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## Defined Benefit Pension Plans and the Financial Crisis: Impact and Sponsors and Government Reactions

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## Defined Benefit Pension Plans and the Financial Crisis: Impact and Sponsors and Government Reactions

### Abstract

The global financial crisis of 2008-9 hit corporate defined benefit (DB) plans just as the new funding and other provisions of the Pension Protection Act of 2006 were being implemented. Both sponsors and the federal government reacted to the large shortfalls that developed. In this paper, the impacts and reactions are documented and the implications are evaluated. In particular, plans' funding status dropped dramatically, sponsors reduced risk in investments, increased contributions, and changed plan design, while premiums paid to the PBGC nearly doubled, and the federal government, through regulations and legislation, provided some temporary and/or conditional funding relief. Because the relief is temporary, and discount rates are projected to remain low, the shortfalls largely remain, dependent on future developments in financial markets. For the longer-term, the heightened appreciation for risk, as affecting both DB and defined contribution plans, has led to proposals for a new, more flexible, DB-like plan type called the flexible structured plan and other changes in government policies.

### Disciplines

Economics

### Comments

The published version of this Working Paper may be found in the 2012 publication: *Reshaping Retirement Security: Lessons from the Global Financial Crisis*.

# **Reshaping Retirement Security**

## **Lessons from the Global Financial Crisis**

EDITED BY

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Olivia S. Mitchell,  
and Mark J. Warshawsky

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## Chapter 9

# **Defined Benefit Pension Plans and the Financial Crisis: Impact and Sponsors and Government Reactions**

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*Mark J. Warshawsky*

The dramatic events of the global financial crisis and the great recession of 2008–9 affected many aspects of world economies, and corporate defined benefit (DB) plans in the United States were no exception. The most obvious and immediate impact showed up in plan funding rates: there was a dramatic decline and then a more gradual rise in equity prices, along with an initial large rise and then a gradual decline in corporate bond yields. As yields fell, plan liabilities increased. The finances of the government insurer of DB plans, the Pension Benefit Guaranty Corporation (PBGC), also worsened. But the longer-term impact of the global financial crisis is likely to be in the deeper appreciation of the high levels of risk inherent in the external economic environment. In turn, this will shape the long-term decision-making of corporate DB plan sponsors pertinent to investment policies, contributions, and plan sponsorship and design, as well as decisions by the federal government, including temporary funding relief to plan sponsors.

This chapter discusses how corporate DB plans fared during the global financial crisis, and how the main actors reacted. We begin with a detailed time line of legislative and regulatory temporary funding relief. We also review a reform proposal that arose out of this environment and experience recommending a new type of retirement plan and other changes in government policies.

### **Background**

To illustrate the backdrop against which this analysis unfolds, Figure 9.1 shows monthly and annual returns of the S&P500 for the period 2007–10, a period that bookends the great recession that began in December 2007 and ended in June 2009. The global financial crisis was most intense from

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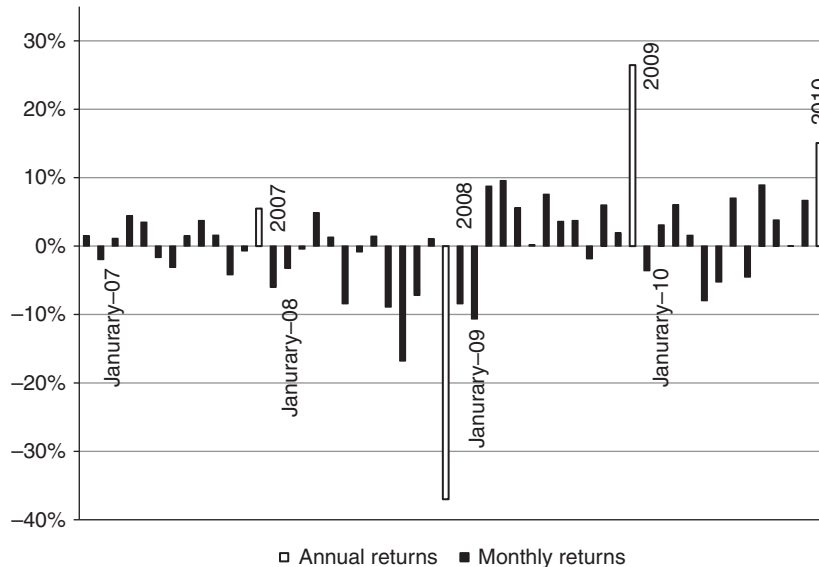


Figure 9.1 Total index monthly and annual returns, S&P 500 (%): 2007–10

*Source:* Author's computations using data from Haver DLX database, including monthly returns for the S&P from the years of 2007 to the end of 2010.

September 2008 through March 2009. Equity securities, represented by the S&P500, are a major asset class for pension funds; because of their generally high return, they also embody more risk. Figure 9.2 reports yields on high-grade corporate bonds at month ends, again for 2007–10. The series shown from the Internal Revenue Service (IRS) reflects a composite of rates on high-grade corporate bonds fairly representative of rates pension sponsors use for the purposes of financial accounting (and, within a range, for legal funding requirements in calculating their pension liabilities).

As the figures show, while equity returns were volatile in 2007, they were modestly positive. Beginning in 2008, however, larger losses began to accrue and September through November saw extremely large declines in prices. For the year, losses reached nearly 40 percent. January and February 2009 saw continued large losses, but then confidence was restored in the financial markets and, overall, the equity market in 2009 had a gain of more than 25 percent. There was continued volatility in 2010, but, on net, there was again a gain at over 15 percent.

Yields on high-grade corporate bonds generally follow those on long-maturity Treasury bonds, and were increasing through mid-year 2007 and



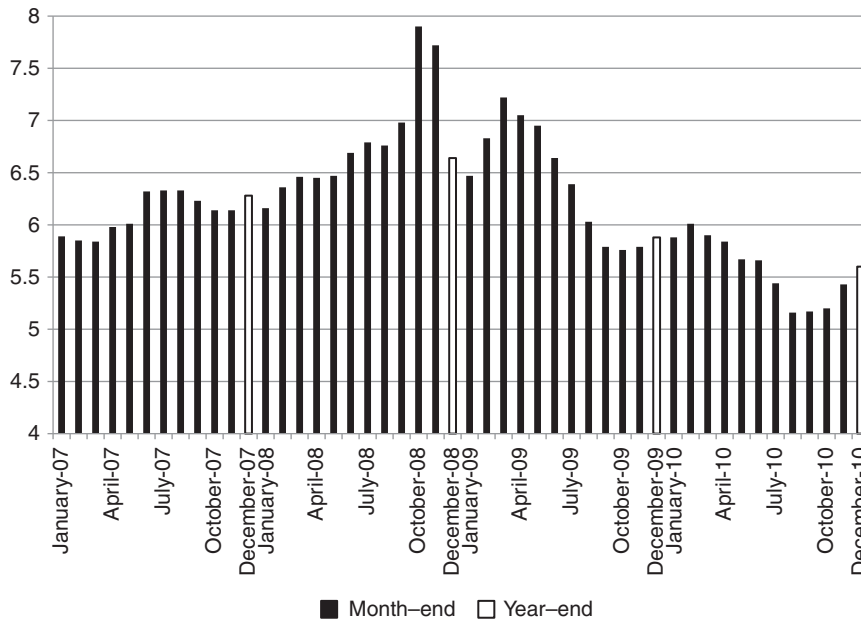


Figure 9.2 Composite Corporate Bond Rate (%): month-end, 2007–10

Source: Author's computation from the Internal Revenue Service (2011).

then began to decline with the onset of the recession. In 2008, however, that relationship broke, as spreads widened dramatically. Treasury bond yields fell while corporate bond yields rose dramatically in the depth of the financial crisis to nearly 8 percent (end of October 2008): during this period, investors doubted the creditworthiness of even the highest rated corporate issuers. Thereafter, corporate yields declined (although there was a bump-up in March 2009) until they were below 6 percent at the end of 2009 and around 5.5 percent at the end of 2010. Spreads with Treasury securities also narrowed significantly.

### Impact on corporate pension-funding status

The funding status of DB plans is calculated as the ratio of the market value of plan assets to liabilities (formally, the projected benefit obligation or PBO) for financial accounting year-end disclosures. This is the most immediate and sensitive summary measure of the plan's benefit security level, and it is widely cited and used. Figure 9.3 shows the history of the funding

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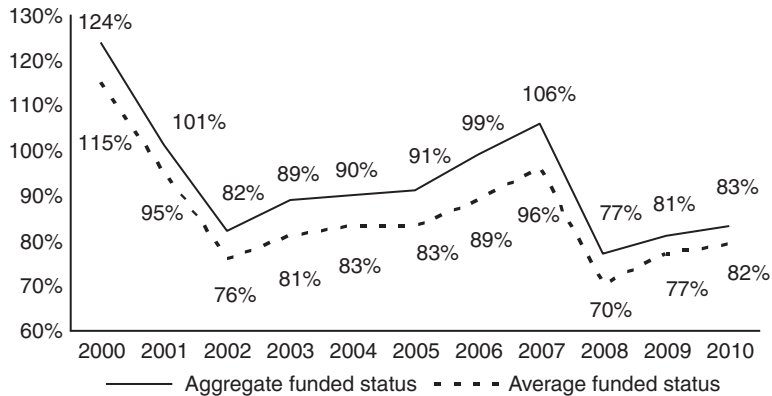


Figure 9.3 Pension funding status for Fortune 1000 companies: percentage per year 2000–10

Source: Author's computations using data from Towers Watson; see text.

status of the DB plans of Fortune 1000 companies 2000–10, on an aggregate basis (total of all plan assets divided by total of all plan liabilities) and also as a simple average across the companies (average of individual company pension asset–liability ratios). In 2000, the overall funding status was quite high at 124 percent, but it dropped during the dot-com bust, and the ensuing recession saw a low of 82 percent in 2002. Thereafter, there was a slow climb through 2007 when most plans were fully funded, only to experience the dramatic falloff in 2008 to an aggregate funding status of 77 percent and an average status of 70 percent. The years 2009 and 2010 saw some modest improvement. Though discount rates fell which boosted liabilities, there was also an increase in asset values; the estimated aggregate status was 83 percent in 2010 and average was 82 percent. Note that when the aggregate funding measure was uniformly higher than the average, it meant that larger plans were better funded than smaller plans.

A somewhat brighter view of the 2009–10 experience results from examining funding patterns across companies for fiscal years 2008 through 2010 (Figure 9.4). In 2008, almost one-quarter of companies had pension plans with a funding status of under 60 percent; by 2009, this share had declined to 10 percent, and in 2010 it declined further to 7 percent. On the other end of the spectrum, only 4 percent of companies had overfunded DB plans in 2008; by 2009, the percentage of overfunded plans improved a bit, to over 5 percent, and in 2010, it jumped to 10 percent.

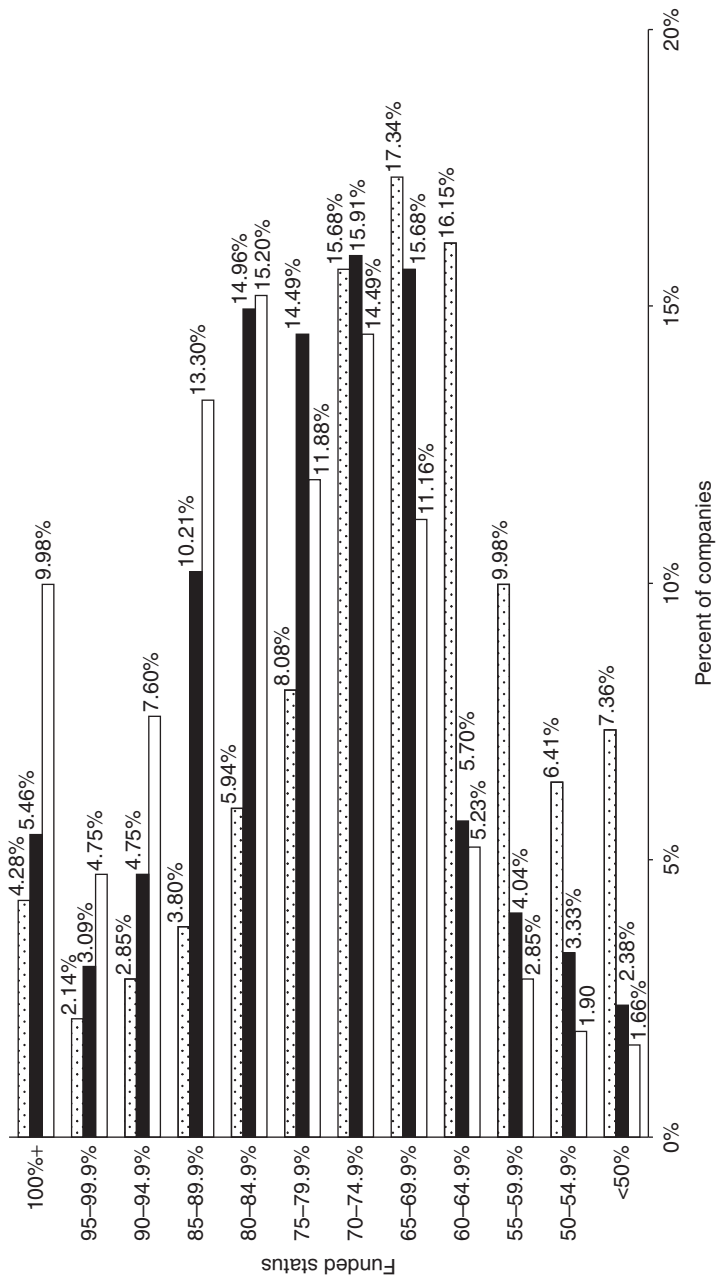


Figure 9.4 Funding status of defined benefit pensions offered by Fortune 1000 companies: 2008-10  
 Source: Author's computations from data from Towers Watson; see text.

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### Pension plan investments

Perhaps the easiest and most direct way for a plan to control cost and risk in its DB plan is through asset allocation. A higher allocation to equities not only lowers the plan sponsor's expected cost but also increases its risk, especially in the sense of more volatile required cash contributions. When DB plans are active and growing, equity investments make particularly good sense, as assets that increase with economic growth match liabilities that likewise increase with growth (more workers and higher wages). When DB plans are no longer growing or are closed or frozen—and mainly pay out benefits—many experts say that a better match is obtained when debt securities are the primary investment. These considerations should hold regardless of whether there is a bull or bear stock market. Even sophisticated professional and institutional investors, however, might be influenced by unusual realizations of risk, such as that which occurred during the global financial crisis. Overall, as we shall see, there has been a movement away from equity investments for DB plans. This pattern was apparent before the crisis, but it was deepened as a result.

Figure 9.5 shows the equity share for private DB plans from 1995 through 2010 taken from the Flow of Funds Accounts;<sup>1</sup> the equity share for private

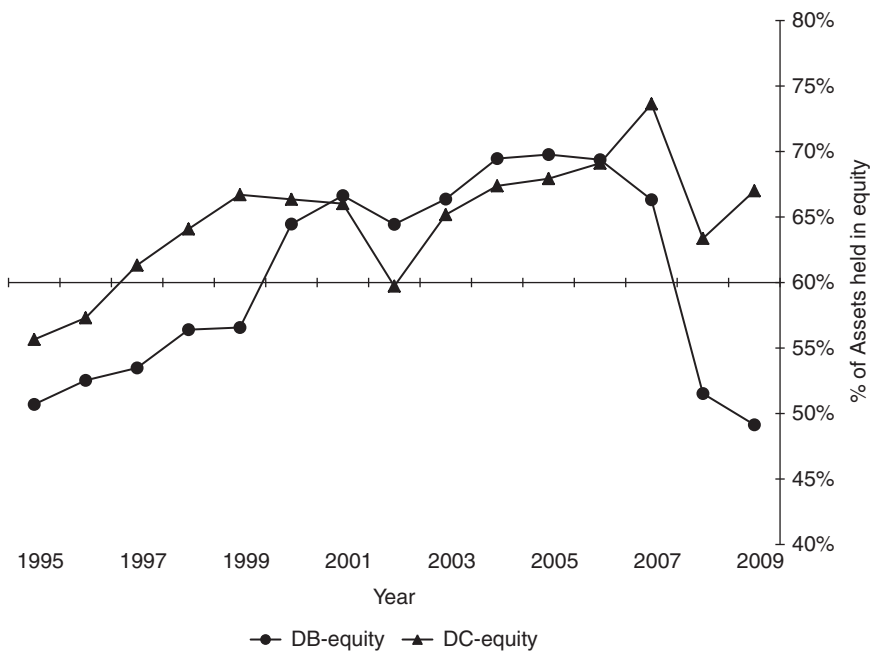


Figure 9.5 Equity shares for private DB and DC plan assets: 1995–2009

Source: FRB (2011).

defined contribution (DC) plans is also shown for comparison purposes. The DB equity share rose steadily from about 52 percent in 1995 to nearly 70 percent in 2005. There was a slight decline in 2002, likely reflective of equity price declines. Then, in 2006, the equity share for DB plans began to decline, more significantly in 2007, dramatically in 2008, and again in 2009, to only about 48 percent. In 2010, it declined again to 45 percent. While the decline in 2008 may be attributed at least in part to the massive and sudden meltdown in the stock market in the fourth quarter, the continued decline in share in 2009 and 2010 likely represents a conscious decision to reduce risk-taking, as equity prices rose in most of 2009 and 2010. The different behavior seen for DC plans makes this interpretation of a conscious move away from equities by DB plans more certain. While asset allocation mutual funds like target-date and balance funds are popular and growing, these still represent a distinct minority of assets and investors in DC plans. And it appears that most DC plan participants were passive investors and did not automatically rebalance their allocations. Indeed, the equity share in DC plans followed stock market movements closely over time, with some hint of an upward secular trend in the equity share. Overall, the equity share of DC plans has generally been higher than for DB plans, and in 2010, it was almost 20 percentage points higher than for DB plans.

Figure 9.6 shows a similar pattern based on data from large DB plan corporate sponsor annual reports.<sup>2</sup> In particular, the figure presents the aggregate average and the distribution of equity shares among plan sponsors 2005–9. Allocations to equity from 2005 to 2008 decreased from 62 to 44 percent, and they only recovered slightly to 45 percent in 2009. As further proof of the trend, fewer than 1 percent of large plan sponsors allocated less than 20 percent to equity in 2005, whereas more than 5 percent invested less than 20 percent in equities in 2008. Similarly, at nearly the other end of the spectrum, almost 9 percent of plan sponsors held 75–80 percent of plan assets in equities in 2005, but by 2009, fewer than 1 percent did so.

According to McFarland and Warshawsky (2010), other information sources indicate that equities have been a source of funding for both debt and alternative investments such as hedge funds and real estate in pension plans. More broadly, investment consultants in this field have been urging for some time that sponsors consider the liability structures of their plans and reduce risk, for example, through liability-directed investing, and this message is apparently getting through. Also, as McFarland and Warshawsky find, closed and frozen plans invest somewhat less in equities and more in debt securities; as such plans increase in number, aggregate allocations will also change in that direction.

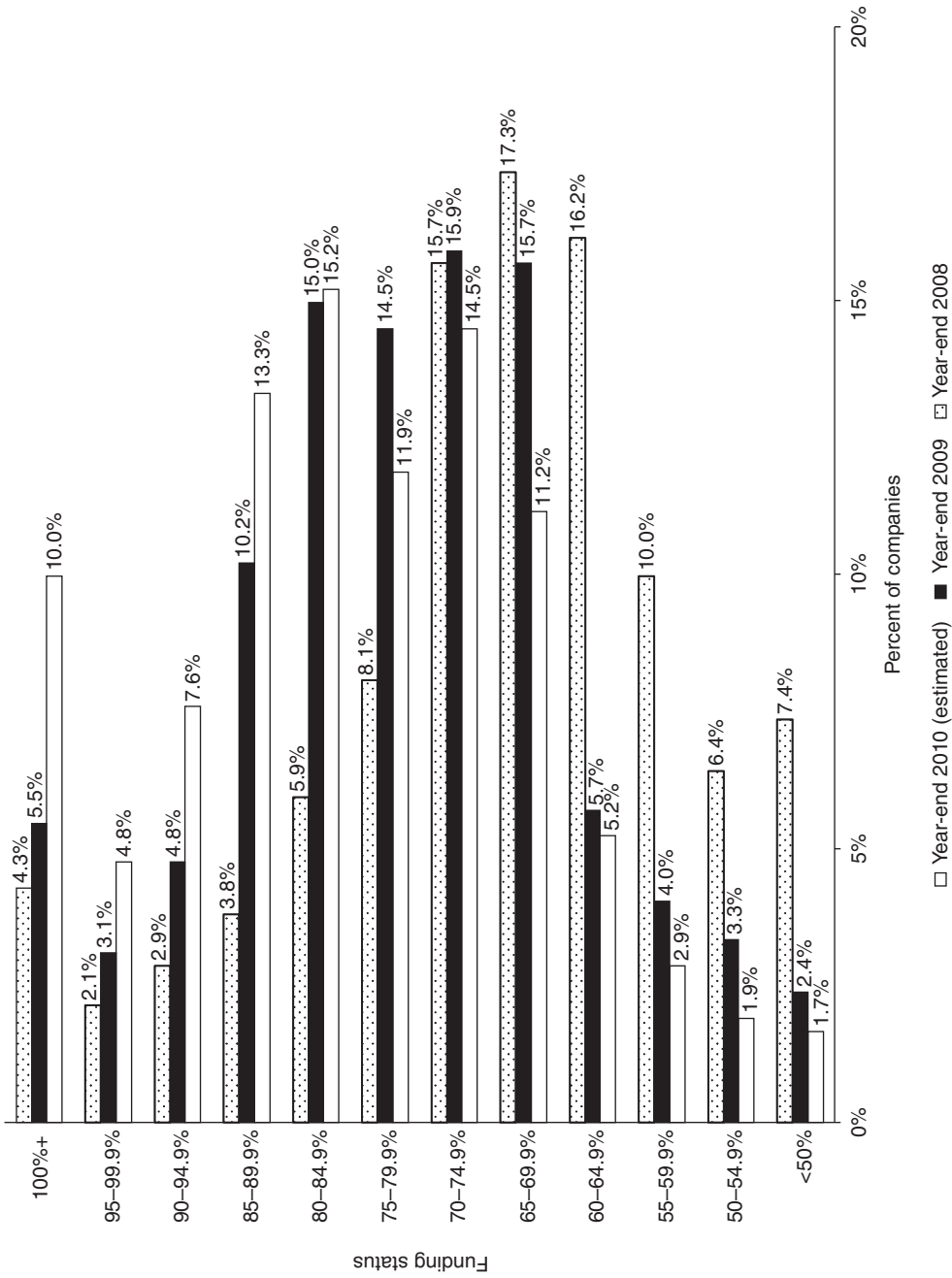


Figure 9.6 DB plan asset allocations to equities of Fortune 1000 companies: 2005-9

Source: Author's computations using data from Towers Watson; see text.

### Contribution patterns

Another way in which DB sponsors can react to financial market developments is through employer contributions to help fund the plan. The federal government sets a lower bound to these contributions, which it moves from time to time (Warshawsky, 2007). In particular, the Pension Protection Act of 2006 (PPA) implemented a regime whereby market conditions were ultimately better reflected in plans' regulatory funded status, and minimum required contributions were linked more explicitly and quickly to that status than in the past. These requirements are quite complex, and during the global financial crisis, they were temporarily altered to reduce the otherwise large minimum contributions that would otherwise have been required. At the same time, plan sponsors can contribute more than the minimum if it fits their business strategy and financial wherewithal; one of the accomplishments of PPA was to allow these extra contributions on a tax-deductible basis to a much greater extent than did prior law. Contributions can be either cash or employer securities (the latter within legal limits), but in practice the vast majority of contributions are made in cash.<sup>3</sup> There is evidence that many plan sponsors do pursue the strategy of contributing more than the minimum required.

Table 9.1 shows employer DB plan contributions by Fortune 1000 companies. These are mainly for single-employer qualified DB plans in the United States (though they also include non-qualified executive DB plans and foreign DB plans). The advantage of this data series, compared to the Form 5500 filed by individual plans with the federal government, is that it is available more quickly. Here, we see that contributions do follow plans' current funded status. In 1999, plan sponsors only contributed about \$11

TABLE 9.1 Employer contributions to corporate DB plans by Fortune 1000 companies: 1999–2009 (\$000 nominal)

Fiscal year	
1999	\$10,760,323
2000	\$16,685,625
2001	\$13,856,128
2002	\$44,351,971
2003	\$71,950,882
2004	\$52,305,607
2005	\$55,333,997
2006	\$44,775,654
2007	\$33,187,663
2008	\$35,920,612
2009	\$60,459,778

Source: Author's computations of data from Towers Watson.

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billion, but by 2003, contributions rose to nearly \$72 billion. Contributions then declined, and by 2007 had reached \$33 billion. In 2008, they rose to \$36 billion and in 2009 to more than \$60 billion. As explained below, contribution levels in 2008 and 2009 are clearly above the minimum required by law.<sup>4</sup>

### DB plan sponsorship and design

The long-term trend in sponsorship of active DB plans by large corporations represented here by the list of Fortune 100 companies from 1998 through May of 2011 appears in Table 9.2. These are, in turn, divided into traditional final-average-pay and career-average-pay plans on the one hand, and hybrid plans, mainly cash balance plans, on the other. Clearly, since 2004 the trend has been away from DB plans, particularly traditional plans. Although the trend continued and even accelerated in subsequent years, we do not sense that the global financial crisis per se caused that acceleration, despite the rapid drop-off in funded status in 2008 and increase in future funding obligations. Rather, it appears to be a continuation of a preexisting trend.

Pension plans in the United States are long-term commitments of the plan sponsor, by law and practice. Particularly for large corporations, they represent an important part of the compensation structure and a tool for workforce management, especially regarding turnover and retirement rates. Accordingly, there are many considerations when closing or freezing a DB plan, beyond the plan's current financial status. Moreover, because pension plans have a 'long tail' in terms of liabilities, even freezing all accruals immediately will not reduce a sponsor's risk exposure much for several years. Indeed, McFarland et al. (2009) showed that the announcement of a freeze or close generally led to slightly *lower* share prices for the plan sponsor, rather than an increase. Standard terminations of plans will take the risks off the books of plan sponsors, but they are expensive: the funding gaps must be made up immediately, and the extra charges by the insurer issuers of group annuity contracts to take on the accrued pension liabilities must be paid.

The obverse of risk exposure to the plan sponsor is risk protection for employees who better appreciate DB plans after a financial crisis (Towers Watson, 2010*a*). Moreover, once a decision has been made to move away from the DB plan, it may take several months or even years before it is implemented, owing to administrative, legal, and labor relations issues that must be managed. So there is reason to expect no sudden movements in DB plan sponsorship trends owing to the global financial crisis. Nevertheless, market events that highlight risk are likely to have an impact eventually. Prior to the financial crisis, plan sponsors said 'risk' was the most important reason given for a plan freeze or close (Watson Wyatt Worldwide,



TABLE 9.2 Retirement plans offered to newly hired employees by Fortune 100 firms: 1998–2011

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	May 2011
All DB pension plans	72	72	72	71	70	68	66	64	57	50	45	40	37	30
Traditional DB plan	64	59	58	53	47	40	37	36	33	29	22	20	17	13
Hybrid pension plan	8	13	14	18	23	29	29	28	24	21	23	20	20	17
DC plan only	28	28	28	29	30	31	34	36	43	50	55	60	63	70

*Note:* Sponsorship shown as the retirement plan offered to new hires at end of year through May 2011 (by the 2011 Fortune list of the 100 largest companies) and includes announcements for future plan changes 2011 and beyond.

*Source:* Author's computations of data from Towers Watson.

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2008). By all accounts, the global financial crisis was a realization of risk far beyond normal expectations—considerably beyond one standard deviation. Accordingly, ways to reduce risk while keeping the essence of the DB plan are likely to be more seriously explored and perhaps adopted.

Plan design is yet another important option for risk management (Pang and Warshawsky, 2011*b*). Cash balance hybrid plans represent less risk to a plan sponsor than traditional DB plans, in that for the latter, liabilities fluctuate with salary increases and service years. Moreover, these liabilities are also highly sensitive to changes in interest rates. By contrast, liability variations are mitigated in cash balance plans by their accrual formulas: usually the cash balance benefits are expressed as account balances at retirement, and the pay credit rate is fixed (e.g. 6 percent of pay). Cash balance accruals do vary with new realizations of crediting interest rates; for instance, the thirty-year Treasury bond yield is a frequently used crediting rate. In addition, liabilities for cash balance accounts are typically less interest rate-sensitive because the duration is shorter (account balances are usually paid out as a lump sum upon termination or retirement) and because of the internal partial hedging of the benefit accrual (being dependent on interest rate levels) and the liability. For example, declines in discount rates will not only increase the computed liability of a cash balance plan, but also gradually reduce plan benefits through lower interest credits. Pang and Warshawsky conclude that the cash balance plan has less expected volatility than the traditional DB plan and only slightly higher average cost, for the same 60/40 equity/bond investment strategy.

This lower risk may explain why hybrid plans have maintained a steadier share of plan sponsorship than traditional DB plans for Fortune 100 companies. The legitimization of these plans by PPA, after years of legal and political controversy, undoubtedly also played a part in steadying the overall environment for their sponsorship (Clark et al., 2012).

### **Temporary funding relief from the government**

As the depth and extent of the global financial crisis became apparent in late 2008, many policymakers, plan sponsors, pension community leaders, and analysts began to worry about the impact of the drop in equity values and interest rates on the funded status of single-employer DB plans.<sup>5</sup> In particular, at a time of massive layoffs, hiring freezes, and the big drop in corporate plant and equipment investment, they grew concerned about the call on corporate cash arising from the impact of the legal funding obligations under PPA requirements. These requirements, first imposed for 2008 plan years, require the plan sponsor to face a seven-year amortization period for measured funding losses. These funding losses, in turn, are

broadly reflective of market conditions for both asset and liability values. There are, however, many transition rules, and special definitions, including some allowed smoothing of values and so on, that make an accurate picture of the actual law requirements quite complicated, as we shall see later. Indeed, this complexity is a key part of the story of how temporary funding relief was accomplished in various stages.

The first response to the crisis was to provide some limited relief as part of a legislative package of technical corrections to PPA, through the Worker, Retiree, and Employer Recovery Act of 2008 (WRERA, 2008). To avoid a cliff-like effect funding requirement, this new bill relaxed PPA's transition rule for phasing in liability targets, and it allowed a look back for the restriction on benefit accruals on severely underfunded plans. In addition, WRERA allowed plans to use twenty-five-month asset-smoothing with an assumed earnings rate to determine the actuarial value of assets, generally increasing values.<sup>6</sup> This technical change, while directly of relatively small consequence, did later allow regulators to grant significantly more temporary relief.

Pang and Warshawsky (2009*b*) estimated that for the 2008 plan year (for most plans, at the end of calendar year 2007), the average regulatory funded status was 97 percent and the aggregate of minimum required contributions was \$38 billion. But this relatively benign situation was upended by the financial crisis: for the 2009 plan year, they projected that the average funded status had declined to 75 percent and contributions would increase dramatically to \$125 billion under PPA. Some relief was provided by WRERA; because of it, required contributions were projected to be instead \$108 billion. The 2010 plan year was likely to be extremely challenging, as the average funded status would only improve to 80 percent and required contributions to \$103 billion.<sup>7</sup>

With the passage of WRERA, plan sponsors lobbied the IRS to allow for changes in valuation elections, arguing that (had they been aware of the law change) they would have made different elections in 2008.<sup>8</sup> These allowances for different valuation methodologies improved the average funded status to 94 percent in 2009 and reduced the required contribution to only \$32 billion (Pang and Warshawsky, 2009*c*). In plan year 2010, it was anticipated that average funded status would be 84 percent and required contribution would be \$89 billion. These figures, of course, represent considerable improvements and relief compared to the situation as projected in January 2009. Yet plan year 2010 still represented a large increase in required contributions, and plan year 2011 a massive increase. The average funded status was expected to fall to 77 percent and required contributions jump to \$147 billion in 2011 (Pang and Warshawsky, 2009*c*).

This led plan sponsors and their trade groups to seek further temporary relief. Eventually, Congress assembled a package that was responsive to sponsor concerns, including extending the time period of relief, but it was

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still only limited and conditional. This legislation, called the Access to Care for Medicare Beneficiaries and Pension Relief Act of 2010 (ACMBPRA), was signed by President Obama in 2010. Under ACMBPRA, sponsors of underfunded DB plans may elect either a ‘2+7’ rule or a fifteen-year amortization rule for losses incurred in any two plan years between 2008 and 2011. Under the 2+7 rule, the sponsor makes interest-only payments for two years, followed by the regular seven-year amortization schedule. Under the fifteen-year rule, the sponsor amortizes the funding shortfall over fifteen years. Also, the relief from freezing benefit accruals for severely underfunded plans was extended to the 2010 plan year. The legislation conditioned this relief, however, on a so-called cash flow rule, that is, relief recipients must make higher pension contributions if they pay ‘excess’ employee compensation, declare extraordinary dividends, or redeem company stock in excess of certain thresholds. The condition period is three years for the 2+7 rule and five years for the fifteen-year rule.

Models of the relief provisions using updated market conditions and assumptions suggested that if all underfunded plan sponsors chose the 2+7 rule for the 2010 and 2011 plan years, then required contributions would be only \$66 billion in 2010 and \$96 billion in 2011, a reduction of \$47 billion for those two years compared to pre-ACMBPRA law (Pang and Warshawsky, 2010). By 2012, however, required contributions would jump to \$147 billion in this scenario. By contrast, election of the fifteen-year amortization by all underfunded plans for the 2010 and 2011 plan years would provide lesser relief in 2010–11 but more through 2013—a \$63 billion reduction in required contributions over the longer period. Subsequent surveys have indicated that the extent of utilization by plan sponsors of the latest legislative relief will be somewhat limited (Towers Watson, 2010*b*). Only about 30 percent of plans will use any relief, although the more severely underfunded plans are more likely to do so. Of those electing relief, most will use the fifteen-year amortization rule for the 2010 and 2011 plan years, which maximizes the longer-term relief but minimizes the immediate impact. The cash flow rule conditions are apparently discouraging some sponsors; with economic and financial conditions finally improving in late 2010 and early 2011, other plan sponsors preferred to bite the bullet and make extra contributions to improve funding status.

On updating the projections in January 2011, Pang and Warshawsky (2011*a*) included actual contributions in 2008 and 2009 (Table 9.3) and discovered that contributions were considerably in excess of the minimum required contributions. Nevertheless, declines in interest rates during 2010 worsened projected funding and increased required contributions compared to earlier projections. Indeed, in the 2011 plan year, required contributions increased to \$163 billion, and to \$175 billion in 2012, before declining to still high levels of \$149 billion in 2013 and \$136 billion in 2014,

TABLE 9.3 Estimates and projections of DB corporate plan funded status and required minimum contributions: 2008–14

Plan year	A. Pre-Relief Act without funding relief				B. Relief Act with estimated elections			
	Funded status (%)		Contribution (\$b)		Funded status (%)		Contribution (\$b)	
	Actual	Minimum	Actual	Minimum	Actual	Minimum	Actual	Minimum
2008	95.3	37.1	77.9	37.1	95.3	77.9	37.1	
2009	94.6	24.7	92.1	24.7	94.6	92.1	24.7	
2010	88.8	91.2		91.2	88.8		88.6	
2011	77.5	163.0		163.0	77.4		155.3	
2012	79.8	175.4		175.4	79.4		170.5	
2013	87.1	148.5		148.5	86.5		147.3	
2014	91.3	135.5		135.5	90.6		135.8	

Note: Author's estimates of actual contributions based on Form 5500 and financial disclosure data.

Source: Author's computations of data from Towers Watson.

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without considering funding relief (Panel A). Because of the limited take-up of any of the relief choices, the 2010 legislative relief is not projected to have much of an impact on these numbers (Panel B).<sup>9</sup>

### The PBGC single-employer insurance program

The corporate DB pension sector in the United States is protected by the PBGC. For several reasons, it is to be expected that the global financial crisis would have hurt this entity's assets and liabilities, and also increased the number of terminated underfunded DB pension plans resulting from corporate bankruptcies. This did occur, but perhaps to a lesser extent than what one might have expected given the severity of losses in financial markets and the depth of the overall recession.

Table 9.4 shows the net position of the PBGC single-employer insurance program, defined as the difference between its total assets and total liabilities, from 2001 through 2010 (fiscal years). Assets are mainly investment funds controlled by the PBGC, amassed over the years from the assumption of corporate plans terminated in distress. Similarly, liabilities are mainly the present value of future benefits accumulated over the years from terminated plans. From 2007 to 2010, the net position of the program declined from  $-\$13.1$  billion to  $-\$21.6$  billion. This was indeed a worsening in the financial situation of the program to be sure, but not nearly the extent of decline as occurred from 2001 to 2004, from  $\$7.7$  billion (a surplus!) to  $-\$23.3$  billion, nor reaching as deep a level, even though the program's exposure rose over time due to growing corporate pension liabilities.

This cushioning of the PBGC financial situation in 2008 and 2009 can be explained in part by the extraordinary support given by the federal

TABLE 9.4 Pension Benefit Guaranty Corporation (PBGC) single-employer insurance program: net position, 2001–10 (\$m)

Fiscal year	Total assets	Total liabilities	Net position
2001	\$21,768	14,036	7,732
2002	\$25,430	29,068	(3,638)
2003	\$34,016	45,254	(11,238)
2004	\$38,993	62,298	(23,305)
2005	\$56,470	79,246	(22,776)
2006	\$59,972	78,114	(18,142)
2007	\$67,241	80,352	(13,111)
2008	\$64,612	75,290	(10,678)
2009	\$68,736	89,813	(21,077)
2010	\$77,827	99,421	(21,594)

Source: Author's computations from PBGC Annual Reports (2001–10).

government and the Federal Reserve to specific financial and nonfinancial companies in severe distress during the recent global financial crisis. Assisted companies thereby avoided the need to turn over their underfunded pension plans to the PBGC. The entity's change in net position can be explained more specifically by the finances of annual operations shown in Table 9.5 for fiscal years 2007–10. Premiums plus investment income (or less losses) less actuarial charges (or plus credits) less losses from completed and probable terminations (or plus credits) less administrative and investment expenses equals the net income (loss) for the year; this is identical to the change in net position. Premium income, owing to a provision in PPA, now increases when the funded status of corporate pension plans deteriorates; this was evident in 2009 and 2010, when premiums paid to the PBGC nearly doubled. Investment income reflects the performance of the PBGC portfolio; as we will see in the next table, the portfolio does include equity holdings, as well as debt and cash, and therefore is subject to financial market fluctuations. Returns were negative in 2008 and positive in 2009 and 2010.

Actuarial charges should generally be positive, owing to the passage of time, but in fact they show big swings across the zero line over time, mainly caused by changes in the discount rate applied to the calculation of the present value of future benefits owed by the PBGC. This volatility was particularly evident in 2009, and losses from terminations were also substantial that year. It should be noted, however, that, complying with generally accepted accounting rules, the PBGC reflects probable terminations of underfunded plans on its books and sometimes reverses those entries when specific corporate financial situations turn around unexpectedly.

Table 9.6 provides us with some key indicators for the PBGC single-employer insurance program, including the number of underfunded plans newly terminated and the net loss in billions from actual plan terminations

TABLE 9.5 Pension Benefit Guaranty Corporation (PBGC) single-employer insurance: annual operations, 2007–10 (\$m)

	Fiscal year			
	2010	2009	2008	2007
Premium and other income	\$2,261	\$1,838	\$1,363	\$1,531
Investment income (loss)	7,594	6,330	(4,164)	4,737
Actuarial charges and adjustments (credits)	9,421	13,901	(4,813)	346
Losses (credits) from completed and probable terminations	509	4,234	(826)	399
Administrative, investment, and other expenses	442	432	405	492
Net income (loss)	(517)	(10,399)	2,433	5,031

Source: Author's computations using data from PBGC (2007–10).

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that year. These indicators clearly worsened in 2009–10. Another critical determinant is the interest rate factor used in valuing PBGC liabilities. As the interest rate factor declined from 6.66 percent in 2008 to 4.41 percent in 2010, the value of PBGC liabilities (which have long durations) increased substantially.

It should also be noted that the PBGC changed its valuation methodology during this period. Currently, the PBGC surveys life insurance industry group annuity indicated prices through the American Council of Life Insurers (ACLI) to obtain input needed to determine interest factors used in valuing pension liabilities and then derives interest factors that will best match the prices from the surveys. Despite its importance to the reported net position of the program, that survey apparently is not audited by the PBGC's accounting firm. Further, the prices from the survey are not necessarily reflective of actual market transactions, nor is the sample of companies surveyed necessarily large and consistent. Prior to 2009, the PBGC had also used an aggregate bond index in 'the mix' of its determination of interest factors, but it discontinued that practice because 'significant volatility in the bond markets led PBGC to research the relationship between quarterly bond yields and annuity prices' (PBGC, 2010: 67).

In January 2006, with a change in mortality tables (due to lower mortality rates), the PBGC increased its interest factors by 170 basis points. Comparing PBGC rates with corporate bond rates over the period 2001–10, two distinct periods are notable. During 2001–5, PBGC rates were lower but they were highly correlated ( $R^2 = 0.9151$ ) with market rates measured by the Composite Corporate Bond Rate (CCBR). In the second period, however, the correlation with market rates is much lower ( $R^2 = 0.6509$ ), while PBGC rates are still below the CCBR. Warshawsky (2009) has suggested that the PBGC should instead use the corporate bond yield curve calculated by the Treasury Department and employed by many corporate pension plans, as the basis for the calculation of its pension liabilities. This may be a more

TABLE 9.6 Pension Benefit Guaranty Corporation (PBGC) single-employer insurance program: key indicators

	Fiscal year		
	2010	2009	2008
New underfunded plans terminated	147	144	67
Net loss from terminations (\$b)	1.44	5.83	0.27
Interest rate factor (%)	4.41	5.17	6.66
Return on investment portfolio (%)	12.1	13.2	6.5
Equity share in investment portfolio (%)	31.1	37.2	27

Source: Author's computations using data from PBGC (2008–10).



transparent and accurate methodology in the determination of interest rate factors underlying reasonable estimates of current group annuity prices.

As also seen in Figure 9.7, the return on the PBGC investment portfolio is somewhat volatile and reflects financial market conditions. During 2008–9, the PBGC increased its exposure to the equity market, but then in 2010 it brought that exposure back down. These changes reflect mainly changes in the PBGC Board’s investment policy determined by its trustees, the Secretaries of Labor, Treasury and Commerce, and as suggested by the Executive Director.

The 2012 proposed federal government budget released by President Obama in February 2011 included a plan to increase PBGC premiums to make them reflect the riskiness of the pension plan and the plan sponsor, and to give the PBGC Board the authority to set the premium rate. The budget indicated that this proposal would raise \$16 billion over ten years, although it would not start for two years. Assuming that the stated increase in revenues represented just an increase in premiums (no details were given), this would represent nearly a doubling in annual premiums from current levels.

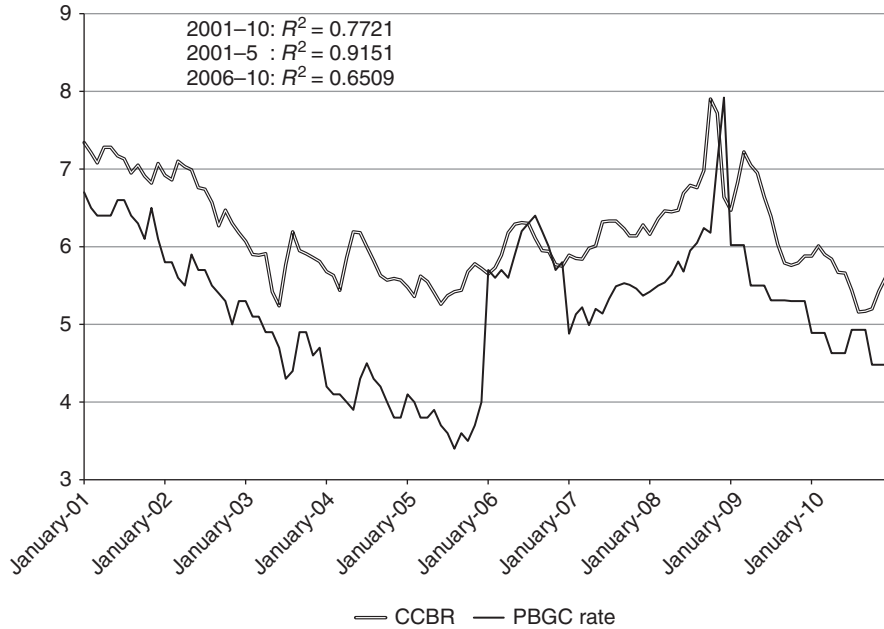


Figure 9.7 Composite Corporate Bond Rate (CCBR) and PBGC rates: 2001–10  
 Source: Author’s computations from PBGC (2011).

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### Reform proposals

Another way to reduce risk imposed on plan sponsors is to change certain laws that currently constrain risk management in, and therefore increase the risk of, DB plans. Indeed, in light of the global financial crisis, several analysts have recently put forward reform proposals to better enable the management and sharing of risk between plan sponsors and participants. For example, the Society of Actuaries Retirement 20/20 initiative sponsored a conference in 2010 where several proposals were presented, emphasizing new third-party institutions and the DC approach (Kessler and Peterson, 2010).

Another such proposal offers a new type of single- or multiple-employer retirement plan, namely something called a *flexible structured* plan (Warszawsky, 2010). It has the basic features of a DB plan, but the plan sponsor can cut back benefits according to a specified legal rule if the plan funding falls severely, and it must increase benefits if plan funding rises significantly. No reversion of excess assets would be allowed here. This type of plan is intended to share investment risk and return between employers and employees. The proposal would also apply a uniform standard of benefit adequacy on plan design and operation based on certified retirement saving models, with appropriate differentiation for the different plan types, with the structure intended to encourage guaranteed benefits. Non-discrimination requirements could then be eliminated as essentially redundant, according to the proposal. Other changes in plan rules and provisions include a reform of the reversion tax for DB (both traditional and hybrid) plans, intended to right the risk imbalance inherent in the sponsorship of these plans currently. Additionally, PBGC accounting for its liabilities would be revamped, to improve transparency. The various limits on benefits and contributions to plans would be indexed to wages, rather than prices—it is claimed that this is policy consistent with sensible plan design because plans are intended to replace preretirement wages, not prices, and because the relative position of plan limits in the income distribution is more likely to be maintained, rather than slowly erode, keeping the active interest of sponsor owners and executives.

### Role of the employer

Unlike some other recent proposals, this proposal builds on the current employer-based system; accordingly, the current voluntary nature of the second-tier retirement system would continue. Retirement plan sponsorship would not be required by employers, nor would a plan need to be fully paid by employers. Accordingly, incentives under the proposal are designed to be consistent with the encouragement of plan sponsorship, as

well as adequate and secure benefits; the goal is to produce a level playing field among plan types, while assuring plan participants and broader society that their needs and concerns are also addressed. An important consideration and even constraint for its success would be a continued sustainable interest by employers in retirement plans.

The *flexible structure plan* has the basic features of a DB plan and therefore the retirement benefits would be specified. The sponsor, however, would be allowed to implement certain specified benefit cutbacks, across the board in percentage terms, to all participants not currently receiving payments from the plan or not older than the plan's normal retirement age, from the currently indicated level of benefits, if the plan funding, specially defined, fell below certain thresholds. As a counterpart, plan improvements, again distributed evenly and proportionately across the board to participants not receiving benefits, would be required from the current benefit level if the plan funding increased above certain thresholds. No reversions of excess pension assets would be allowed for this plan type.

Any unilateral or bargained improvements in future benefit accruals for a flexible structure plan, unrelated to funding status, could be made proportionally among participants, not favoring any group, on a going-forward basis. Benefit improvements for past service, however, could only be made if they were funded fully. Benefit cutbacks would not be allowed except in response to declines in funding status.

For this purpose, funded status would be defined as the ratio of plan assets to plan liabilities, where the present value of benefits accrued to participants receiving payments or older than the plan's retirement age is subtracted from both the numerator and denominator. Plan assets and liabilities would otherwise follow the definitions and valuation requirements in current law.

The cutback–enhancement regime for this plan type has several elements. Within a corridor of funding statuses around the current plan liability (say, 80–120 percent), the current funding requirements operate; that is, normal cost must be covered, any shortfalls must be amortized over seven years, but no benefit improvements are required. The corridor provides stability of benefits to plan participants most of the time, while imposing only modest volatility on plan sponsors. If the funding status were to fall below the corridor, the benefit liability may be reduced, according to a rule considered below (flexible). Normal cost is still paid, and the corridor is reset around the new liability. Benefit reductions are limited: if the current liability falls below 50 percent of the initial liability, there can be no further cuts, and contributions must be made to amortize losses so that at least 50 percent of the initial liability will be paid to plan participants. Above the corridor, benefit improvements must be made, again according to one of the rules discussed below; the rules generally give

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symmetrical treatment to cuts and improvements. The new liability is calculated and the corridor is moved around it. Finally, normal cost relates to the current accruals of the plan, which are dependent on the plan's fixed design (structured) and not to its funding status. The plan would offer a life annuity as a distribution option.

Contributions would be made by the employer in the new plan type. Mandatory employee contributions would not be allowed because the participants do not control the plan investments. As a retirement instrument where the worker shares to some extent the results of the plan's performance, voluntary employee contributions to the plan would be allowed to purchase extra benefits, on a tax-deductible basis, comparable to the treatment of 401(k) plans.

This proposal considers alternative cutback–enhancement rules (regimes), with somewhat different risk-sharing properties. One possibility would set the corridor at 80–120 percent; if outside the corridor, cuts and increases in benefits would be made *pari-passu* with funding status changes below or above the corridor (i.e. according to the distance outside the corridor). For example, if the funding status fell to 75 percent of the current liability, a 5 percent cut could be made to the benefits, and the corridor would move downward around the new, lower benefit liability. Normal cost must be paid, as well as any amortizations of past losses. Cuts may continue to be made, as warranted by funding status changes, but benefits cannot fall below 50 percent of the initial promise. If the funding status rose to, say, 130 percent, a 10 percent 'permanent' increase to benefits must be made, and the corridor would move upward around the new benefit liability.<sup>10</sup> It is therefore argued that this change could reduce the risk inherent in the sponsorship of these plans currently, perhaps renewing the interest by plan sponsors in DB plans. In the context of the overall proposal, the change in excise tax is intended to help achieve 'an even playing field' in the costs, burdens, and advantages for sponsors and participants among the three plan types in the new, reformed, retirement system.

The team has also explored having the PBGC use market interest rates as the discount rate used to value its obligations (instead of the current practice of basing it on insurance industry surveys). Specifically, the idea is to use the high-grade corporate bond spot 'yield' curve calculated by the Treasury Department in a highly transparent manner, with appropriate adjustments for agency expenses, to arrive at good estimates of group annuity prices and to be used in calculating the finances of the PBGC, both income statement and balance sheet. The purpose of this change is to bring more transparency and accuracy to the accounting for the insurance program. And finally, the proposal posits that the indexation of the various limits on all types of qualified retirement plans should be made to the average wage computed by Social Security, rather than the consumer price

index. In addition, levels should be increased as Social Security is reformed, presumably becoming even more progressive, to maintain a fair balance between public and private programs for retirement.

### **Conclusion**

The global financial crisis hit corporate DB pension plans hard. Asset values declined dramatically as the stock market was shocked in late 2008 and early 2009. Interest rates used to value pension liabilities rose initially in late 2008, but then they declined steadily over the next two years. As a result, the funding status of plans declined quickly, from 106 percent in 2007 to 77 percent in 2008, before recovering somewhat to 83 percent in 2010. Plan sponsors curtailed their investment portfolio risk (moving away from equities), increased contributions (even above legal minimums), and froze and closed traditional DB plans, continuing trends already evident before the financial crisis. The federal government provided several types of funding relief, both legislative and regulatory. Some reforms were substantial, for the 2009 plan year in particular, in that even the high level of contributions actually made was below what would otherwise have been required. In any case, the relief was temporary, and required contributions will increase significantly in the foreseeable future unless discount rates rise significantly or asset markets boom.

Clearly, there remains much risk and fragility in financial markets and the economy, perhaps more than countenance prior to the global financial crisis. Plan sponsors are reluctant to bear the entire risk burden, yet workers and retirees still want structured benefits and desire guaranteed benefits. Accordingly, to encourage the activities of plan sponsors, and to better manage risk, fairly and efficiently, while still providing structured benefits to workers, it is useful to evaluate new plan designs that can more fairly and efficiently spread the risk burden between sponsors and workers. Ultimately, the goal would be to ensure that workers can retire at appropriate ages in reasonable comfort and at reasonable cost.

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### Endnotes

1. Two fairly ready and current sources of information exist on investment patterns of private DB (and defined contribution or DC) plans. The first, from the Flows of Funds Accounts of the Federal Reserve Board (FRB, 2011), provides data on flows and outstanding amounts, by asset classes, on a quarterly basis. As of this writing, the most recent data available is for third quarter 2010. A drawback to this source is that single-employer and multiemployer plans are reported together, although assets of single-employer plans generally represent more than three-quarters of the total for DB plans. Another drawback is that these data are estimated from various underlying sources; the estimates change for several quarters until no further revisions are made. The second information source, from disclosures in the annual financial reports of corporate plan sponsors, provides detailed data on asset holdings by class and valuation methodology on an annual basis. Recent changes in financial accounting standards made these disclosures more granular and accurate. Yet one drawback is that the data are reported and collected with a lag; another is that the collections do not represent the universe of single-employer plans. As of this writing, the most recent financial disclosure data are available for year-end 2009 for Fortune 1000 companies (collected by Towers Watson). Despite their differences, the two sources are largely consistent in the story they tell about trends, changes, and the influence of the global financial crisis on DB plan investments.
2. These are the Fortune 1000 companies with calendar-year financial statements for which Towers Watson has consistently obtained data.
3. Kummernuss et al. (2010) offer evidence that contributions of employer securities actually declined during the global financial crisis.
4. Data on contributions actually made on which we base our modeling of future funding obligations come from Schedule SB of the Form 5500 through 2008 for the universe of plans; for 2009, it is from the financial disclosure data for larger companies reported above, adjusted for average relationships with the Schedule SB data.
5. See Mazo and Greenblum (2012) for a discussion of the impact of the financial crisis on multiemployer pensions.
6. This smoothing is somewhat limited though, such that the assumed earnings rate cannot exceed the third segment rate mandated by PPA for valuing benefits starting in fifteen or more years, and overall computed values are subject to the asset corridor test; that is, that the actuarial asset value must fall within 90–110 percent of the fair market value.
7. Pang and Warshawsky (2009*b*) assume that most plan sponsors elected to use the market value of assets in their required funding calculation and a smoothed actuarial value of liabilities (as allowed by PPA), using three segment discount rates averaged over the past twenty-four months. This is because plan sponsors did not want to use the simple twenty-five-month average of past asset values without also gaining the ability to assume some expected investment return over the averaging period on the expectation that generally market prices, particularly of equities, tend to rise over time. So, according to the model, the WRERA provision allowing asset smoothing then had little direct impact on expected funding obligations, without an ability to switch valuation methodologies. If,

however, plan sponsors would switch their valuation elections to maximize asset values and minimize liability values, funding obligations for the 2009 plan year would be considerably reduced. In particular, smoothed asset values and market value of liabilities (using the temporarily high corporate bond yields as of October and November 2008) would provide considerable funding relief. Under law and regulation, sponsors are generally only allowed to change valuation elections once every five years without permission from the IRS; hence, Pang and Warshawsky initially assumed that plan sponsors would be reluctant to choose such a ‘mismatched’ valuation methodology, part smoothed and part market, and to be locked in to that choice. Choosing consistent valuations (all smoothed or all market, but mostly all smoothed), these methodologies were estimated to improve the average funded status to 80 percent in plan year 2009 and to 85 percent in plan year 2010, and to reduce required contributions to \$91 billion in 2009 and to \$84 billion in 2010.

8. In March 2009, the IRS announced that plans would be allowed to make a change, without the need to ask for permission from the IRS, so that ‘for a calendar year plan with a January 1, 2009 valuation date, the IRS will not challenge the use of the monthly yield curve for January 2009, or any of the four months immediately preceding January 2009’. In September 24, 2009, the IRS said that regulations would provide for ‘automatic approval for a new choice of interest rates for the first plan year beginning in 2010’. Hence, according to internal Watson Wyatt surveys, most plan sponsors felt comfortable in choosing a smoothed asset valuation and market liability valuation for the 2009 plan year, with the ability to switch again in 2010 or later.
9. It should also be noted that multiemployer plans were also subject to new PPA requirements and got considerable funding relief (Mazo and Greenblum, 2012).
10. A specific provision in the overall proposal intended to encourage the maintenance of guaranteed DB plans (not applied to flexible structured plans) is also modeled by Pang and Warshawsky (2009*a*), which would lower the excise tax rate to 20 percent (instead of the current 50 percent) and allow excess asset reversions to employers for DB plans funded at least at 120 percent of their liabilities. As in current law, sponsors would have to fully vest accrued benefits if they took reversions, though they would not have to terminate their plans. Also, the proposal includes a lower excise tax rate—15 percent—on asset reversions in bankruptcy, instead of the 20 percent under current law. The excise tax rate chosen reflects some past research that finds the rate needed to capture the corporate income tax otherwise avoided by the exclusion of pension fund investment income from taxation. Corporate income taxes would also need to be paid on the asset reversions. The model results indicate that a more moderate excise tax rate together with a reasonable funding threshold for asset reversions would enable sponsors to spend the excess funds on other corporate needs, thereby lowering the cost of sponsorship of DB plans. It would also open a considerable revenue source for the government, with only a small increase in bankruptcy cost for the PBGC.

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### References

- Board of Governors of the Federal Reserve System (FRB) (2011). *FRB: Z.1 Release—Flow of Funds Accounts of the United States*. Washington, DC: FRB (June–July).
- Clark, R., A. Glickstein, and T. Hill (2012). “Adopting Hybrid Pension Plans: Effects of Economic Crisis and Regulatory Reform”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- Internal Revenue Service (IRS) (2011). “Composite Corporate Bond Rate Table”, 5 August. Washington, DC: IRS. <http://www.irs.gov/retirement/article/0,,id=123229,00.html>
- Kessler, E. and A. Peterson (2010). “The Amazing Transformation of Retirement”, *The Actuary*, October/November: 25–29.
- Kummernuss, E. B. McFarland, and M. J. Warshawsky (2010). “Company Securities in Pension Plan Assets”, *Towers Watson Insider*, n.p. New York, NY: Towers Watson (December).
- Mazo, J. F. and E. Greenblum (2012). “Multiemployer Pension Plans in the Financial Crisis”, in R. Maurer, O. S. Mitchell, and M. J. Warshawsky, eds., *Reshaping Retirement Security: Lessons from the Global Financial Crisis*. Oxford, UK: Oxford University Press.
- McFarland, B. and M. J. Warshawsky (2010). “Asset Allocations of Corporate Pension Plans in 2009”, *Towers Watson Insider*, 20(11): 1–6. New York, NY: Towers Watson (November).
- , G. Pang, and M. J. Warshawsky (2009). “Does Freezing a Defined-Benefit Pension Plan Increase Company Value? Empirical Evidence”, *Financial Analysts Journal*, 65(4): 47–59.
- Pang, G. and M. J. Warshawsky (2009a). “Reform of the Tax on Reversions of Excess Pension Assets”, *Journal of Pension Economics and Finance*, 8(1): 107–30.
- and — (2009b). “The Future of DB Funding Under PPA, the Recovery Act and Relief Proposals”, *Watson Wyatt Insider*, 19(1): 1–6 (January).
- and — (2009c). “Funding for DB Pension Plans in 2010 and 2011 Under Relief Proposals”, *Watson Wyatt Insider*, 19(10): 1–4 (October).
- and — (2010). “Single-Employer DB Plan Funding Obligations Under 2010 Funding Relief”, *Towers Watson Insider*, 20(7): 1–4. New York, NY: Towers Watson (July).
- and — (2011a). “Funding Obligations for Single-Employer DB Pension Plans: Updated Projections for 2011–2014”, *Towers Watson Insider*, n.p. New York, NY: Towers Watson (March).
- and — (2011b). “Comparative Costs and Risks for Sponsors of Traditional Defined Benefit, Defined Contribution and Hybrid Plans”, Towers Watson Working Paper. Washington, DC: Towers Watson (February).
- Pension Benefit Guaranty Corporation (PBGC) (2001). *Annual Report*. Washington, DC: PBGC.
- (2002). *Annual Report*. Washington, DC: PBGC.
- (2003). *Annual Report*. Washington, DC: PBGC.
- (2004). *Annual Report*. Washington, DC: PBGC.
- (2005). *Annual Report*. Washington, DC: PBGC.



- (2006). *Annual Report*. Washington, DC: PBGC.
- (2007). *Annual Report*. Washington, DC: PBGC.
- (2008). *Annual Report*. Washington, DC: PBGC.
- (2009). *Annual Report*. Washington, DC: PBGC.
- (2010). *Annual Report*. Washington, DC: PBGC.
- (2011). *Interest Rate and Mortality Factors*. Washington, DC: PBGC (April).
- Towers Watson (2010a). “Retirement Attitudes Survey, Part II, Attitudes Toward Risk”, Towers Watson Report. Washington, DC: Towers Watson.
- (2010b). “Towers Watson-Forbes Insights 2010 Pension Risk Survey: U.S. Executive Views”, Towers Watson Report. Washington, DC: Towers Watson.
- Warshawsky, M. J. (2007). “The New Pension Law and Defined Benefit Plans: A Surprisingly Good Match”, *Journal of Pension Benefits*, 14(3): 14–27 (Spring).
- (2009). “Funding Relief for Single-Employer Defined Benefit Pension Plans.” Testimony before the Ways and Means Committee (October 1).
- (2010). “A Proposal for Retirement Plan Reform”, *Tax Notes*, 128(10): 1041–58 (September 6).
- Watson Wyatt Worldwide (2008). *Retirement Plan Design: Past, Present and Future*. Washington, DC: Watson Wyatt.