Retirement: Building a Strategic Focus," 2014, page 28.

¹²This definition of partial LDI is somewhat consistent with asset allocations reported in Milliman's 2014 pension study (Milliman "2014 Pension Funding Study," pages 4 and 5). Per the study, the largest plans have increased their allocation to fixed income from 28% of assets in 2005 to 40% in 2013, and have either attained their desired allocation or have not reached the next trigger point along their glide path to further de-risking.

Exhibit 5: Impact of the Partial LDI Solution



Notes: Analysis based on 1,000 Monte Carlo simulations of equity returns and interest rates to determine how the plan's funded status would change in 10 years. Lower end (10th percentile of plan contributions) captures scenarios where a rise in equity markets and high interest rates positively impact funded status and lower contribution requirements. Our upper end (or 95th percentile of plan contributions) reflects bad outcomes (or tail risk) where significant decline in equity markets and fall in rates negatively impacts funded status and contribution requirements. Source: Prudential analysis

in which a rise in equity markets and high interest rates positively impact funded status and lower contribution requirements. The upper end (or 95th percentile of plan contributions) reflects the bad outcomes (or tail risk) in which a significant decline in equity markets and fall in rates negatively impacts funded status and contribution requirements.

The results illustrate that this partial LDI strategy only modestly reduces pension risk. In a best-case scenario, for a plan with an initial funding status

of 95%, the projected range of plan contributions at the lower end does not change because the plan is almost fully funded, while the upper end of projected range decreases by \$287 million. Since the plan continues to have significant allocation to equities, risk reduction is modest.

In addition, LDI strategies leave sponsors exposed to longevity risk—or the risk that a plan's participants will live longer than expected—resulting in higher benefits payments. While most plan sponsors have become more attuned to the investment risk that is inherent in their pension plans, longevity risk is a significant yet often ignored risk that cannot be addressed through investment strategy alone.

One solution for plan sponsors seeking to further reduce risk is to combine an LDI strategy with the purchase of longevity insurance from an insurer, a solution that is popular in the U.K. Plan sponsors there have been de-risking their defined benefit pension plans for several years. Incentives are aligned for plan sponsors to proactively manage their risk. These include strict funding regulations, increased accounting transparency, heightened risk awareness, and a multitude of strategies to manage and transfer pension risk. As a result, plan sponsors have been motivated to change their risk profile, which has led many companies to de-risk their plans. Over a two-year period from 2011 to 2012, there were a total of £9.6 billion buy-in and buy-out transactions and a total of £7.3 billion longevity swaps.¹³

¹³“LCP Pension Buy-ins, Buy-outs and Longevity Swaps 2013: Favourable buy-in pricing provides opportunity for pension plans holding gilts,” May 2013, Lane Clark & Peacock (LCP).



Companies are better off delaying the implementation of DB risk management solutions to benefit from further improvements in the financial markets

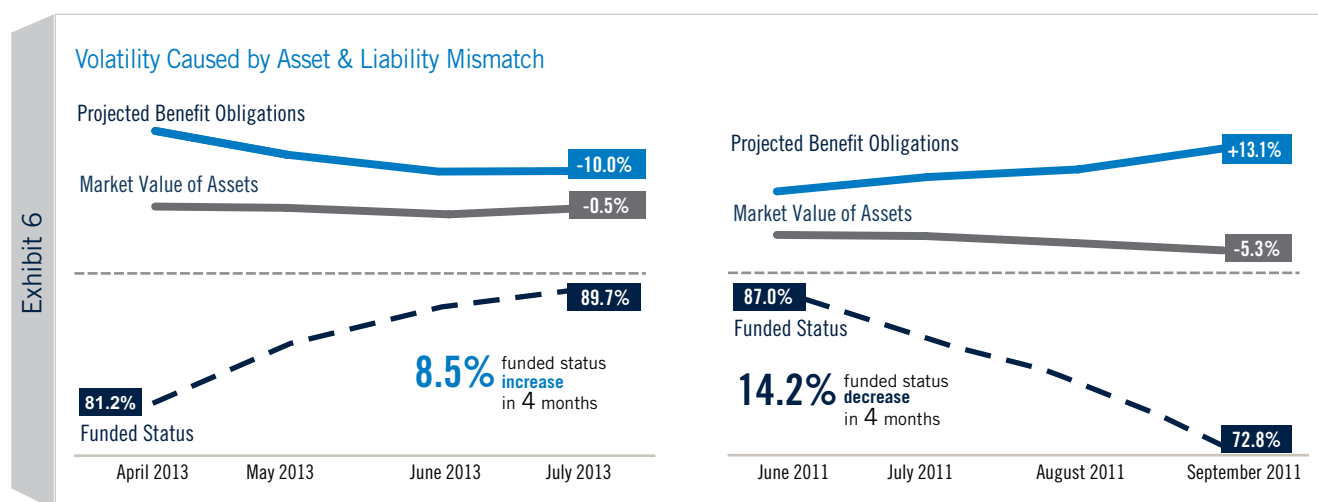
2013 was a year of historic improvement in pension funded status, in particular for those plans with high equity exposure. Specific financial market conditions—both an increase in interest rates for long-duration corporate bonds and in the equity markets—resulted in the improved funded status of the typical DB plan. Despite significant funded status improvements, some plan sponsors may be further deferring potential de-risking actions—such as implementing LDI strategies or purchasing a buy-out or buy-in contract. For example, in a recent survey of U.S. corporate pension executives, 48 percent said their companies will consider diversifying into alternative asset classes like real estate, hedge funds, and private equity to help reduce risk, and to serve as return enhancers.¹⁴

These sponsors may be misjudging the risk they are taking, because specific market conditions must continue to exist for plans to experience further funded status improvement. An interest rate increase for long-duration, investment-grade corporate bonds would benefit plan sponsors more than an increase

for shorter-duration bonds. This is because DB plans must discount future liabilities based on the prevailing rates on investment-grade corporate bonds that match the duration of their plans' liabilities. Moreover, a rise in interest rates for these bonds would not benefit the typical plan sponsor if it were accompanied by an equity market decline.

Over the four-month period of April to July 2013, equity markets rallied;¹⁵ however, because of the surge in interest rates, the market value of pension assets declined.¹⁶ Liabilities also declined, contributing to an 8.5 percent improvement in funded status. However, relying on continuing improvements in market conditions to close funding gaps is a risky venture, because equity markets and interest rates can be volatile and are unpredictable.

As the following chart illustrates, an opposite phenomenon occurred in 2011 when, in a four-month span, liabilities increased 13.1 percent while market value of assets fell 5.3 percent, eroding 14.2 percent in funded status.¹⁷



Source: Milliman Pension Funding Index, October 2011

Milliman Pension Funding Index, July 2013. The percentage of pension fund assets allocated to equities, fixed income and other investments in the Milliman 100 Companies was 38%, 41% and 21% respectively at the end of 2012 and 2011, Milliman 2013 Pension Funding Study

¹⁴Pyramis Global Advisors, "2012 Pyramis Global Institutional Investor Survey," 2012.

¹⁵Total Return for S&P 500 Index between April and July, 2013 was 8.6%.

¹⁶Asset allocation for companies that comprise Milliman 100 Index was: Equities 38%, Fixed Income 41% and Other 21% (Milliman 2013 Pension Funding Study).

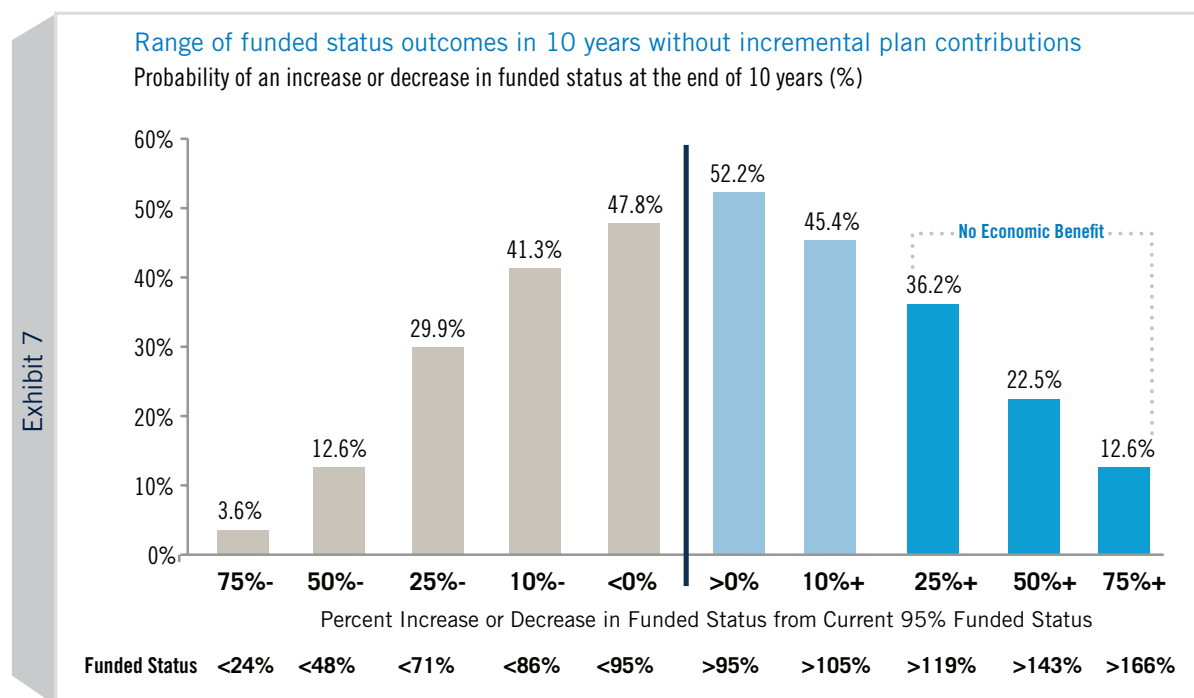
¹⁷Total Return for S&P 500 Index between June and Sept. 2011 was -13.3%.

The risk of relying on improved market conditions to further enhance funded status can be evaluated by measuring how likely a plan's funded status is to improve over time solely through changes in the financial markets. Using the hypothetical DB plan introduced earlier in this paper, Prudential conducted 1,000 Monte Carlo simulations of how this plan's funded status would change over 10 years, assuming no incremental contributions are made to the plan (yet benefit payments are made from plan assets). Financial market conditions, including interest rates and equity markets performance, vary in each simulation. The results of this analysis are provided in Exhibit 7.

As shown in Exhibit 7, there is an approximately 48 percent probability that the plan's funded status will deteriorate at the end of 10 years. Moreover, there is an approximately 30 percent probability that the plan's funded status will deteriorate by 25 percent or

more. For a well-funded plan, these findings illustrate the significant risk of funded status deterioration from current levels.

Of course, some plan sponsors may still be willing to take the chance that future market conditions may (or may not) improve funded status. Sponsors of well-funded plans (average plan is 91.8% funded¹⁸) are poorly compensated for bearing this risk, however. Once a plan's desired funding level is reached—such as 105 percent to 110 percent of plan liabilities, particularly for frozen plans—the plan sponsor receives little economic benefit from a further improvement in funded status, as excess funds in the plan cannot be used for other business purposes. Therefore, as a plan approaches fully funded status, the plan sponsor's upside is capped, as represented by the bright blue bars in Exhibit 7, while its downside is not.



Source: Prudential. Note:

1. Plan asset allocation at the beginning of the 10 years is 65% equities, 30% fixed income, and 5% cash
2. Plan assets are re-balanced annually to match the starting asset allocation of the plan
3. No incremental plan contributions are made during the 10 years
4. Analysis based on 1,000 Monte Carlo simulations of the DB plan over 10 years. Barrie & Hibbert Economic Scenario Generator assumptions used in Monte Carlo analysis

¹⁸Milliman 100 Pension Funding Index, February 2014.

In certain circumstances, delaying the implementation of risk management strategies while, for example, waiting for interest rates to rise will have no discernible impact. For plans with already meaningful positions in fixed income that “well match” the retiree portion of their liability, there may actually be advantages to transferring risk now.

Since these plans are partially immunized against interest rate movements for a given portion of their liability, risk of funded status deterioration due to adverse movements in rates may not be a significant issue. However, the plan continues to own the longevity risk, as well as the cost of plan administration and PBGC premiums. The Bipartisan Budget Act of 2013 resulted in significant increases

in the flat-rate and variable-rate premiums charged by the PBGC, making them now an even larger component of overall plan costs.¹⁹ The increased burden will be greater for plans that are currently in deficit than for plans that are fully funded, at least until the deficit is closed.

Currently, there is ample capacity for transferring risk to insurers. And although capacity is likely to be available in the future through traditional and/or new sources, the cost may rise as the supply-demand dynamic for long-dated corporate bonds changes. Furthermore, the business mix of insurers may shift as their own exposure to longevity risk increases, causing capital to become less abundant.

¹⁹“PBGC Premium Increases in the Bipartisan Budget Act of 2013: Strategic Implications for Pension Plan Sponsors,” January 2014, Aon Hewitt. PBGC flat-rate premiums are \$49 per participant per year in 2014, increasing to \$57 in 2015 and \$64 in 2016, with indexing thereafter. Variable-rate premiums are \$14 per \$1000 of unfunded vested benefits in 2014, increasing to \$24 in 2015 and \$29 in 2016 with indexing.



Risk transfer solutions can only be executed once a company reaches or exceeds full funding

Some pension plan sponsors may believe that risk transfer is only possible when their plans approach fully funded status. In a recent survey of finance executives, 27 percent said they would be more likely to transfer DB risk to a third-party insurer if the funding level of their plans increased.²⁰ This belief is likely based on the awareness of the challenges underfunded plans face in executing the most prevalent risk transfer transaction—the pension buy-out.

A pension buy-out enables plan sponsors to fully transfer risk—including investment, longevity and benefit-option risk—to an insurer. A buy-out also completely removes administrative, actuarial and investment management expenses, as well as eliminates PBGC premiums, for participants whose risks are transferred. A buy-out purges pension liabilities from the balance sheet, guarantees payments to plan participants, and diminishes both accounting and funding volatility. However, a buy-out poses two challenges to plan sponsors, particularly sponsors of underfunded plans.

- A buy-out lowers the overall funding ratio of an underfunded plan. For example, a plan with \$100 million in liabilities and \$75 million in assets has a funding ratio of 75 percent. If this plan executes a buy-out by paying a \$25 million premium to an insurer to transfer \$25 million in liabilities, the plan would be left with \$75 million in liabilities and \$50 million in assets.²¹ As a result, the plan's funding ratio would decline from 75 percent to 67 percent. A lower funding ratio can have negative implications for a DB plan, including an acceleration of required plan contributions.

- A buy-out triggers settlement accounting, because the sponsor is fully transferring the liability to an insurer. Under settlement accounting, the sponsor must accelerate recognition of any deferred losses or gains within its DB plan. However, evidence shows that markets reward companies for de-risking and liability reduction actions, even if they use cash, are earnings-per-share dilutive, and incur a one-time charge.²²

However, there are solutions that enable sponsors to transfer risk even if their plans are not fully funded—most notably, the pension buy-in, and a robust LDI strategy along with longevity insurance.

A buy-in is an insurance contract that enables sponsors to transfer longevity, investment, and interest rate risk to an insurer for a subset of a plan's participants. A buy-in differs from a buy-out in that the contract is retained as a plan asset. Furthermore, a buy-in leaves the plan ultimately responsible for providing pension benefits. These distinguishing features enable buy-ins to overcome some plan specific issues associated with executing buy-outs.

The pension buy-in

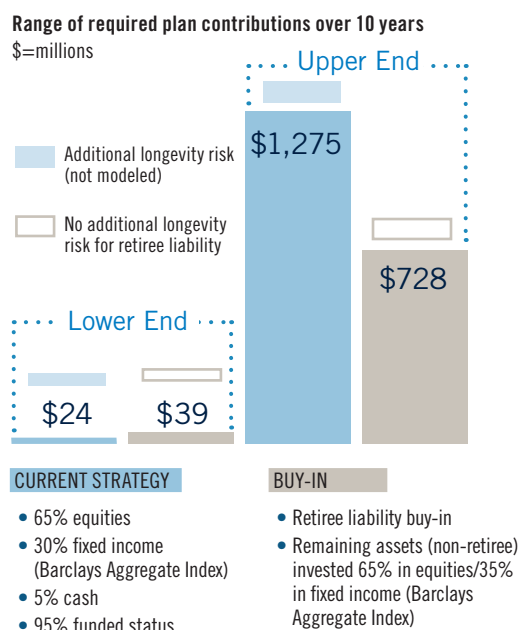
First, a buy-in will not materially impact the overall funding ratio of the plan since a buy-in contract remains a plan asset. Second, a buy-in does not trigger settlement accounting, as the plan remains the benefit obligor and, in turn, collects benefit obligations from the insurer. A buy-in also provides plan sponsors with a phased approach to transferring DB risk, as sponsors can eventually convert to a buy-out. After execution, the value of the buy-in contract is expected to closely track the value of the plan's liabilities addressed by the contract.

²⁰"Balancing Costs, Risks, and Rewards: The Retirement and Employee Benefits Landscape in 2013," CFO Publishing LLC, 2013.

²¹The premium cost above the value of the liabilities being transferred has not been shown to simplify the numeric example. Assumes no incremental contribution is made to the DB plan before the execution of the buy-out.

²²"Pensions in Practice: When Is It Optimal to De-Risk a Pension Plan?" Morgan Stanley, May 2013.

Exhibit 8: Impact of a Buy-in Solution



Notes: Analysis based on 1,000 Monte Carlo simulations of equity returns and interest rates to determine how the plan's funded status would change in 10 years. Lower end (10th percentile of plan contributions) captures scenarios where a rise in equity markets and high interest rates positively impact funded status and lower contributions requirements. Our upper end (or 95th percentile of plan contributions) reflects bad outcomes (or tail risk) where significant decline in equity markets and fall in rates negatively impacts funded status and contribution requirements. Source: Prudential analysis

Similar to a buy-out, a buy-in significantly narrows the projected range of future contributions a plan sponsor will have to make, because the insurer providing the buy-in assumes the risks associated with the plan's liabilities. Although common in the U.K., with nearly \$6.25 billion in such transactions being executed in 2011, and 2012,²³ the first U.S. pension buy-in did not occur until 2011, when Prudential completed a \$75 million agreement with Hickory Springs Manufacturing Company.

Exhibit 8 illustrates the impact a buy-in would have on covering the retirees of the hypothetical DB plan introduced earlier in this paper.

As shown in Exhibit 8, executing a buy-in increases the lower end of the projected range of plan contributions by approximately \$15 million. This is due to the costs associated with completing the buy-in transaction (including recognition of revised longevity assumptions implicit in pricing) and the reduction in the plan's equity exposure.

Conversely, the upper end of the projected range of contributions decreases by approximately \$547 million because of the risks assumed by the insurer, and the replacement of a significant portion of the plan's equities. The significant downside protection with modest loss of upside highlights that the buy-in is a very attractive de-risking option for well-funded plans in current market conditions. The buy-in contract is retained as a plan asset and its value closely tracks the value of the plan liabilities covered by the contract.

It should be noted that the ranges illustrated above do not consider any impact of potential longevity "shocks," which would appear over time in cash flows or in accelerated funding requirements as the plan's mortality basis assumption is modified. A buy-in or a buy-out contract transfers that risk to an insurance company.

LDI + longevity insurance

As discussed earlier, a robust LDI strategy can significantly reduce DB risk by ensuring that a plan's assets and liabilities respond similarly to changes in interest rates. However, LDI strategies still leave sponsors exposed to longevity risk—the risk that a plan's participants will live longer than

²³ "LCP Pension Buy-ins, Buy-outs and Longevity Swaps 2012," Lane Clark & Peacock LLP, February 2013. (Page 30 lists transactions in excess of £100mm.)

expected—resulting in higher benefits payments. One way for sponsors to enhance an LDI strategy is to complement it with longevity insurance, thereby achieving certainty as to the amount they will have to pay each plan participant.²⁴

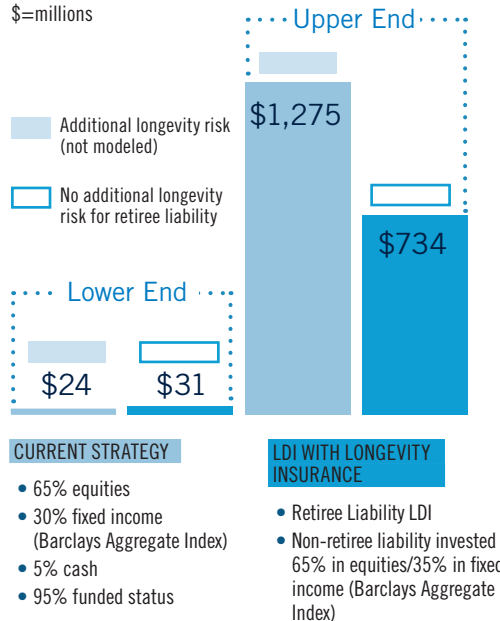
Exhibit 9 illustrates the benefits this solution offers the hypothetical DB plan sponsor introduced earlier in this paper. As Exhibit 9 indicates, the LDI-plus-longevity insurance solution increases the lower end of the projected range of plan contributions by \$7 million, but lowers the upper end by approximately \$541 million. The upper end decreases significantly due to the replacement of a portion of the plan’s equities exposure with fixed income assets that match the plan’s liabilities. These results highlight the significant benefits of de-risking for a well-funded plan.

In addition, longevity insurance protects the plan sponsor from a longevity shock, a scenario in which actual lifespan of a participant is different (higher or lower) than expected. Prudential uses up-to-date mortality tables when calculating pension liability and required contributions. Thus, a longevity shock would result if actual lifespan exceeds the estimate described above, and would adversely impact liability valuation, funded status and required contributions. As shown in Exhibit 9, if the plan sponsor executes its current investment strategy, the sponsor remains exposed to the possibility of a longevity shock and the higher plan contributions this would demand—even beyond the forecasted upper end of the range of projected plan contributions. However, with longevity insurance, the plan sponsor mitigates this risk exposure.

Our analysis shows that both a buy-in solution and LDI along with longevity insurance are effective strategies for significantly reducing risk without negative accounting or funded status implications. However, the buy-in solution could offer some advantages over

Exhibit 9: Impact of the LDI and Longevity Insurance Solutions

Range of required plan contributions over 10 years
\$=millions



Notes: Analysis based on 1,000 Monte Carlo simulations of equity returns and interest rates to determine how the plan’s funded status would change in 10 years. Lower end (10th percentile of plan contributions) captures scenarios where a rise in equity markets and high interest rates positively impact funded status and lower contributions requirements. Our upper end (or 95th percentile of plan contributions) reflects bad outcomes (or tail risk) where significant decline in equity markets and fall in rates negatively impacts funded status and contribution requirements. Source: Prudential analysis

LDI, in particular for smaller plans that lack the ability or desire to implement and monitor sophisticated asset/liability management strategies. LDI strategies can be difficult to implement, and investment basis risk often remains, because it is extremely difficult to create an asset portfolio that perfectly matches the movement of the GAAP liability. In contrast, a buy-in presents no residual risk, and can be converted to a buy-out at any time. A buy-in allows plan sponsors to lock in insurance capacity today while it is readily available.

²⁴Longevity insurance can also protect against the risk of a participant’s joint annuitant living longer than expected.

Transferring DB risk to an insurer is too expensive and will become more expensive with new mortality tables

For some plan sponsors, the prospect of engaging in a pension risk transfer agreement in a buy-out may seem cost-prohibitive.

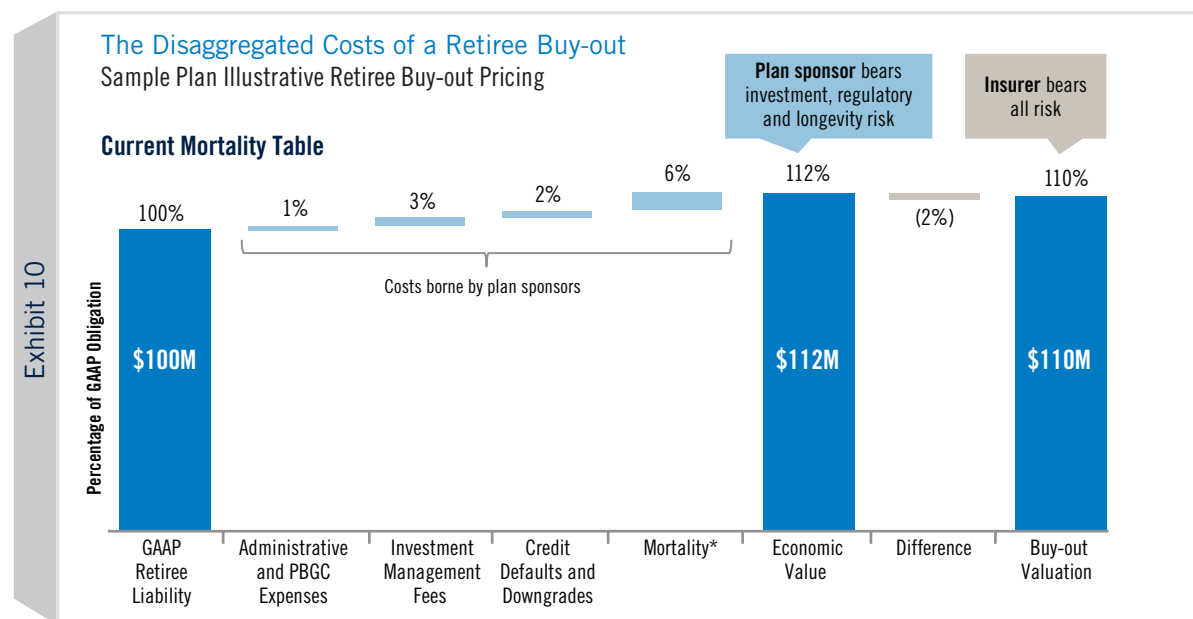
However, when finance executives were surveyed regarding the factors that would most likely incite their firms to transfer DB risk to an insurer, only 25 percent of respondents said that it was too expensive for them to consider.²⁵

In actuality, the economic cost of transferring risk is lower than what many sponsors and analysts perceive, because the cost of transferring risk includes many expenses that sponsors will incur even if they don't transfer risk. A disaggregation of the costs of a retiree buy-out is illustrated in Exhibits 10 and 11.

In Exhibit 10, the total cost of the retiree buy-out is 110 percent of the DB plan's Generally Accepted Accounting Principles (GAAP) liability for its retirees. The buy-out premium includes a capitalization of

the following costs that would be borne by the plan sponsor over time regardless of whether or not they transferred risk via a buy-out:

- **Administrative expenses and PBGC premiums.** Plan sponsors incur annual expenses related to participant servicing and plan administration. These costs are estimated to be \$40 per participant each year. PBGC premiums are \$49 in 2014, increasing to \$57 in 2015, and \$64 in 2016, with indexing thereafter.²⁶
- **Investment management fees.** Plan sponsors incur investment management expenses related to managing the assets within a DB plan. The analysis presented in Exhibits 10 and 11 assumes investment management expenses of 30 basis points per annum.
- **Credit defaults and downgrades.** As an alternative to transferring risk, plan sponsors can execute an LDI



²⁵"Balancing Costs, Risks, and Rewards: The Retirement and Employee Benefits Landscape in 2013," CFO Publishing LLC, 2013.

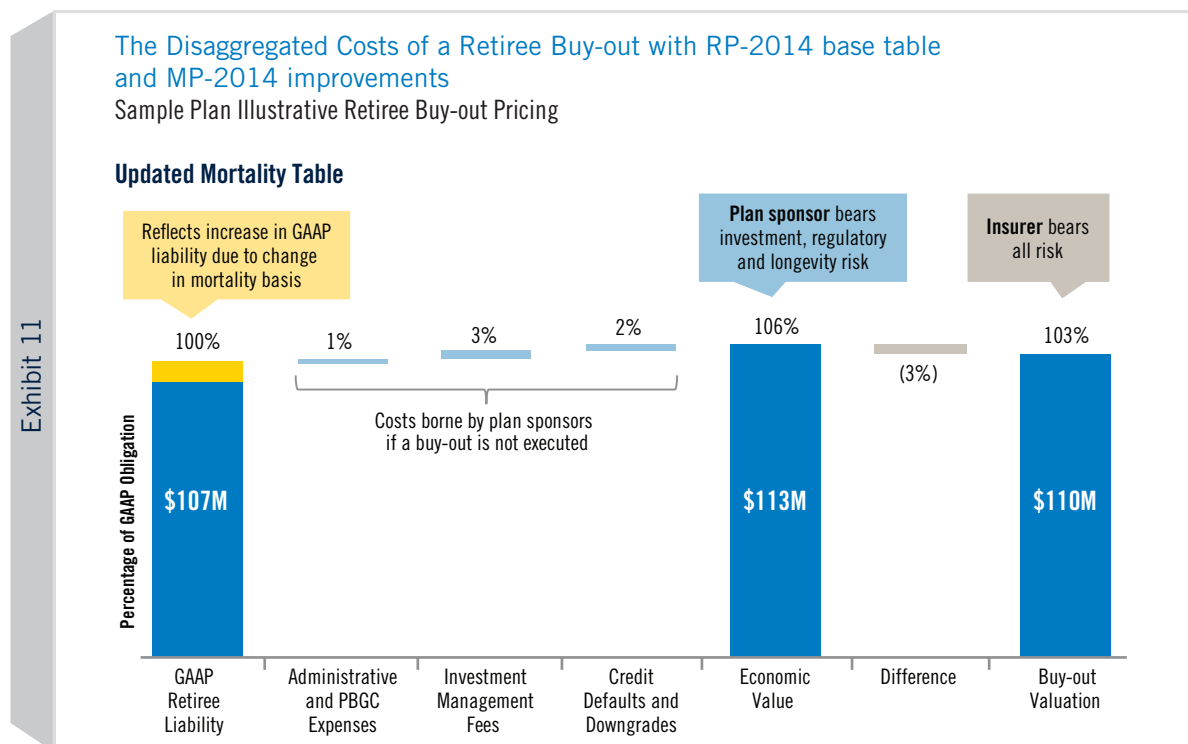
²⁶"PBGC Premium Increases in the Bipartisan Budget Act of 2013: Strategic Implications for Pension Plan Sponsors," Aon Hewitt, January 2014.

strategy that closely matches the plan's assets to its liabilities. Executing such a strategy would require a significant allocation to fixed-income securities, in particular long-duration AA corporate bonds. However, sponsors employing this strategy will incur ongoing costs within the bond portfolio related to credit defaults and downgrades. The analysis presented in Exhibits 10 and 11 assumes that the cost of defaults and downgrades is 24 basis points per annum.²⁷

- **Mortality improvements.** Exhibit 11 reflects a change in mortality basis from the current PPA-prescribed mortality base table (RP-2000) plus the Scale AA improvement scale to the RP-2014 tables with MP-2014 improvements. In addition, insurers pricing buy-outs may have a different forecast for mortality improvements over time than that of plan sponsors. As a company adopts new tables, GAAP liability will increase by 6-9%, making a buy-out appear more attractive, as shown in Exhibit 11 below.

Since the buy-out premium is a one-time payment to the insurer, the premium must account for all similar future costs that the insurer will now bear over time. Of course, executing a buy-out also means that sponsors are paying for these costs in advance via a single payment, rather than gradually over time. In the example shown in Exhibit 10, these costs account for 12 percentage points of the premium for the buy-out, in excess of the GAAP value of the retiree liabilities.

Many plan sponsors could issue debt to fund a pension deficit, and this may be particularly attractive in a low-interest rate environment. By doing so, they replace pension debt that is more volatile with contractual debt. Morgan Stanley found that investors view pension deficits as riskier than corporate debt because when interest rates fall and pension liabilities grow, the pension implicitly claims a greater portion of a company's total assets—to the detriment of its other creditors and shareholders.²⁸



²⁷Prudential analysis of credit default and downgrade costs for a typical AA corporate bond portfolio.

²⁸"Pensions in Practice: When Is It Optimal to De-Risk a Pension Plan," Morgan Stanley, May 2013.

Reducing DB risk, though prudent, reduces shareholder value

Some plan sponsors may be reluctant to adopt DB risk-reduction strategies out of a concern that these solutions may negatively impact key financial metrics, and hence lower firm valuation. Prudential believes that the cost of reducing DB risk should be evaluated against the potential benefit to shareholders.

First, reducing DB risk typically narrows the projected range of required plan contributions in the future. In particular, DB risk reduction reduces the likelihood of very high levels of plan contributions caused by factors such as poor equity market returns, persistently low interest rates and longer life spans. As a result, DB risk reduction can raise the lower end of the valuation range of a firm, assuming a valuation is derived by discounting the projected future cash flows of the company.

Second, DB risk reduction measures can positively impact a company's valuation by lowering its weighted average cost of capital (WACC). This is because a firm's stock beta typically reflects the riskiness of the company, including its DB plan. All else being equal, a company with a higher stock price beta will have a higher WACC. Jin, Merton, and Bodie (2006) were the first to empirically demonstrate the relationship between the riskiness of a company's DB plan and its equity risk.²⁹ The riskiness of a DB plan is based on how the plan's assets are invested and the composition of the plan's liabilities.

This empirical finding makes intuitive sense, because a pension deficit is a form of leverage, and the more highly levered a company is via traditional forms such as corporate debt, the higher its stock beta. Building on prior research, Morgan Stanley recently analyzed the relationship between the DB plans of the companies in the S&P 500 and these firms' equity betas and WACC.

Among the findings:

- The magnitude of a company's pension obligations impacts equity beta. Stock prices of "pension-heavy" companies—those with pension liabilities in excess of 25 percent of market capitalization—tend to be more correlated with the equity markets, and hence have higher equity betas.³⁰ A "pension-heavy" company that permanently settles even a portion of its DB obligations may be able to lower its stock beta.
- DB plans add about 73 basis points to the WACC of the S&P 500, for the median company.³¹
- Pension deficit is riskier than traditional corporate debt because of its volatility and the unpredictable contributions required to service the deficit.

The impact of pension risk reduction on the potential valuation of the DB plan sponsor introduced earlier in this paper is presented in Exhibit 12.

The left-hand side of this exhibit depicts the range of required contributions to the DB plan over the next 10 years for two scenarios, one in which the plan sponsor retains its current investment strategy, and another in which the sponsor executes a buy-in that covers the plan's retirees. The buy-in strategy is not without costs; it increases the lower end of the projected range of required contributions by approximately \$15 million, but lowers the upper end of projected contributions by approximately \$547 million.

The right-hand side of this exhibit presents the impact of de-risking on the company's stock price valuation from two perspectives.

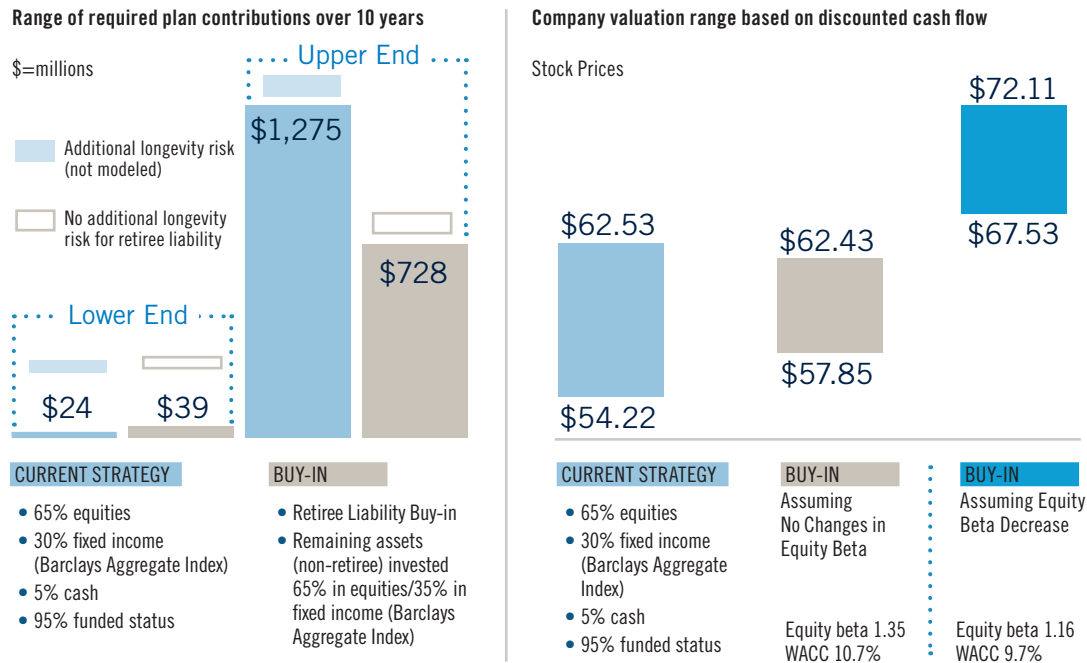
- **No impact of the buy-in on the company's equity beta.** The buy-in reduces the upper end of the company's valuation range by only 10 cents per share, but increases the lower end of the company's

²⁹Jin, L., R. Merton, and Z. Bodie. "Do a Firm's Equity Returns Reflect the Risk of Its Pension Plan?" *Journal of Financial Economics* 81, No. 1 (July 2006): 1-26.

³⁰"How Corporate Pension Plans Impact Stock Prices," Morgan Stanley, May 28, 2013.

³¹*Ibid.*

Exhibit 12: Impact of De-Risking on Firm Valuation Based on Projected Range of Plan Contributions



Notes: Range of required contributions based on 1,000 Monte Carlo simulations of the DB plan over 10 years. Ranges shown reflect the 10th and 95th percentile results. Firm valuation based on discounted cash flows related to the company's business operations and the DB plan. Forecasted operating cash flows do not change with the execution of the buy-in. Projected range of contributions includes the cost associated with executing a buy-in. Source: Prudential analysis

valuation by approximately \$3.63 per share. This reflects the fact that the buy-in significantly lowers the upper end of the projected range of plan contributions over 10 years, though with a modest increase in the lower end of the projected range of contributions.

- **Reduction in equity beta.** The buy-in is estimated to reduce the company's equity beta from 1.35 to 1.16.³² The reduction in equity beta is driven by the decreased riskiness of the company's DB plan as a result of the buy-in execution; this transaction lowers the beta of the plan's assets

from 0.70 to 0.37 by replacing a significant portion of the plan's equities with the buy-in contract, whose value has a lower expected volatility than that of equities. The lower equity beta reduces the company's WACC from 10.7 percent to 9.7 percent, a reduction of approximately 100 basis points. As shown in Exhibit 12, if the execution of the buy-in results in a lower equity beta, the buy-in dramatically improves the company's valuation range compared to the option of maintaining the DB plan's current investment strategy.

³²Methodology and assumptions used by Prudential to estimate the new equity beta based on the findings in Jin, R, Merton, and Z. Bodie. "Do a Firm's Equity Returns Reflect the Risk of Its Pension Plan?" Journal of Financial Economics 81, no. 1 (July 2006): 1-26.

Exhibit 13: Analyst Reaction to
Recent Transactions

GM takes action to reduce its pension benefit obligation by \$26 billion.

“...the move helps significantly reduce economic volatility, improves valuation transparency and enables GM to focus more on making cars rather than managing a pension fund.”

—Morgan Stanley

Source: “General Motors: Pension Down, Credibility Up,” Morgan Stanley, June 1 2012. Used with permission.

“As GM continues to fund and de-risk its pension, investors should develop increased confidence that incremental cash flows will accrue to them, and not the pension. As this happens, GM’s multiple should expand.”

—Credit Suisse

Source: “Doing the Right Things...GM Further De-risks Pension: Positive for Equity holders.” Credit Suisse, Equity Research. June 4, 2012. Used with permission.

J.C. Penney Company, Inc. is a plan sponsor whose shareholders appear to have benefited from DB risk reduction. In May 2009, J.C. Penney contributed common stock to its pension plan to improve its DB plan’s funded status. The firm’s stock price increased 1.4 percent on the day of the announcement.³³ Shortly afterwards, J.C. Penney announced that it was adopting an LDI strategy within its DB plan over the next five years. J.C. Penney explained that the move to LDI is expected to decrease the expected return on plan assets from 8.4 percent to 7, but significantly reduce the volatility of investment returns from 13.2 percent to 6 percent.³⁴ By mid-2010, the beta of J.C. Penney’s stock had declined from 1.37 to 1.26. Also by mid-2010, Standard & Poor’s upgraded J.C. Penney’s credit rating, despite a challenging environment for retailers.³⁵

³³“How Corporate Pension Plans Impact Stock Prices,” Morgan Stanley, May 28, 2013.

³⁴Barry B. Burr, “J.C. Penney buys into LDI for closed plan,” Pensions & Investments, June 29, 2009.

³⁵“How Corporate Pension Plans Impact Stock Prices,” Morgan Stanley, October 2010, page 5.

Conclusion

This paper demonstrates that the conventional wisdom about de-risking DB plans is often false. Invalidating the five myths discussed in this paper can help broaden the range of options that DB plan sponsors are willing to evaluate when formulating their long-term pension strategies. A wider range of options is essential to providing sponsors with the flexibility they need to achieve their long-term DB objectives.

It is also critical that plan sponsors begin evaluating the solutions discussed in this paper as soon as practical, as executing many of these solutions—such as a buy-in or a buy-out—requires significant lead time. Proactive evaluation of these solutions will enable plan sponsors to successfully execute DB risk reduction strategies at the timing of their choice.

Of course, the decision to transfer pension risk is based on the specific nuances and demographics of each particular plan. To determine which solution is appropriate for their companies, plan sponsors should work with their actuaries and advisors to:

- Examine the health of their plans;
- Consider how management of the plans impacts the companies; and
- Explore the available pension risk transfer solutions.

Buy-outs and buy-ins, along with the emergence of longevity insurance in the U.S. market, offer the certainty of outcomes that sponsors may need, along with the benefit security that participants demand. Forward-thinking plan sponsors that make time today to reexamine the assumptions surrounding their pension plan obligations will be able to confidently chart the right course for their pension and their company—and they will be at an advantage relative to those who don't.

Appendix

Risk Management

Executed by
asset manager

LDI

- Liability-Driven Investing (LDI) manages investment risks by closely matching a bond portfolio to the liability cash flows
- Assets and liabilities remain with the pension plan

Risk Transfer

Requires insurance company involvement

Longevity Insurance

- Transfers only longevity risk to insurer and results in a fixed and known life expectancy for plan participants
- LDI can be combined with longevity insurance to address asset and liability risks
- Longevity insurance is actively used in the U.K. but not yet in the U.S.

Buy-in

- Transfers investment and longevity risks to insurer
- Assets remain in the pension plan
- Does not trigger settlement accounting or reduce funded status
- Convertible to buy-out at any time

Buy-out

- Transfers investment and longevity risks to insurer
- Assets transfer to insurer
- May trigger settlement accounting and reduce funded status

Executed directly
by employer

Lump Sum

- Plan pays benefits in a lump sum to specified participants who elect that option, plan liabilities are thereby reduced

Contact

Scott E. Gaul, FSA

Senior Vice President
Head of Distribution
1-860-534-4263
scott.gaul@prudential.com

For more information, please visit pensionrisk.prudential.com



Prudential
Bring Your Challenges®

280 Trumbull Street
Hartford, CT 06103
www.prudential.com

A version of this paper appeared in the 2014 Institutional Investor Journals' Guide to Pension and Longevity Risk Management for Institutional Investors. The published version can be found at www.iiguides.com (<http://www.iiguides.com>).

This information should not be considered an offer or solicitation of securities or insurance products or services. No offer is intended nor should this material be construed as an offer of any product.

Insurance products are issued by Prudential Retirement Insurance and Annuity Company (PRIAC), Hartford, CT, or The Prudential Insurance Company of America (PICA), Newark, NJ. Retirement products and services are provided by PRIAC. Both are Prudential Financial companies. Each company is solely responsible for its financial condition and contractual obligations.

Guarantees are based on the claims-paying ability of the insurance company and are subject to certain limitations, terms and conditions.

©2014 Prudential Financial, Inc. and its related entities. Prudential, the Prudential logo, the Rock symbol and Bring Your Challenges are service marks of Prudential Financial, Inc., and its related entities, registered in many jurisdictions worldwide.

For Plan Sponsor and Advisor Use-Public Use Permitted

0264650-00002-00

PRTWP005