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# THE FINANCIAL CRISIS AND PRIVATE DEFINED BENEFIT PLANS

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## Introduction

Between October 9, 2007 and October 9, 2008, the value of equities in retirement plans dropped by about $4 trillion, with the decline divided equally between defined benefit and 401(k)/Individual Retirement Accounts (IRAs). The decline in the defined benefit arena was in turn divided equally between private sector plans and those sponsored by state and local governments. This *brief* explores what a loss of roughly $1 trillion of private sector defined benefit equities means for the individual participants and for the firms that sponsor those plans.

The *brief* is structured as follows. The first section shows that defined benefit plans still play an important role in the private sector. The second section describes how defined benefit plans insulate participants from market fluctuations by absorbing the risk themselves. The third section explores how the absorption of that risk affects private plan sponsors in terms of increased contributions and raises the possibility of some stressed employers laying off workers or going bankrupt with inadequate pension assets, or healthy companies deciding to freeze their plans. The fourth section discusses how individual participants are protected in the case of layoffs, bankruptcies, and freezes but in all cases end up with less retirement income than anticipated. The fifth section concludes on two points. First, in terms of risk bearing, neither extreme may be workable – all risks borne by sponsors as in the case of defined benefit plans or all risks borne by individuals as in the case of 401(k) plans; some other approach to pension design merits serious consideration. Second, funding requirements that compel companies to increase their contributions dramatically during a recession increase the likelihood of layoffs and terminations.

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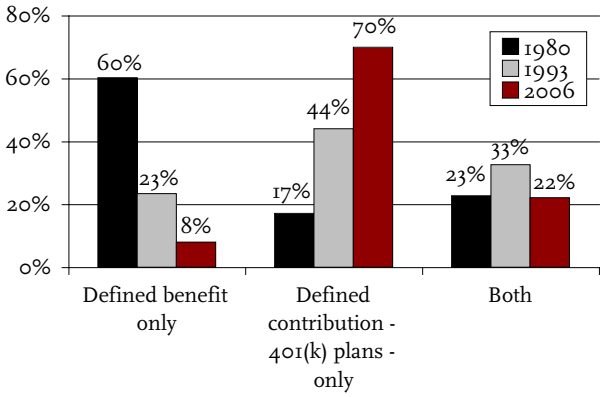
# The Current Role of Defined Benefit Plans

Since the early 1980s, pension coverage in the private sector has shifted decidedly from defined benefit to defined contribution plans (see Figure 1). But defined benefit plans remain important. They cover 20 million active participants and pay benefits to millions of retirees.

Figure 1. Private Sector Workers with Pension Coverage, by Pension Type, 1980-2006




*Note:* Although these calculations adjust for double-counting, some overestimation of coverage may still remain. The 2006 numbers are based on partial year filings.
*Sources:* U.S. Department of Labor (2004); and authors' calculations from U.S. Department of Labor, *Annual Return/Report Form 5500 Series*, 1993 and 2006.

Another indication of the continuing importance of private sector defined benefit plans is their role in financial markets. As of the end of 2007, these plans accounted for 18 percent of total retirement assets (see Table 1).[1]

Private sector defined benefit plans, like all forms of retirement saving, have seen large declines in the value of their equities during this financial crisis. Between October 9, 2007 – the market peak – and October 9, 2008, equities declined by 42 percent and private sector defined benefit plans, which held roughly 74 percent of their assets in equities at the end of 2007, saw a decline in the value of equities held of $0.9 trillion (see Table 2). The question is how this decline affects individuals and plan sponsors.

Table 1. Retirement Plan Assets, 2007

| Pension sponsor | Assets | Percent of total |
|---|---|---|
| Defined benefit plans | | |
| Private employer | $2.7 | 17.7% |
| State and local governments | 3.2 | 20.9 |
| Defined contribution plans | | |
| Private employer | 3.5 | 22.9 |
| IRAs | 4.7 | 30.7 |
| Federal government* | 1.2 | 7.8 |
| Total | 15.3 | 100.0 |

*These assets include all federal pension plans. Most of these assets are held in defined benefit plans for civilian and military workers. But the government's defined contribution Thrift Savings Plan is also included.
*Source:* U.S. Board of Governors of the Federal Reserve System (2008).

Table 2. Equity Declines from October 9, 2007 (Peak) to October 9, 2008, Trillions of Dollars

| Pension sponsor | Decline[a] |
|---|---|
| Defined benefit plans | |
| Private employer | $0.9 |
| State and local governments | 1.0 |
| Defined contribution plans | |
| Private employer | 1.1 |
| IRAs | 0.8 |
| Federal government[b] | 0.1 |
| Total | 3.8 |

[a] Figures may not add to total due to rounding.
[b] The Thrift Savings Plan accounts for slightly less than 20 percent of total federal pension assets, but it includes virtually all of the equity exposure.
*Source*: Munnell and Muldoon (2008).

# Impact of Decline in Defined Benefit Assets on Participants

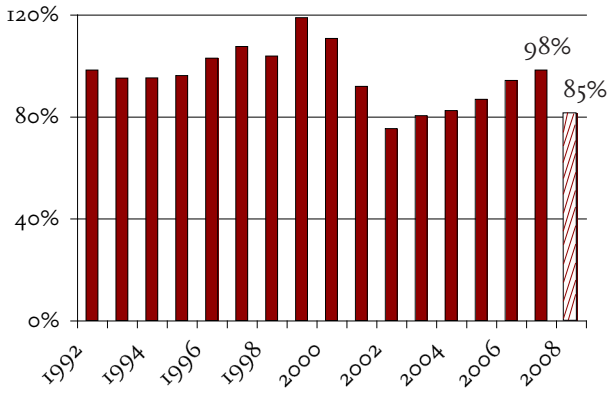
The financial crisis has crystallized the difference between defined benefit plans and 401(k)s. In 401(k)s, individuals bear the risk. If the stock market collapses, they take an immediate hit to their retirement assets. And those about to retire – who

on average held about two thirds of their assets in equities – will be forced to retire on less.[2] In defined benefit plans, however, participants are promised benefits based on years of service and earnings (typically the last five years), and these benefits must be paid regardless of what happens to the assets in the employer's pension plan. In short, participants in defined benefit plans are sheltered from the effect of the financial crisis on retirement assets.

# The Impact of the Financial Crisis on Plan Sponsors

As noted above, the financial crisis has reduced the value of equities in private sector defined benefit plans by about $0.9 trillion. A reasonable question is whether this decline will inhibit the ability of sponsors to pay benefits. The good news is that firms entered the crisis in relatively solid financial shape. A common measure of funding status, the ratio of assets to projected benefit obligations, shows a ratio of 98 percent for the 1,800 firms with defined benefit pensions in the Compustat database. Our estimate is that the financial crisis reduced this ratio to 85 percent by October 9, 2008 (see Figure 2).[3] This decline in funding levels is serious, but plans have more than enough money to meet their immediate benefit commitments.

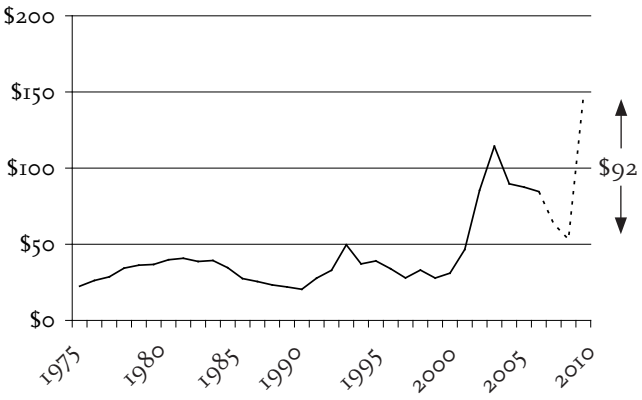
Figure 2. Funding Status of Private Sector Defined Benefit Plans, 1992-October 9, 2008




*Note:* The 2008 calculation assumes that plan sponsors increased their discount rate by 102 basis points between 2007 and 2008 (Citigroup 2008).
*Sources:* Authors' calculations from Standard and Poor's (1992-2008); Citigroup (2008); Wilshire Associates (2008); and U.S. Board of Governors of the Federal Reserve System (2008).

If equities remain at depressed levels, plan sponsors will have to increase their contributions over the next year. Under the Pension Protection Act of 2006, plans are required to eliminate any unfunded liability – that is, shortfall between promised benefits and assets – over a seven-year period. The measure used to determine the extent of underfunding is the accrued liability as reported on the Department of Labor's Form 5500. This measure – unlike the funding numbers in Figure 2 – does not include the impact of projected salary increases, but is based on current salaries and specified mortality tables and interest rates.[4] Based on this accrued liability measure, our estimate is that firms are going to have to increase contributions by about $90 billion in 2009 (see Figure 3).[5] If companies were granted extensions, the amortization period could be extended to ten years, and the required annual contributions would be somewhat smaller.

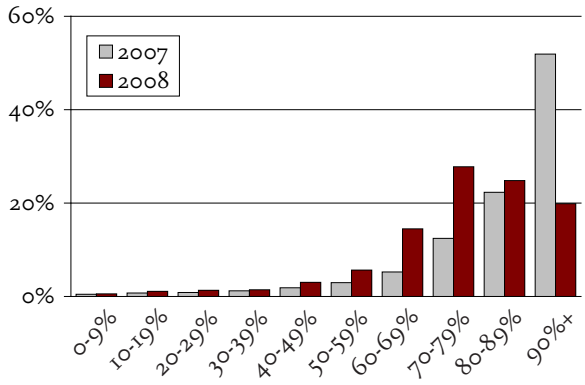
Figure 3. Defined Benefit Plans, Actual Contributions, Billions, 1975-2006 and Projections for 2007-2009




*Sources:* Authors' calculations from U.S. Department of Labor (2008); U.S. Department of Labor, *Form 5500 Series*, 2006; U.S. Board of Governors of the Federal Reserve System (2008); Wilshire Associates (2008); and Internal Revenue Service (2008a and 2008b).

Of course, aggregate data hide information about individual pension plans. Not all plans were almost 100 percent funded in 2007. Figure 4, which shows the distribution of plans by funding status, suggests that a number of plans had very low funding ratios. The incidences of underfunding raise the possibility that some companies may not be able to meet their obligations without placing enormous pressure on the firm. This challenge raises the question of firms laying off workers, freezing their pensions, or going bankrupt.

Figure 4. Distribution of Funding Ratios, 2007-2008




*Note:* 2008 figures are estimates for October 2008.
*Source:* Authors' calculations from Standard and Poor's (1992-2008); Citigroup (2008); Wilshire Associates (2008); and U.S. Board of Governors of the Federal Reserve System (2008).

# What Happens to Participants if Things Go Wrong?

The financial crisis could force some companies to lay off workers, push some plan sponsors into bankruptcy or persuade some healthy companies that no longer want to bear this type of financial risk to freeze their plans. In all cases, participants are entitled to the benefits that they have already earned under the plan, but the nature of a final earnings plan means that individuals will end up with less retirement income than they would have had otherwise.

## *Job Loss*

If an individual covered by a final earnings plan loses his job, he will end up with less at retirement than he would have had if he continued with the company. An example might help. Assume a plan provided 1.5 percent of final salary for each year of service and an employee had been at the company for ten years. If he were laid off, he would be entitled to 15 percent of salary at retirement. But that 15 percent would be applied to his salary at the time of the layoff rather than at retirement. So a 50-year-old employee earning $48,000 would be entitled to $7,200 (15 percent of $48,000) a year at age 65.[6] If he had continued in his job, his current tenure would have entitled him to 15 percent of his $60,000 salary at age 65 and he would have received $9,000 (15 percent of $60,000) for life instead of $7,200. Thus, individuals who are laid off end up with less than they would have had otherwise.

## *Bankruptcy*

If a firm goes bankrupt with inadequate pension assets to cover its pension commitments, participants' benefits earned to date are protected by the Pension Benefit Guaranty Corporation. This self-financing agency guarantees the payment of benefits up to certain limits in the event of plan termination. The limits for single employer plans in 2008 are $4,312.50 a month or $51,750 per year for a participant claiming at age 65. The limits are higher if the participant claims later and lower if he claims earlier. Some beneficiaries with high salaries and large pensions, such as the airline pilots, will not be fully protected by the PBGC, but for the vast majority of participants, the PBGC serves as a backstop.

## *Freezes*

While vulnerable companies might go bankrupt, healthy companies could decide that, in the face of higher required contributions, they no longer want to provide a defined benefit plan. One avenue to get out of the defined benefit business is to freeze the plan. At the time of the freeze, the participant is entitled to accrued benefits based on current salary, as described above in the context of layoffs. Since the freeze reduces future retirement benefits, companies generally introduce a new 401(k) plan or enhance their existing plan.

For older workers, however, losses derived from a pension freeze are difficult to compensate. Table 3 on the next page shows the replacement rate – defined as pension benefits as a percent of earnings at age 62 – under a typical defined benefit plan that is frozen and replaced by a roughly equivalent 401(k) plan (as measured by replacement rates at age 62 for a career employee).[7] An employee who joins the company's defined benefit plan at 35 would be entitled to a benefit equal to 43 percent of final earnings at age 62. If the sponsor freezes the plan when the employee is 50 and offers a 401(k), the replacement rate after the freeze is 28 percent. Thus, employees have a lot to lose from a freeze.[8]

Table 3. Replacement Rates for Worker Who Entered at 35, by Age at which Defined Benefit Plan Is Frozen and Replaced with a 401(k)

| Plan | Age at which 401(k) replaces frozen defined benefit plan | | | | | |
|---|---|---|---|---|---|---|
| | 35 | 40 | 45 | 50 | 55 | 62 |
| Defined benefit | 0% | 3% | 7% | 13% | 20% | 43% |
| 401(k) | 44 | 33 | 23 | 15 | 8 | 0 |
| Total | 44 | 36 | 30 | 28 | 28 | 43 |

*Source:* Munnell and Soto (2007).

# Conclusion

The main point of this *brief* is that the movement away from defined benefit plans has shifted the investment risk from the plan sponsor to the individual participant. The implications of this shift are dramatic during a financial crisis. While 401(k) participants take an immediate hit to their retirement assets, employees covered by defined benefit plans are relatively unaffected. They might not escape totally unscathed, however. The crisis could force companies to lay off defined benefit participants, cause some fragile firms to go bankrupt with inadequate pension assets, or induce healthy companies to freeze their plans. In such instances, even though the Pension Benefit Guaranty Corporation serves as a backstop, employees would end up with less retirement income than they had anticipated, because benefits would be based on earnings at the time of the layoff, bankruptcy, or freeze rather than at retirement. But these risks must be compared to decimated 401(k) balances, which for those approaching retirement may not have time to recover.

Two conclusions emerge from this brief overview. First, placing all the financial risk for the second tier of retirement income on either individuals or on firms does not work. The private sector is unlikely to revert back to final earnings defined benefit plans, where employers bear all the risk. But relying on a system where the individual bears all the risk does not make much sense either. It may be time for the United States to consider other ways of designing a retirement income system. Second, requiring firms to increase their funding dramatically just as the economy slips into recession also does not make sense. If defined benefit plans are to survive, their sponsors need to be able to accumulate excess reserves in good times to serve as a buffer when trouble emerges.

# Endnotes

1 Table 1 includes the holdings of IRAs because, even though they are not employer-sponsored, most of the money is rollovers from 401(k)s. See Investment Company Institute (2008).

2 Fidelity Investments (2007) and Vanguard (2008). Equity holdings as a percent of assets may be somewhat lower in Individual Retirement Accounts.

3 2008 private sector defined benefit funding status – the ratio of total assets to total liabilities – was calculated using Standard and Poor's (2007 and 2008); Citigroup (2008); Wilshire Associates (2008); and U.S. Board of Governors of the Federal Reserve System (2008). The calculations began with the most recent Compustat filings for private companies that operated a defined benefit plan and reported both assets and projected benefit obligations. Daily fluctuations in the Dow Jones Wilshire 5000 Index were applied from the reported filing date through October 9, 2008 (one year after the peak of the stock market) under the assumption that 74 percent of plan assets were invested in equities. On the liability side, it was assumed that sponsors increased their discount rate by 102 basis points, which reflects the increase in the Citigroup Pension Liability Index Discount Rate between December 31, 2007 and September 30, 2008 (Citigroup 2008). Liabilities were adjusted using the rule of thumb that a 25 basis point increase in the discount rate leads to a 4 percentage point reduction in projected liabilities (Winkelvoss 1993). Both assets and liabilities were adjusted on a pro-rated basis depending upon when the company filed during the year.

4 The Internal Revenue Service (IRS) publishes the specified interest rates. The IRS's Corporate Bond Weighted Average Interest Rate rose from 5.90 in December 2007 to 6.14 in October 2008, an increase of 24 basis points (Internal Revenue Service 2008a). This increase is considerably smaller than the 102 basis point rise in the Citigroup Pension Liability Index Discount Rate (Citigroup 2008), because the IRS smoothes its Weighted Average Rate over a four-year time period. The IRS is currently transitioning to "segment rates" that vary with the timing of a plan's liabilities; these rates experienced increases similar to those of the Weighted Average Rate (Internal Revenue Service 2008b).

5 Funding depends on the ratio of assets to current liabilities as reported in the Form 5500. In 2006, this ratio was 96 percent. Based on a somewhat comparable measure from the Compustat database – the *accrued benefit obligation* – funding improved slightly in 2007. Applying the same improvement to the 5500 data suggests that, in the aggregate, the current liability funding ratio was 100 percent in 2007. To estimate the funding ratio for 2008, the first step was to calculate the decline in the value of equities between year-end 2007 and October 9, 2008, which turned out to be 38 percent. Since private sector firms held about 74 percent of their assets in equities, private defined benefit assets declined by 28 percent. At the same time, the interest rate used to calculate liabilities increased by about 25 basis points (Internal Revenue Service 2008a and 2008b). The rule of thumb is that a 25 basis point increase reduces liabilities by about 4 percentage points (Winkelvoss 1993). Thus, the new ratio of assets to accrued liabilities is 72/96 or 75 percent. Applying those factors to the $2.68 trillion of assets in private defined benefit plans reported in the Flow of Funds for 2007 implies that assets are $645 billion short of liabilities. Eliminating that shortfall over seven years will require a $92 billion annual contribution.

6 The limits for participants in multi-employer plans are lower – $35.75 per month times the years of credited service.

7 Even with enhanced 401(k) contribution rates, employees 50 and over lose from the freeze. See Munnell and Soto (2007).

8 The relationship is not monotonic in age, however, because those who are about to reach age 62 have spent virtually all their lives under the defined benefit plan and are little affected by the freeze.

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