Wilshire Consulting

2009 Wilshire Consulting Report on Corporate Pension Funding Levels

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Table of Contents

Summary of Findings 1

Financial Overview 2

- The Data 2
- Assets, Liabilities, and Funding Ratios 2
- The Concentration of Plan Assets and Liabilities 5
- Pension Plan Liabilities 7
- Pension Plan Assets 9
- The Impact of Pension Expense (Income) on Corporate Earnings 10

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Summary of Findings

- The financial health of corporate pension plans experienced a substantial setback in 2008. Defined benefit pension assets for S&P 500 Index companies declined by $310.2 billion, from $1294.3 billion to $984.1 billion, while liabilities increased $21.9 billion, from $1199.7 billion to $1221.6 billion. As a result, the aggregate funding ratio (assets divided by liabilities) for all plans combined decreased from 107.9% to 80.6% and a $94.6 billion surplus at the beginning of the year became a -$237.5 billion deficit. (Exhibit 1)

- Ninety-two percent of corporate pension plans are under-funded, which is notably higher than the 62% reported for the previous year. The median (50th percentile) corporate funded ratio is 73.3%, which represents a decline from 96.6% last year. (Exhibit 3)

- Pension assets decreased significantly in concert with the broad based deleveraging in global financial markets. The median 2008 investment return was -27.4%, following five years of rising median returns of 8.2% in 2007, 11.2% in 2006, 8.5% in 2005, 10.8% in 2004, and 17.1% in 2003.

- Although the interest rates used to discount future benefits rose modestly, helping to lower the present value of liabilities, the overall size of liabilities increased. The median discount rate rose from 6.19% to 6.25%, while total liabilities increased 1.8% for the year. (Exhibit 8 & Exhibit 9)

- The combined pension expense for S&P 500 Index companies was -$11.5 billion for 2008, down from +$20.2 billion a year ago. Regular annual pension expense accruals from employee service and interest expense on existing liabilities totaled $100.1 billion in 2008, 3.5% higher than the $96.7 billion a year ago. (Exhibit 11)

- S&P 500 Index companies contributed $30.0 billion into their defined benefit plans in 2008, which was more than the $25.2 billion contributed in 2007.

- Aggregate benefit payments from corporate pension plans increased slightly during the past year. Benefit payments totaled $81.9 billion in 2008, compared to $78.4 billion during the previous year.

- The distribution of pension liabilities and assets of S&P 500 Index companies is relatively concentrated among the largest plans. As of the end of fiscal year 2008, more than half of the total pension assets and liabilities were held by the 20 and 23 largest plans when ranked by asset and liability size, respectively. Conversely, the smallest 100 plans when ranked by asset and liability size made up just 2.0% and 2.3% of the total asset and liability pool, respectively. (Exhibit 6)

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Financial Overview

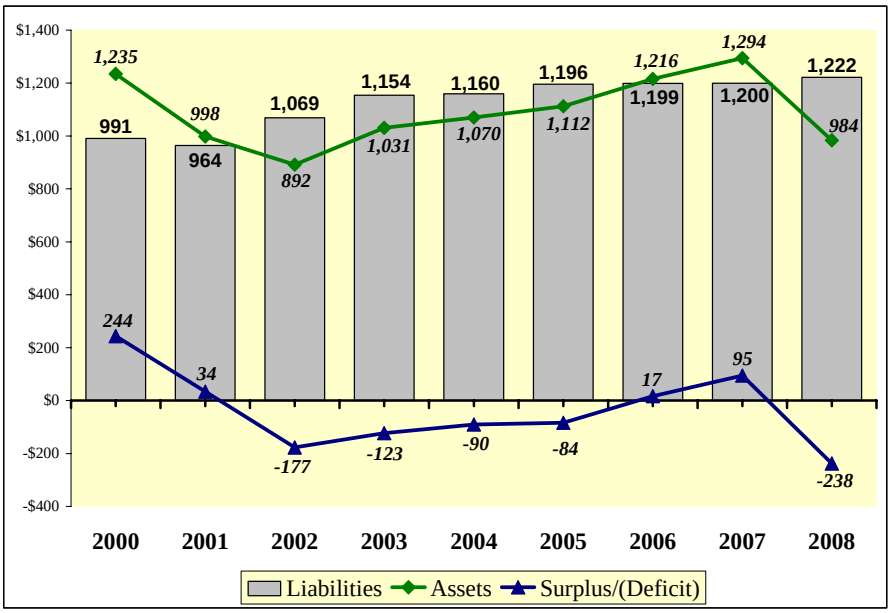
The Data

This is Wilshire Consulting's eighth study covering defined benefit plans sponsored by S&P 500 Index companies. Wilshire's practice is to collect data on U.S. pensions from 10-K filings for companies in the S&P 500 Index at fiscal year-end. All data for fiscal years 2008 and 2007 are based on S&P 500 Index constituents as of year-end 2008 and, therefore, may differ slightly from the list of companies represented in earlier years.

Assets, Liabilities, and Funding Ratios

The financial health, as measured by the aggregate funding ratio, of corporate pension plans declined notably in 2008, according to our latest survey of 323[1] companies in the S&P 500 Index that maintain defined benefit plans. Exhibit 1 shows the change in aggregated assets, liabilities, and surplus (assets minus liabilities) for the surveyed companies from 2000 to the most recent 2008 fiscal reporting year.

Exhibit 1
Corporate Pension Assets & Liabilities (in $billions)



Pension Deficit, the difference between the market value of assets and liabilities, increased by $332.1 billion from a surplus of $94.6 billion at the end of 2007 to a deficit of -$237.5 billion at the end of 2008. At the same time, the aggregate funding ratio, equal to assets divided by liabilities, decreased from 108% to 81%.

[1] *Sears Holding Corporation (SHLD) was included in Wilshire's 2008 report but did not file their Form 10-K before this report's data collection deadline. The FY 2007 results for SHLD were included in the aggregate 2008 data. Pioneer Natural Resource and BJ Services were excluded from this year's survey for incomplete pension filings.*

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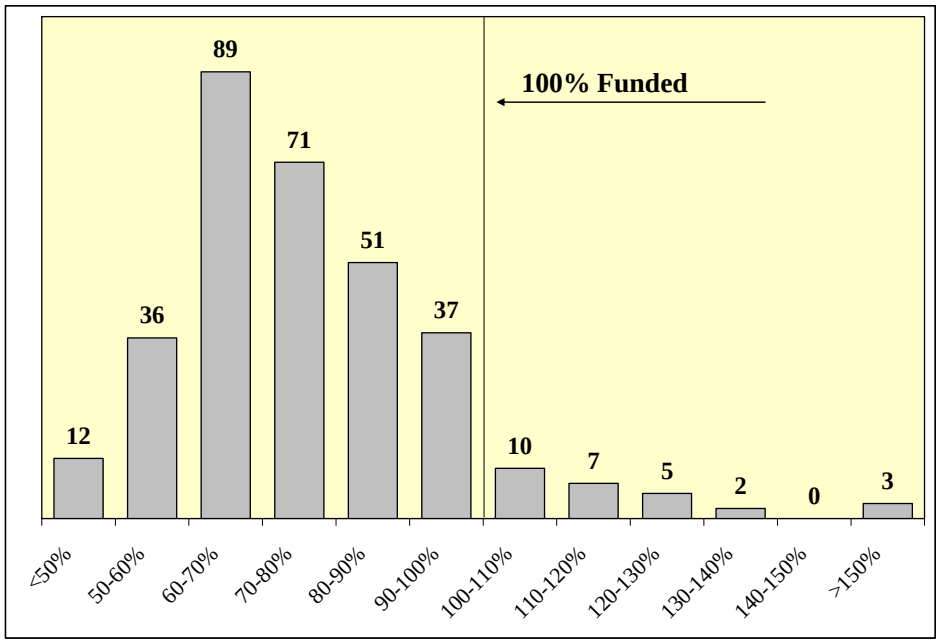
The aggregate figures in Exhibit 1 mask considerable differences among individual corporate plans. Exhibit 2 shows a histogram of funding ratios for the 323 corporate pension plans in our study.

Exhibit 2
Distribution of 323 Corporate DB Pension Plans by Funding Ratio



Only 27 of the 323 corporations, or 8.4%, have pension assets that equal or exceed liabilities. This is notably lower compared to last year's 38.4% and surpasses the 11% lows observed in 2002. Conversely, the percentage of corporations with assets below liabilities was 89% in 2002 versus a still higher 91.6% in 2008.

Exhibit 3 displays graphically how the distribution of corporate pension funding ratios has changed during the past eight years. Four lines are charted, three corresponding to a percentile rank and one corresponding to the aggregate funding ratio. The 50th percentile or median, corporate funding ratio declined rapidly from 112% at the end of 2000 to 78% at the end of 2002, but climbed steadily to end 2007 at 97%. Fiscal year 2008 experienced a sharp reversal in fortunes however with the funding ratio ending the year at 73%. The change in aggregate funding ratio experienced a pattern similar to the median funding ratio during the same period.

In 2000, the 125% aggregate funding ratio translated into a $244 billion surplus. The bear market coupled with falling interest rates over the following two years worsened the financial condition of corporate pension plans by $421 billion ($244 billion surplus in 2000 to -$177 billion deficit in 2002). The improving stock market during the subsequent five years improved the financial condition of corporate pension plans by $272 billion (-$177 billion deficit in 2002 to a $95 billion surplus in 2007), despite a declining interest rate environment for most of that period. In 2008, the $95 billion surplus of 2007 was completely wiped out and replaced by a year-end deficit of -$238 billion, contributing to the steep drop-off in funding ratio for the year.

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Exhibit 3
Corporate Funding Ratios

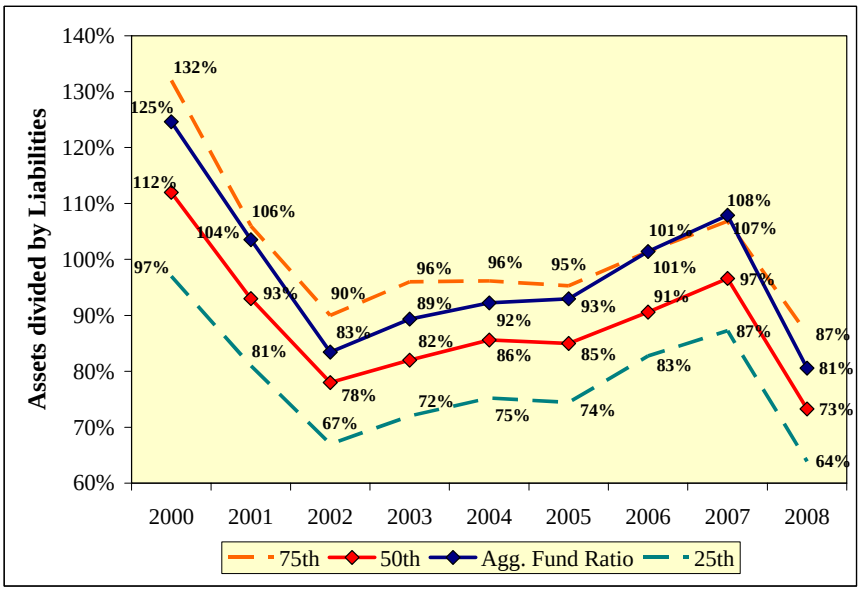
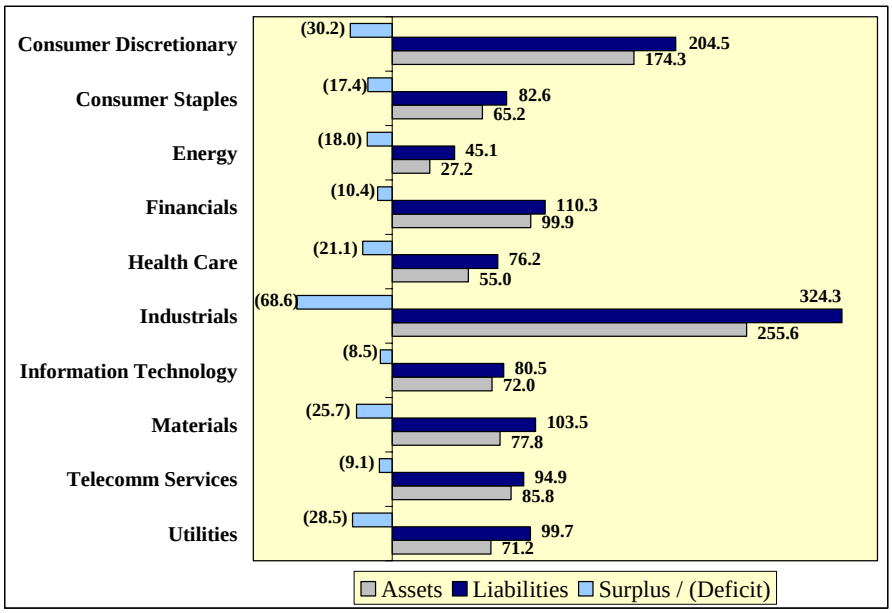


Exhibit 4 shows the combined assets, liabilities, and surplus for the surveyed companies, broken down into Global Industry Classification Standards (GICS) sectors for the 2008 fiscal reporting year.

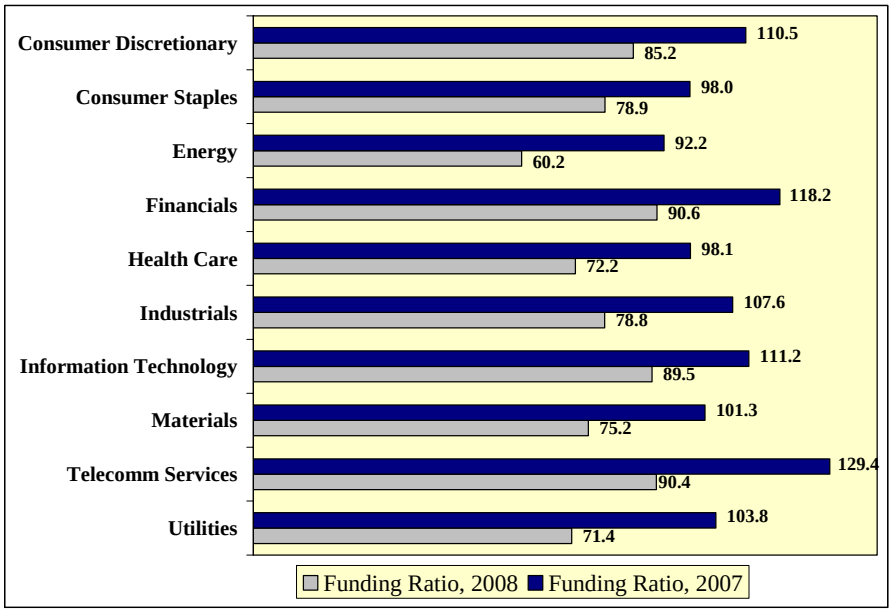
Exhibit 4
Corporate Pension Assets & Liabilities (in $billions) by GICS Sector



In 2007, the number of sectors with a surplus stood at a relatively high 70% but in 2008 all sectors' defined benefit plans ended the year with a deficit. Industrials, which comprise a hefty 26.0% of total assets and 26.5% of total liabilities among the S&P 500 Index companies studied, contributed 28.9% (-$68.6 billion) to the total -$237.5 billion deficit, with utilities and consumer discretionary sectors representing 12.0% (-$28.5 billion) and 12.7% (-$30.2 billion) of the total deficit respectively. Significant to the distribution of pension assets and liabilities in particular sectors, General Motors deficit of $13.6 billion for 2008, represented 45.1% of the consumer discretionary deficit and 5.7% of the total deficit for all companies studied.

Exhibit 5 summarizes the funding ratios for the surveyed companies in 2008 and 2007, broken down by their GICS sectors.

Exhibit 5
Corporate Pension Funding Ratios by GICS Sector



The financials sector had the highest funding ratio, at 90.6%, while the energy sector had the lowest funding ratio at 60.2%. However, the energy sector accounted for the smallest proportion of assets and liabilities in the surveyed companies, approximately 2.8% and 3.7%, respectively. Coming in second place, telecomm services posted a funding ratio of 90.4% followed up by the information technology sector's 89.5% funding ratio. Overall however, all ten sectors experienced declining funding ratios for the year ending 2008.

The Concentration of Plan Assets and Liabilities

While the aggregated pool of S&P 500 Index defined benefit plans is only 80.6% funded this year, the concentration of assets and liabilities within this set of plans indicates that a relatively small sub-set of plans has an overwhelming impact on the entire pool of plans. Exhibit 6

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outlines the concentration of plan assets and liabilities when ranked by size and provides funding ratio data for the subset of plans examined.

Exhibit 6
Concentration of 323 Corporate DB Pension Plans by Assets and Liabilities

	Assets	Liabilities	Median Funded Ratio	Funded Ratio Range		
25 Largest Plans	53.7%	51.5%	78.6%	50.0%	to	104.6%
100 Smallest Plans	2.0%	2.3%	72.2%	5.8%	to	159.6%

The largest 25 plans when ranked by assets and liabilities represent 53.7% and 51.5% of assets and liabilities, respectively, of the total 323 plans. The median funded ratios stand at 78.6% and 72.2% for the 25 largest and 100 smallest plans, respectively.

Exhibit 7 plots all of the 323 plans sampled in this study based on their funded ratio and plan liability size. While a simple trend line appears to suggest there is some relationship between liability size and funding ratio, the relationship is less pronounced when the few largest outliers are removed from this scatter plot.

Exhibit 7
Liability Size and Funding Ratio

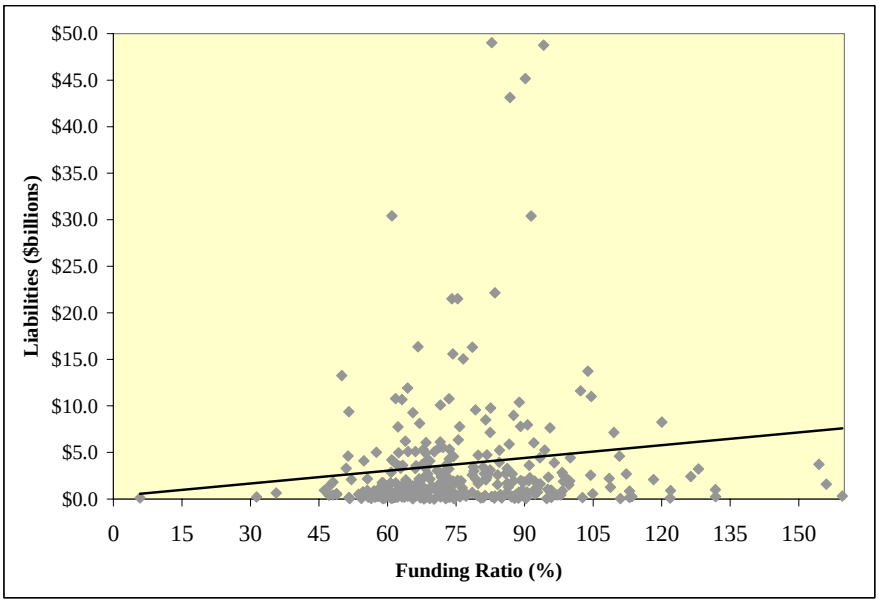

Exhibit 8 provides a combined accounting of the S&P 500 Index corporate pension plans for the 2008 fiscal year.

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Exhibit 8
Change in Assets & Liabilities for 2008

		In Billions	% of BOY
Liabilities - Beginning of Year (BOY)	$	1,199.7	
Service costs		27.0	2.2%
Interest costs		73.1	6.1%
Benefit payments		(81.9)	-6.8%
Actuarial losses (gains)		(2.8)	-0.2%
Other		6.5	0.5%
Liabilities - End of Year (EOY)	$	1,221.6	1.8%
Assets - Beginning of Year (BOY)	$	1,294.3	
Contributions		30.0	2.3%
Actual return on assets		(251.9)	-19.5%
Benefit payments		(81.9)	-6.3%
Other		(6.4)	-0.5%
Assets - End of Year (EOY)	$	984.1	-24.0%

Note: -19.5 % actual return on assets is based on beginning of year asset value.

Pension Plan Liabilities

There are three recurring items that annually affect the growth in liabilities. The first item is service cost. This cost arises from employees earning additional benefits from another year of service. Service cost, which changes little from year to year, added $27.0 billion or 2.2% to aggregate pension liabilities in 2008. The second item is interest cost. Liabilities are determined by discounting expected future benefit payments. As each year passes, liabilities increase by the annualized interest cost because there is one less year to discount future benefits. This cost item should also remain predictable from year to year. Thirdly, liabilities are reduced by benefits paid during the year since they represent a payment against the company's pension liability.

If these recurring items were the only changes, then corporate pension liabilities would have grown by just $18.2 billion, or 1.5%. Instead, liabilities increased by $21.9 billion, or 1.8%, in 2008. A potentially large portion of the difference lies primarily within the "other" category. The "other" category refers to changes in liabilities, either negative or positive, that arises from the addition or subtraction of liabilities from unrecognized prior service cost, curtailments, or corporate acquisition activity. Large dollar figures in the "other" category are however, often the result of companies acquiring other pension plans, as part of a corporate merger or acquisition. When that happens, there also is a corresponding entry into the "other" category under assets. The primary contributors to this net amount during 2008 however, were more evenly distributed among the different sub-categories of "other."

- General Motors: $10.0 billion (amendments, Delphi plan transfer, and curtailments)
- Hewlett Packard: $5.0 billion (EDS acquisition)

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- Wells Fargo: $4.4 billion (Wachovia acquisition)

The final item that affects liabilities in Exhibit 8 is "Actuarial losses (gains)" which refers to changes in liabilities, either negative or positive, that arise when actual actuarial losses (gains) occur due in part to changes in discount rates – in general, when discount rates rise, the present value of liabilities fall. From 2001 to 2005 companies reported large actuarial losses partially as a result of falling discount rates. In 2006 however, the median discount rate increased from 2005 marking a turn in direction from the previous five year trend. The year 2008 continues this rise in median discount rate, which ended the year at 6.25%. Exhibit 9 illustrates the drop in discount rates that started in the year 2001 and continued through 2005. A slight reversal occurs in 2006 and continues through to 2008.

Exhibit 9
FAS 87Discount Rate by Percentile

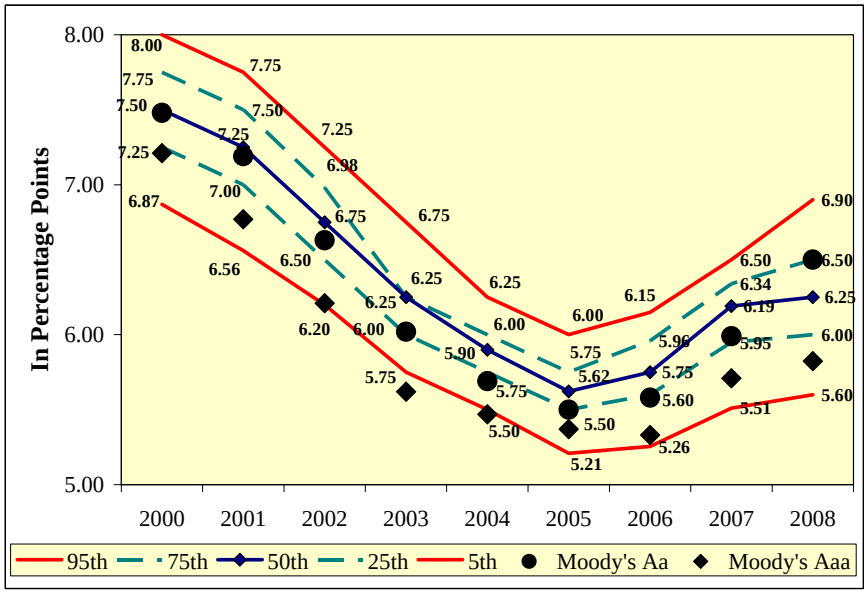

Exhibit 9 shows the distribution of discount rates used by S&P 500 Index companies from 2000 to 2008. The median, or 50th percentile, discount rate has recently risen from 5.62% in 2005 to 6.25% in 2008.

Each year companies select an FAS 87 discount rate that approximates a settlement rate for their pension liabilities, taking into consideration the current rates of return on high-quality fixed income investments. The Moody's Aa and Aaa corporate bond yields are generally thought to be fair estimates for pension liability settlement rates. The Moody's Aa corporate bond yield had fallen from 7.48% at end-of-year 2000 to 5.50% at end-of-year 2005. As interest rates fell, companies were forced to lower their discount rates, thereby increasing total pension liabilities. However since year end 2005, both Aa and Aaa corporate bond yields have trended up, ending the year 2008 at 6.50% and 5.82% respectively. Incidentally, the spread between Aa and Aaa rates is the largest year end spread for the past nine years, at 68 basis

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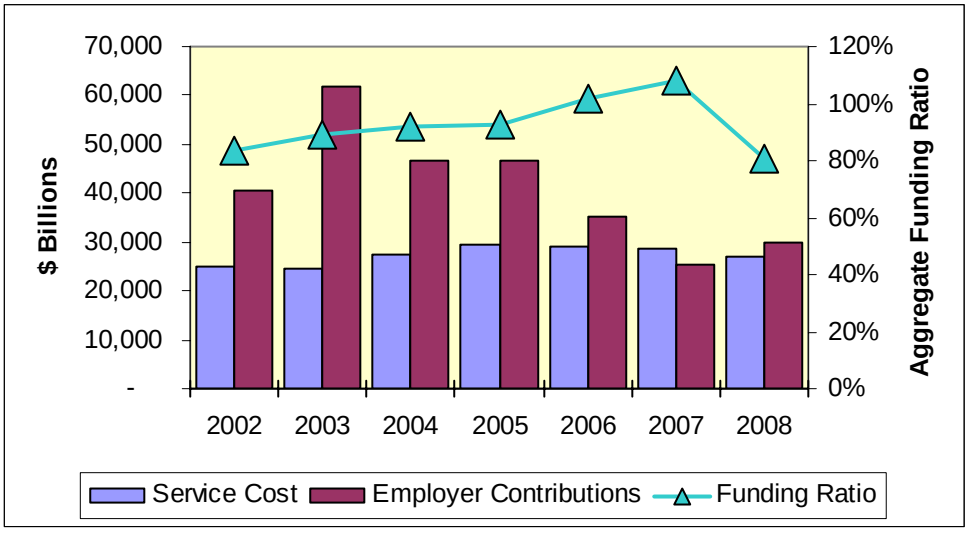
points. Exhibit 9 includes these corporate bond yields with the historical distribution of discount rates.

Pension Plan Assets

There are three recurring items that annually cause changes in plan assets. The first is corporate contributions to the pension plan, which totaled $30.0 billion or 2.3% of assets during 2008. In an ideal world where the contribution and financial reporting actuarial methods and assumptions are identical and all assumptions are perfectly accurate, contributions would be at a level equal to service costs, as companies pay for new benefits earned during the year. This would occur when assets equal liabilities and when assets earn a return equal to the discount rate used to value liabilities. If assets are below liabilities, or asset returns fall below the discount rate, then corporate contributions typically rise to make up for the short fall and vice versa. This reactive behavior is prone to overshoot error wherein corporate contributions may substantially exceed or fall short of service costs depending on the experience of the previous year(s). Below in Exhibit 10, service cost and employer contribution are charted against funding ratio from 2002 to present. Reflecting the bias of decision making based on past experience, it is clear that company contributions slowed as market returns boosted funding levels. Given the recent decline in the aggregate funding ratio for 2008, it is expected that many companies will contribute in excess of service cost in the coming year.

Exhibit 10
Employer Contributions and Funding Ratio



In 2008, the $30.0 billion in company contributions exceeded the $27.0 billion in aggregate service costs. The chart reflects a general pattern of over contributing relative to the level of service costs in years where funding ratios are below 100%, indicative of an effort to reach 100% funding, and under contributing relative to the level of service costs when funding ratios exceed 100%. For example, Bank of America Corp. which ended the year 2007 with a funding ratio of 132% did not make pension contributions for the year despite service costs growing by

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$316 million. In 2008 however, Bank of America made a $1.4 billion contribution to their plan while service costs amounted to only $343 million. Similarly, Travelers Companies which ended the year with a funding ratio of 92.2% contributed a hefty $450 million in 2008 while in 2007 it made no contribution despite service costs of $326 and $343 million respectively for each year.

The second item is the actual return on plan assets, which posted a -$251.9 billion loss for 2008. The aggregate actual annual returns as a percentage of beginning of year assets for the eight years from 2008 to 2001 have been; -19.5%, 10.3%, 13.0%, 8.5%, 11.7%, 17.3%, –8.9%, and -7.8% respectively. During the past year, a 1.8% rise in liabilities versus a 24.0% fall in assets resulted in a decrease in aggregate funding ratio from 107.9% to 80.6%.

The third recurring item affecting plan assets is benefit payments, which totaled $81.9 billion in 2008 and reduced assets and liabilities by the same amount. The final item is "other" and largely represents unrecognized prior service cost, curtailments, or corporate acquisition activity adding the pension plans from companies that were acquired. As previously mentioned, the primary contributors to this net amount during 2008 were General Motors, Hewlett Packard, and Wells Fargo, whose collective charge to the "other" category was $19.4 billion.

The Impact of Pension Expense (Income) on Corporate Earnings

Much has been written about the impact of pension expense (income) on corporate earnings as a result of the Pension Protection Act[2] which created a more defined and stricter set of guidelines for public companies sponsoring DB plans. Exhibit 11 provides an aggregate accounting of pension expense (income) for the 323 S&P 500 Index companies in our study.

Exhibit 11
Calculation of 2008 Pension Expense (Income)

		In Billions
Service Costs	$	27.0
Interest Costs		73.1
Expected Return on Plan Assets		(95.4)
Losses (Gains)		6.8
Pension Expense (Income)	$	11.5

There are four items that comprise pension expense (income). The first two are service costs and interest costs, which were described in Exhibit 8. There is some controversy surrounding the third item, the "expected return on plan assets." Market value accounting might suggest that service costs and interest costs be offset by the actual return on assets, a -$251.9 billion loss, in calculating pension expense (income). If this were so, pension expense would equal $352.0 billion in 2008. Instead, pension expense was $11.5 billion in 2008 because asset returns are

[2] For more information on the Pension Protection Act please refer to Wilshire Consulting's "Pension Protection Act of 2006" research note.

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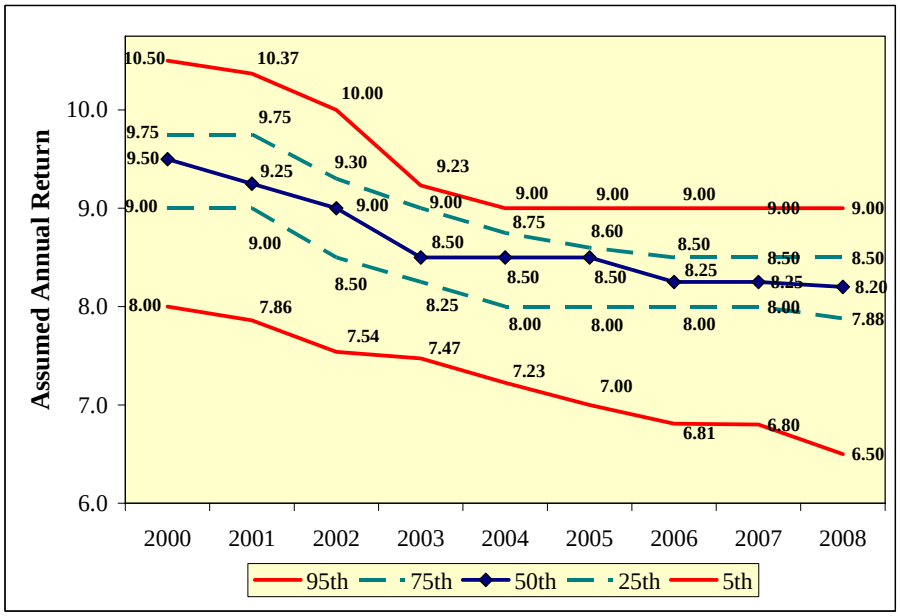
smoothed. In other words, to reduce the short-term volatility of asset returns on corporate net income, only a portion of the -$251.9 billion asset loss during 2008 will be recognized during the current year, similar to the amortization of the $124.5 billion asset gain during the previous year.

The expected rate of return for pension assets has been coming down in recent years (see Exhibit 12). The median expected return was 9.50% at the end of 2000 and has fallen to 8.20% at the end of 2008. The expected return assumption is multiplied by the level of assets to arrive at a dollar value of expected investment earnings that is credited against service and interest costs. In 2008, companies collectively expected their assets to earn $95.4 billion, and it was this number that was used in the calculation of pension expense and corporate net income. However, pension plans incurred actual losses of -$251.9 billion, which represents a -$347.3 billion net loss. Yet, differences between accounting earnings and market-based earnings cannot continue unabated. Once these differences exceed 10% of assets, they must be amortized over time and appear in the expense calculation as "Losses" or "Gains," the fourth item in Exhibit 11.

Exhibit 12
FAS 87 Long-Run Return on Assets by Percentile



Although the median expected return on plan assets assumption has fallen during the past eight years, from 9.50% in 2000 to 8.20% in 2008, many pension accounting critics believe that this assumption is still too high. Wilshire Consulting's long-term forecast for the return on corporate pension assets is approximately 7.32%, based on the average asset allocation of corporate pension plans[3]. However, individual pension plan expected returns will vary considerably depending upon their unique asset allocation. It should be noted that Wilshire

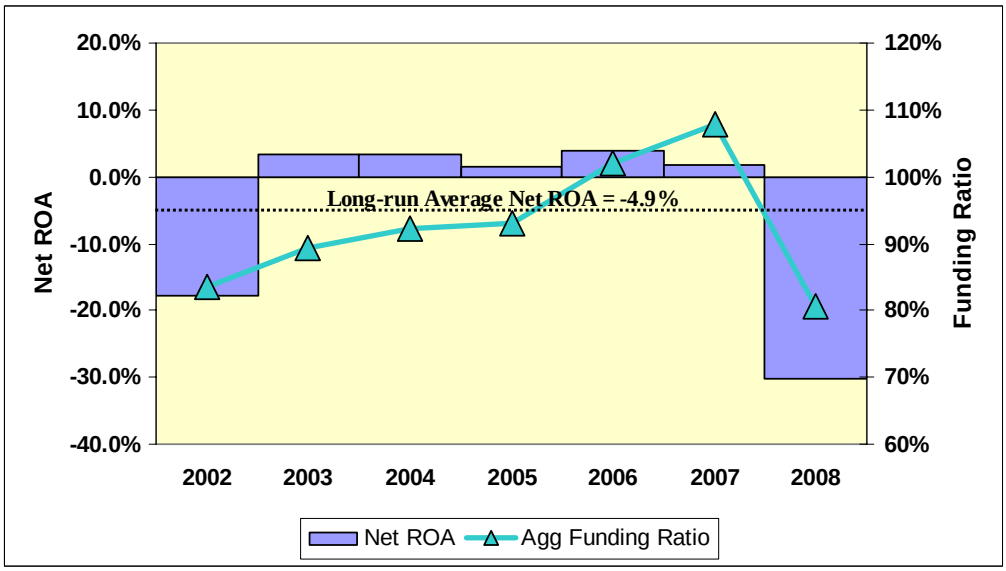
[3] Source: Greenwich Associates: US corporate defined benefit plans asset allocation as of 12/31/2008.

Consulting's asset class return forecast is for the next ten years while the horizon for the assumed return in corporate financial statements is an unspecified long term period. Additionally, Wilshire Consulting's assumed returns are for the asset classes with no consideration of potential value added from successful active management.

Finally, in Exhibit 13, the difference between the median expected return on assets and actual return on assets, or Net ROA is plotted against the aggregate funding ratio for each year from 2002 to 2008. From this perspective, funding ratios, which are measured on the right-hand axis, display a high sensitivity to net return on assets. Over a string of good years, funding ratios can grow at a nice steady pace; however, in years of large market disruption, funding ratios can give back gains of several years abruptly. Thus the pro-cyclical effect of returns driving funding ratios is linked back to corporate pension plan contributions rising and falling with the tide of funding ratios rather than with the more consistent increase in current service costs. In light of the funding targets set out by the Pension Protection Act, company contributions will have to increase substantially to achieve full funding by 2011.

If the deflating of the technology bubble at the turn of the century is viewed as an analogous event, positive market returns for several years forward will have to be experienced, five years in the case of the technology bubble, to grow out of the current funding deficit. Yet market growth assumptions did not do all the work in the past as displayed in Exhibit 10; companies today will at minimum face steeper contribution schedules to meet full funding requirements under the targets of the Pension Protection Act.

Exhibit 13
Net Return on Assets and Funding Ratios



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