



The Rising Tide of Pension Contributions Post-2008:
How much and when? An analysis of funding for the U.S.
private sector single-employer defined benefit system



Executive Summary

The economic recession of 2008-09 and consequent equity market downturn created many challenges for businesses and individuals. As the U.S. economy continues to climb out of the latest recession, businesses that sponsor single-employer defined benefit pension plans face an additional challenge: rising levels of contribution requirements for their pension plans. This increase has been driven by the aforementioned economic factor, combined with falling interest rates that drive up the cost of providing defined benefit pensions.

This report provides a system-wide analysis of the expected contribution requirements for the U.S. single-employer defined benefit (DB) pension universe over the remainder of this decade. While the pattern of projected contribution requirements that we show in this report is likely not a surprise to most individual plan sponsors, this report is unique in that we show the results of the aggregate system-wide effect. In addition, we evaluate these results in the context of recent history — including recent regulatory and economic changes and how the individual decisions being made have affected the pension system.

This real-life stress test provides valuable insight to the pension system. It shows that the minimum contribution requirement is reactive to market cycles; as interest rates or equity market returns fall, expected contributions across the system rise quickly in response. In addition, it illustrates how highly sensitive the current system is to equity market returns, based on aggregate investment allocation choices. Finally, it raises questions about whether this cyclicity is good for the system. There are choices that individual sponsors can make to combat that cyclicity, and choices that regulators can make with regard to the system as a whole. These choices each come with drawbacks that should be carefully considered. In addition, there are possibilities to think

about how to better design defined benefit pension plans, or their successors, to meet the challenges posed by the 21st century economy.

Key findings from this research report include:

- Historically, cash contributions to private sector pension plans have generally exceeded minimum required levels. Over the ten years ending with 2009, aggregate contribution levels averaged about \$66 billion per year.
- We expect a significant increase in the level of future contributions, based on the projected level of required contributions. We project an average level of about \$90 billion per year over the ten years beginning with 2010, peaking at about \$140 billion in 2016.
- Contributions exceeded required levels by more than five times in 2008 and more than four times in 2009, which suggests that employers have again begun to fund their plans in advance of requirements. These levels indicate that many individual plan sponsors are capable of managing the funding demands of their plans. However, there will be employers for whom this “stress test” poses a greater challenge.
- Required contribution levels are sensitive to the effects of equity market returns, as equity exposure remains significant among the plans in the U.S. private pension system.
- The results of this research report pose interesting questions for both sponsors and policymakers with regard to improving risk management practice and making the system stronger.

Background: Pension Regulations and the Economy

The private-sector pension system in the United States is an employer-based voluntary system that is complemented by a strong (and arguably complex) regulatory environment through the Employee Retirement Income Security Act of 1974 (ERISA) and subsequent laws and regulation. This report provides a system-wide analysis of the expected contribution requirements for the U.S. defined benefit (DB) single-employer pension universe over the remainder of this decade.¹

Key elements of the Pension Protection Act (PPA) of 2006 contribution requirement:

- 1) Cost of benefit accruals (“target normal cost”): the amount covering the cost of new pensions earned for the year
- 2) Amortization payment(s): generally, the amount necessary to reduce the difference between the target liability (obligation for past accruals) and the pension assets set aside to pay for them over a seven-year period; there may be other payments (or credits) depending on the plan’s funded status and history
- 3) Adjustment for excess past contributions: a “credit” for any advance funding that the sponsor may have done (the flexibility of this element was limited by PPA)

There has been a confluence of events over the last several years that have created unique challenges for plan sponsors as they have worked to adapt to both changing pension regulation and changing economic conditions, including declining interest rates, the 2008-09 recession²

and the consequent equity market downturn. These conditions have created a major stress test for the private sector pension system over the last two to three years. Recent economic news has focused on the downgrade of U.S. debt, slowdown in gross domestic product (GDP) growth (including the potential for a double-dip recession) and market volatility, which could pose additional challenges to the private sector pension system.

Since the enactment of ERISA in 1974, pension plan regulation has focused on a goal of fully funding the plan obligations (or liabilities). Pension benefits are a form of deferred compensation, to generally be funded at the time services are rendered and compensation is deferred; full funding also provides participants with benefit security. The Pension Protection Act (PPA) of 2006 (generally effective in 2008) targeted full funding of benefits earned (or accrued) to date, as measured using discount rates based on high-quality corporate bond yields. In general, the law required any plan underfunding that develops to be funded within seven years of its development. As a result, the general expectation upon passage of PPA was that the new law would move the DB pension system to full funding in a relatively short time.

The provisions of PPA have certain smoothing mechanisms available,³ but they are not as flexible as those under prior law because there are tighter controls on the smoothing. As a result, contribution requirements more closely track market conditions. In addition, some of the flexibility in using credit balances⁴ was restricted

¹ This report does not consider the policy debate about the merits of the voluntary system or the appropriateness of the regulatory structure.

² National Bureau of Economic Research, Business Cycle Dating Committee, 2010.

³ The smoothing mechanisms referred to here are designed to reduce fluctuations in required contribution levels by making mathematical adjustments to the asset and liability measurements used to calculate the requirements. Historically, they have allowed sponsors to use an average (or weighted average) rather than actual market value of assets or an average rather than current interest rate.

⁴ Employers can claim “credit” for contributions that exceed the minimum required contribution for a plan. These credits are stored in a “credit balance” and can be used in lieu of cash payments, within certain parameters, against future required minimum contributions (akin to prepaying one’s mortgage and using that prepayment against future mortgage payments).

in the PPA legislation. However, PPA also made changes that increased employer flexibility by allowing the deductibility of contributions significantly greater than the minimum required contribution, so that plan sponsors could tax-efficiently fund plans more during positive economic times.

As plan sponsors started implementing the new provisions of PPA at the beginning of 2008, the economy went into a recession, which was followed by a severe equity market downturn. Employer groups argued that the concurrence of a recession, market downturn and the effective date of PPA did not allow them adequate time to plan for the stricter funding standards. Both employer and union groups called for legislative funding relief to lessen the immediate contribution requirements.⁵

At the same time, there were those who argued against funding relief based on various concerns, including the increased effect of bankruptcies on participant benefit security and the macro-economic concern that relief would not be economically efficient.⁶ Also, concerns were (and continue to be) expressed that the focus on funding relief minimized the broader issue of risk management – namely, that companies should be considering how they might better manage their plans relative to economic cycles.

Nevertheless, two funding relief provisions were ultimately passed: the Worker, Retiree and Employer Recovery Act of 2008 (WRERA) and the Pension Relief Act of 2010 (PRA). Each offered a limited amount of relief (in the form of reduced minimum required contributions) from the funding requirements of PPA.

Cash Contributions vs. Corporate Earnings

The focus of this report is the cash contribution requirements associated with pension funding. It is important to note that the funding requirements primarily affect the liquidity, not the earnings, of sponsoring firms. Separate calculations are performed in accordance with standards set by the Financial Accounting Standards Board to determine the effect of a pension plan's operation on a firm's earnings. As a result of these calculations, any unfunded obligations of the plans should already be on the balance sheets of sponsoring firms. Contributions, when made, primarily have the effect of decreasing the cash and unfunded positions on the balance sheet. Therefore, the rate at which firms must fund their pension obligations does not directly affect their earnings, as much as it directly affects their cash position.

⁵ See American Benefits Council, "Defined Benefit Pension Plan," 2009, and ERISA Industry Committee, Letter to the President, 2009.

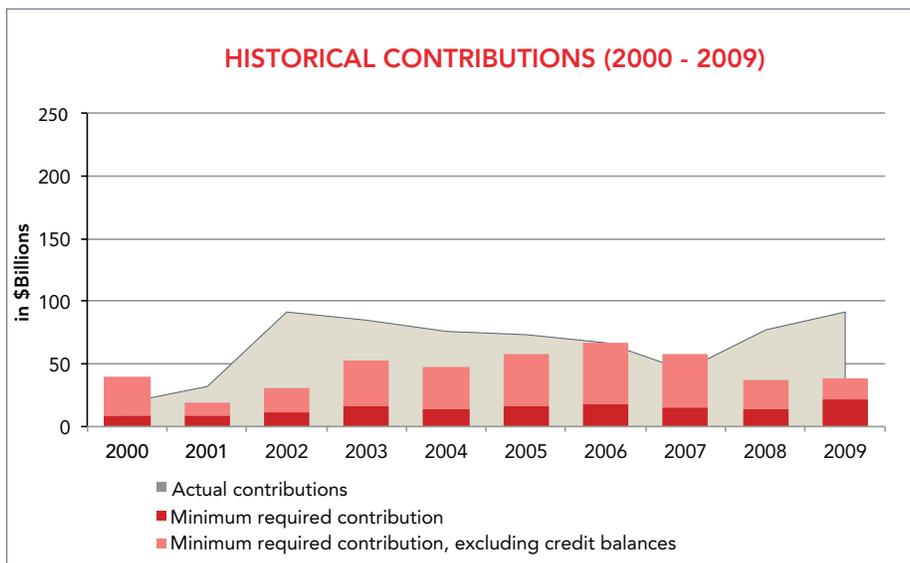
⁶ See Gold and Cassidy, "Congress Should Resist," 2008.

What Have Employers Been Doing

As stated, the purpose of this research report is to provide an overview of the aggregate level of minimum required contributions⁷ for the pension system (as previously defined) through 2019. However, with this brief background of the evolution in pension regulations and economic conditions, it is important to also develop the context of how plan sponsors have funded plans over the past 10 years before looking to the future. Regulatory filings from 2000 through 2009 provide the minimum required and actual contributions employers have been making to the pension system over the last decade (Exhibit 1).⁸ Over the ten-year period, aggregate contributions averaged \$66 billion per year; over the last five years, aggregate contributions averaged slightly in excess of \$70 billion per year. Contribution levels fluctuated from a low of approximately \$20 billion in 2000 to a high of approximately \$90 billion in 2002 and 2009.

The fluctuations in actual contribution levels do not appear to be directly related to the minimum required contribution levels. There are many drivers for plan funding that go beyond the minimum required contribution, including accounting earnings and balance sheet effects, tax deductibility of contributions, reduction or elimination of Pension Benefit Guaranty Corp. (PBGC) variable premiums and avoidance of certain restrictions on lump-sum distributions and plan improvements embedded in pension regulation. Regardless of the reasons they elect to fund, it is clear that, in the aggregate, employers can and do generally choose to fund beyond the required minimum contribution.

Exhibit 1



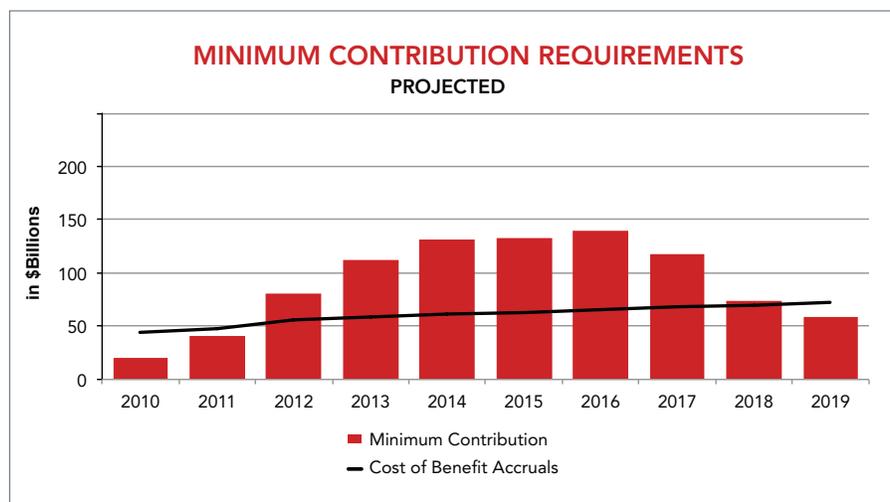
⁷ Plan sponsors may and often do fund an amount in excess of the required minimum contribution. This projection assumes no contributions above the minimum requirement would be made for years 2010 and later. If sponsors were to make additional contributions for 2010 or later years, the timing and amount of future contribution requirements would change.

⁸ Contributions reported on the Form 5500 filings for single-employer DB plans insured by the Pension Benefit Guaranty Corp. (PBGC). Calculations were based on data provided by the PBGC.

Expected Future Contribution Requirements

Our analysis found that, beginning with the 2012 plan year, the private sector defined benefit system faces a substantial increase in required cash funding (Exhibit 2).

Exhibit 2



We estimate the average expected aggregate contribution requirement will be approximately \$90 billion per year for the ten years beginning with 2010.⁹

We project aggregate requirements will increase to approximately \$140 billion in 2016, after which they will decline to “normal” levels by 2018.¹⁰

Examining the graph in Exhibit 2, we find the following factors are driving minimum-contribution requirements:

- The black line represents the cost of benefit accruals (target normal cost) for new benefits that participants earn in each year and generally should be considered a baseline for annual funding requirements.

- There is an overall increase in contribution requirements as we reflect the decline in high-quality corporate bond yields over the past few years. The funding requirements use a

24-month average of high-quality corporate bond yields (the specific yield curve is promulgated by the U.S. Department of the Treasury). The U.S. Treasury publishes a related index,¹¹ which provides a reasonable proxy for movements in the yield curve. The index has declined from a high of 7.90 percent in October 2008 to 5.57 percent in January 2011, and was at 4.99 percent in August 2011. As discount rates

decrease, obligations for past benefits increase, increasing the amortization charges under PPA.

- Effects of the equity market decline and subsequent foregone market returns have increased contributions. While the market has recovered from the most significant declines in late 2008/early 2009, the market is still below its most recent peak in 2007. As of June 30, 2011, the S&P 500 equity index returned 3.34 percent over the past three years and 2.94 percent over the last five years.¹² Investments have grown more slowly than obligations, increasing required contributions.

While this contribution increase is significant, it is important to set it in context. The actual amounts

⁹ Actual and required contributions shown in this report are for the plan year. So, for example, the contribution requirements for plan years beginning on Oct. 1, 2011, were included in the aggregate contribution requirement for 2011.

¹⁰ This projection is based on specific assumptions about future demographic, economic and behavioral events. The actual pattern of contribution requirements will vary. Significant assumptions are disclosed in the appendix.

¹¹ The Composite Corporate Bond Rate (CCBR)

¹² See S&P 500, Equity Indices, as of June 30, 2011.

sponsors ultimately contribute to their plans will differ from the total funding requirements shown in Exhibit 2. Sponsors may and often do contribute in excess of the minimum required (as illustrated in Exhibit 1), which gives them some flexibility to manage the innate cyclicity of the future cash requirements of their plan(s). The peak contribution requirement of \$140 billion in 2016 represents an approximate doubling of the average amount plan sponsors have contributed over the last five years and an increase of 50 percent over the peak contribution from both 2002 and 2009 of about \$91 billion. This is, without a doubt, a significant increase in contribution levels.¹³ And while corporations have generally been accumulating more cash relative to historic levels,¹⁴ not all plan sponsors will be able to meet this contribution increase easily.

With respect to this study, the amount of actual historical contributions provides some indication of the level that sponsors can sustain since they are making contributions in advance of being required to do so. This is important because, as discussed later, the implications of expected future contribution requirements depend not only on the magnitude of the requirements but also on the ability of sponsors to make the contributions.

As noted, the graph in Exhibit 2 includes the cost of benefit accruals, calculated using the methodology prescribed by PPA. Comparing this line to the overall contribution requirements separates the cost of funding new benefit accruals from the cost of funding past benefit accruals. Significant funding requirements will remain even if plan sponsors stop offering new benefit accruals because the portion attributable to previously earned benefits will remain.

Finally, Exhibit 2 shows that after 2018, the expected contributions will drop below the cost of benefit accruals. The projection uses a baseline asset return of 7.4 percent, versus a weighted average discount rate of 5.51 percent.¹⁵ Once a plan becomes fully funded, its assets are expected to grow faster than its liabilities, allowing the sponsor to fund less than the cost of benefit accruals. This is partly a byproduct of the simplified methodology used in our study (we project a single asset return, not a range of possible asset results) but it also matches historical experience wherein equity investments have historically produced returns in excess of risk-free rates over a long period. It should be understood that contribution requirements may or may not fall below the cost of benefit accruals because nobody can predict future events affecting pension plans with certainty (just as nobody can predict future portfolio returns with certainty).

A key challenge for plan sponsors illustrated by the increase in contribution requirements shown in Exhibit 2 is the sensitivity of current funding requirements to market cycles. When looking at Exhibits 1 and 2 together, contributions increase with down economic cycles, as they did with the burst of the dot-com bubble in the early 2000s or the recession that started in 2008. These contribution increases have been attributed to a number of factors, including poor equity market performance, decreasing interest rates (which increase plan liabilities) and changing funding requirements (such as PPA). This research report has not attempted to evaluate causes, although this may be a topic of future work. In addition, we have not evaluated how risk management approaches could be used to better manage this cyclicity.

¹³ Results shown in this report are calculated on aggregate basis. The degree of contribution increases faced by individual plan sponsors will vary significantly and is dependent on many factors. For example, sponsors who have been funding above the minimum may see relatively lower increases, while sponsors who fund only the minimum required level will see relatively greater increases. Other factors relate to the degree of risk taken by sponsors and the outcomes of those decisions.

¹⁴ Federal Reserve, "Flow of Funds," 2011.

¹⁵ Information about these assumptions can be found in the appendix.

Sensitivity Analysis

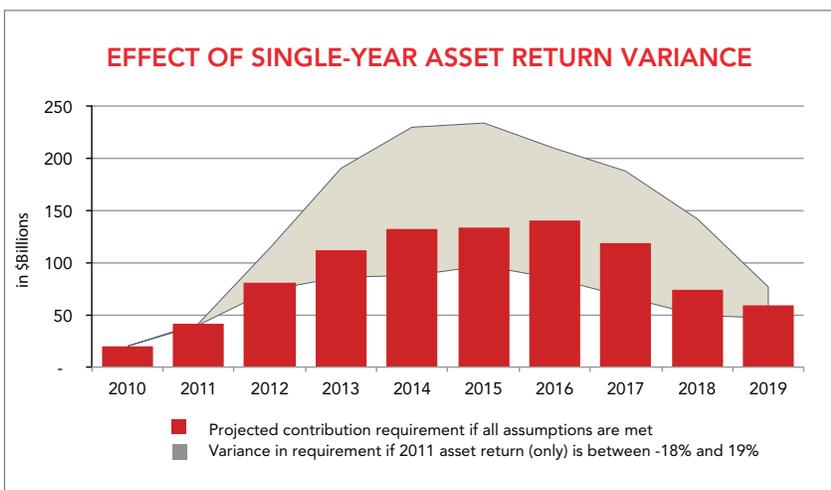
For clarity of presentation, the analysis has thus far assumed a single set of future outcomes for the many variables that will determine future contribution requirements. More detail on the specific assumptions is available in the appendix. The actual contribution requirements will vary from the illustrations presented above. Even as this report is being drafted, the capital markets are exhibiting significant volatility on a nearly daily basis with swings of four percent not being uncommon.

Many plans continue to invest in equities, although financial economists would argue the liabilities are bond-like and therefore plan assets would be best invested in high-quality (or risk-free) fixed income investments.¹⁶ This is a choice that an individual plan sponsor must make, given their own tolerance for risk, the particulars of their business and its sensitivity to market cycles, and their expectations about future equity returns. For this report, we only note that with most sponsors investing in equities, the system will be highly sensitive to volatility in the equity markets and down market cycles. Because

many sponsors still elect to invest in the equity markets, we have modeled the effects of different asset return scenarios to understand the sensitivity of the minimum required contribution to movements in asset returns.

To illustrate a key sensitivity associated with asset returns, Exhibit 3 shows the effect on future contribution requirements if 2011 asset return results (only) are set at the best and worst returns experienced by the assumed portfolio over the previous decade.¹⁷ The assumed portfolio would have returned approximately 19 percent in 2003. Replicating this return in 2011 would lower the peak contribution requirement to around \$96 billion in 2015, assuming all other variables are consistent with the baseline assumptions. This amount is at the high end of the range of contributions paid over the last ten years. In contrast, the assumed portfolio would have lost 18 percent in 2008. Repeating this experience in 2011 would result in a peak contribution requirement of \$234 billion in 2015 — about 2.5 times the peak level of contributions during the last ten years.

Exhibit 3



¹⁶ Bodie, "The ABO, the PBO and Pension Investment Policy," 1990.

¹⁷ Note that all other assumptions, such as the interest rate and asset returns for all future years, are held consistent with the baseline scenario. Only the 2011 asset return is changed.

Going Forward

The recession of 2008-09 and the decline in equity returns and interest rates have come together to create a temporary increase in the amount of required contributions to the private DB system. This increase is significant, and its level and duration are notable. In the short term, the projected minimum contribution requirements shown in this report may present an immediate challenge to a number of private pension plan sponsors. Over the next six to seven years, the system will require significant cash contributions from the firms sponsoring these pension plans. In addition, recent months have brought discussions of a double-dip recession, further declines in interest rates (despite the downgrade of U.S. Treasury securities) and further equity market volatility. The effect of falling interest rates and equity market downturns on the private sector pension system depends on a number of basic conceptual decision points including: how volatility is reflected in the minimum contribution requirements, the choices individual plan sponsors make, and the choices policymakers make with regard to how closely the minimum contribution requirements follow markets. There are actions that plan sponsors and regulators can take to manage these challenges.

PLAN SPONSOR ACTIONS

Individual plan sponsors will need to make choices about whether and how to sustain their plans going forward. Individual plan sponsors can make choices to significantly reduce the effects of interest rate declines and equity market volatility by shifting their asset portfolio from equities and equity-like assets to bonds and bond-like assets.¹⁸ While this generally represents

sound risk management policy by eliminating equity and some interest rate risk from the plan, it will likely increase the baseline cost (because the plan sponsor is forsaking potential equity gains). Plan sponsors who choose to carry equity risk (creating asset-liability mismatch) can voluntarily elect a contribution policy that “smooths” their actual contributions¹⁹ to be something greater than the minimum during equity market upturns to provide additional funding against equity market downturns.

Plan sponsors can also react to reduce cost by modifying their plan designs or freezing their plans (closing the plans to new entrants and/or eliminating future accrual of benefits for current employees). This may decrease or eliminate the cost of benefit accruals for new benefits (the target normal cost) but does not eliminate the need to fund the unfunded obligations created by declining equity market returns and falling interest rates. In addition, at least a portion of the cost of benefit accruals “saved” in the pension contribution is often spent in the form of other compensation, including contributions to a defined contribution plan,²⁰ such as 401(k). The greatest advantage of this response may be to shield the plan, and the plan sponsor, from the effects of future market cycles, without truly alleviating the pain created by the most recent event.

REGULATORY CHANGES

The regulatory structure may also be aligned better, such that it reduces the sensitivity of employers to economic cycles. The goals of PPA are noble: to ensure that plans remain funded on a high level, and to put in mechanisms that move plans toward “full funding” by

¹⁸ To be clear, many more financial instruments are available to plan sponsors. We note two primary asset classes to provide an example.

¹⁹ As permitted within the minimum required and maximum tax deductible limits that often also includes using the “credit balance” mechanisms available in PPA. Doing this can allow plan sponsors to soften the otherwise steep effect of contribution volatility.

²⁰ Rauh, Stefanescu, and Zeldes, “Cost Savings,” 2010.

requiring a seven-year amortization. It also put in specific restrictions for plans that fall below 80 percent and 60 percent funded. But those goals subject plans that want to take equity risk in their investments to increased volatility in their minimum required contribution. Regulators could act to make changes within the system by creating incentives for plan sponsors to improve risk management, or by decreasing the sensitivity of the system to market risk (and to sharp market downturns).

Examples of regulatory changes for better risk management could include linking minimum required contributions to the sponsor's credit rating, the risk taken by the sponsor in the asset portfolio, the relative maturity of the plan itself or a combination thereof. A key underlying principle is to tie the risk profile of pension plans and their sponsors to the required funding, consistent with the regulation of insurance companies. However, this would represent a significant departure from past regulatory principles that generally have assumed ongoing plan sponsors.²¹

Regulators could change the minimum funding requirements to make them less sensitive to interest rate and equity market fluctuations. For example, changes could allow for longer amortization of current shortfalls, giving sponsors more flexibility to determine when they will fund their plans. This approach would modify timing of required contributions but it would not reduce the ultimate amount of contributions necessary to fund the system (it would merely defer funding). It also has certain consequences. Extending the period over which sponsors can fund their shortfall increases the cost of insuring the system, which falls upon the PBGC and the pension sponsors who endure. It also decreases

the security of pension participants, who could lose uninsured benefits in the interim.

MOVING BEYOND DEFINED BENEFIT PENSIONS

Choices available to plan sponsors and plan regulators are limited, based on the limitations of the defined benefit system itself. From a risk management standpoint, the DB system puts significant financial risks with the plan sponsor (and with the PBGC, as the insurer of the system). This provides a great service to participants — who are relieved of these risks — but the cost is not insignificant.²²

Pensions are deferred compensation provided in the form of longevity insurance (insurance against outliving your assets). Most insurance systems are designed with behavioral incentives for the insured that drive down the cost of the insurance: health insurance co-pays ensure individuals don't run to the doctor for every ache; fire insurance rates are reduced for houses with smoke detectors; car insurance rates decrease for safe drivers. In the case of traditional pensions, there are generally few behavioral incentives (in this case, plan design structures) that share risk between the participants and plan sponsors. It may be necessary for plans to evolve such that, as people live longer or markets fluctuate, there could be ways for plan sponsors to adjust benefits accordingly, decreasing their risk (and cost) of operating a plan. Currently, these structures meet neither the defined benefit nor defined contribution model as codified in regulation, and therefore could not be enacted. Further information and investigation on this topic can be found in the Society of Actuaries' Retirement 20/20 initiative,²³ which seeks new retirement designs for the 21st century.

²¹ Regulations have historically based funding requirements on the funded status of the plan, without regard to the ability of the plan or its sponsor to fulfill obligations.

²² Note that the defined contribution system, including 401(k) plans, flips who bears the risks. The employer has no financial risk once they've made their contribution, and the participant faces all the market and other associated risks.

²³ Society of Actuaries, "Retirement 20/20," 2009.

Conclusion and Areas for Future Analysis

We found that expected future contributions to the private sector defined benefit system will increase significantly over the remainder of this decade, peaking in 2016 at about twice the average level of contributions made during recent years. The expected increase resulted from a number of factors, including the recession of 2008-09, the consequent equity market decline, and declining interest rates. Data showed that employers have contributed well in excess of the minimum requirements for the last several years, which suggests that employers have, in aggregate, begun to step up to increased contribution levels. However, there will be individual employers for whom this poses a greater challenge. Our sensitivity analysis showed that aggregate contribution levels remain sensitive to the effects of equity market returns because the U.S. private sector pension system still has a significant exposure to equities.

The results of this research report show how individual decisions about plan design, funding and regulation affect the single employer defined benefit system. They pose interesting questions for both sponsors and policymakers with regard to improving risk management practice and making the system stronger. Possible areas for further study include revisiting this study over time as the economy changes and more data is available regarding plan sponsor responses, considering the effect of various future economic scenarios on contribution requirements, and looking at different risk management techniques or regulatory changes and their effect on contribution requirements.

Longer term, this line of research may lead to an investigation of ways to accomplish counter-cyclical funding of the system, i.e., ways to accomplish funding when cash resources are plentiful and avoid the need for funding when resources are scarce. Finding a successful method to reduce the volatility of cash demands on the employers who sponsor defined benefit plans would make DB plans more attractive and improve the security of participants.

Appendix: Methods and Assumptions

This report shows several deterministic projections of the estimated aggregate minimum funding requirements for the U.S. single-employer defined benefit system, with the intent of developing an understanding of the timing and amount of required contributions. The projections were developed using the Pension Insurance Modeling System (PIMS), originally developed for the PBGC. Starting with data from publicly available regulatory filings, PIMS simulated the demographic and economic experience of 421 single-employer DB plans, representing about half of the benefit obligations of plans insured by the PBGC, using parameters determined by the Society of Actuaries. It then performed actuarial valuations of each plan for each year of the projection period and calculated the resulting minimum required contributions. The results from the sample of 421 plans were then extrapolated to the single-employer universe of plans.

In conducting the projections, the model relied on data supplied by the PBGC as of December 2010, which consisted of selected data from publically available Form 5500 filings made by defined benefit sponsors. The selected data included information about plan demographics, benefit structures, asset values, liabilities and actuarial assumptions for 421 large pension plans. While we cannot verify the accuracy of all the information, the supplied information was reviewed for consistency and reasonability.

PIMS used assumptions to simulate future actuarial valuations and actual future experience. Given the deterministic nature of the projections, the results shown are highly sensitive to key assumptions. Key demographic and economic assumptions made for this analysis were:

	VALUATION		EXPERIENCE
DEMOGRAPHIC			
<i>Active headcount</i>	Closed group		Constant for ongoing plans
<i>Termination rates</i>	As disclosed on Schedule B/SB		As disclosed on Schedule B/SB
<i>Disability rates</i>	As disclosed on Schedule B/SB		As disclosed on Schedule B/SB
<i>Retirement rates</i>	As disclosed on Schedule B/SB		As disclosed on Schedule B/SB
<i>Mortality rates (pre- and post-retirement)</i>	RP2000 projected 10 years beyond the valuation date, assuming 60/40 male/female population		RP2000 projected to the valuation date, assuming 60/40 male/female population
ECONOMIC			
<i>Effective interest rate</i>			
	2009	7.90%	
	2010	5.74%	
	2011+	5.51%	
<i>Asset return</i>			
	2008		-22.66%
	2009		19.43%
	2010		7.89%
	2011+		7.40%
<i>Wage increases (pay-related plans)</i>	3.00% plus a merit increase derived from participant data		4.00%
<i>Benefit increases (non-pay-related plans)</i>	None		4.00%
<i>National average wage increase</i>	4.00%		4.00%
<i>Inflation (consumer price index)</i>	2.30%		2.30%

The asset return assumption for years after 2010 was derived from 5,000 asset return scenarios provided by Hewitt EnnisKnupp. (The Society of Actuaries thanks Hewitt EnnisKnupp and its volunteers for their assistance.) The median geometric average return over the 2011-15 period was 7.40 percent.

The effective interest rate (EIR) assumption for 2011 and beyond was based on the Treasury High Quality Market Corporate Bond Yield Curve for December 2010 and aggregate projected benefit payments for benefits accrued through the 2010 plan year.

No bankruptcies or plan changes (including plan freezes) were assumed during the projection period. The valuation of plans with a fiscal year beginning after June 30 used assumptions for the next calendar year. All participants were assumed to elect a single life annuity form of payment.

Minimum funding requirements were modeled on the provisions in the PPA of 2006, as amended by WRERA. The analysis did not include an assumption about the effect of the PRA of 2010. Relatively few plan sponsors have elected to take advantage of the relief offered by PRA so far, but increased election rates for the 2011 and 2012 plan years may have a noticeable effect on the projections in this report. The model assumed that all sponsors elected to use 24-month smoothing of interest rates and 24-month smoothing of the actuarial value of assets (AVA). The smoothing was modeled by averaging values at the three valuation dates ending with the current valuation date. Prior to averaging, asset values were projected to the current valuation date using the EIR for the intervening periods. Unless otherwise stated in the report, sponsors were assumed to contribute the minimum amount of cash required by the PPA after application of their available credit balance. Actual contributions were used if they were included on a Form 5500 Schedule B/SB filed by Oct. 27, 2010, and exceeded the modeled minimum requirement. All cash flows (contributions attributable to the plan year and benefit payments during the plan year) were assumed to occur at the end of the plan year. The results of each plan year were summed to produce the aggregate result for that year.

To model the universe of single-employer DB plans in the United States, the results generated for each plan in the sample were multiplied by a factor based on the 2008 benefit liabilities (funding targets) for the universe and the sample. Prior to calculating the multipliers, the plans in the sample were categorized by the funded status of the largest plan at its sponsoring firm (327 firms sponsored the 421 plans in the sample). The plans within each category were generally assigned a multiplier that would gross the total liability in that funded status category to the total liability for the corresponding funded status category in the universe.

The historical data for years prior to 2010 was drawn from Form 5500 filing data provided by the PBGC. Plans that were not covered by the PBGC were excluded from the data. Amounts for 2008 and 2009 were estimated due to incomplete data for those plan years.

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