2015 Wilshire Consulting Report on Corporate Pension Funding Levels

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***Julia K. Bonafede**, CFA, President*
***Steven J. Foresti**, Managing Director*
***Russell J. Walker**, Vice President*
Wilshire Associates Incorporated
1299 Ocean Avenue, Suite 700
Santa Monica, CA 90401
Phone: 310-451-3051
contactconsulting@wilshire.com

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Summary of Findings

- Despite relatively strong global equity market performance, lower liability discount rates and adoption of new actuarial mortality tables drove corporate pension funding ratios lower in fiscal 2014. Defined benefit pension assets for S&P 500 Index companies increased by $62.0 billion, or 4.6%, from $1,335.6 billion to $1,397.6 billion, while liabilities increased $204.7 billion, or 13.7%, from $1,489.0 billion to $1,693.7 billion. As a result, the aggregate funding ratio (assets divided by liabilities) for all plans combined decreased from 89.7% to 82.5% and the -$153.4 billion funding shortfall at the beginning of the year grew to a -$296.1 billion deficit. (Exhibit 1)
- Ninety percent of corporate pension plans were underfunded as of fiscal year-end 2014, compared to 80% underfunded plans as of fiscal year-end 2013. The median (50th percentile) corporate funding ratio for fiscal 2014 is 83.0%, a notable decline from the median funding ratio of 89.5% for the previous fiscal year. (Exhibit 3)
- The defined benefit plans in our study yielded a median 9.2% rate of return for fiscal 2014. This strong performance combines with the 11.1% median plan return for 2013, 11.8% median plan return for 2012, the 3.5% median plan return for 2011, the 11.9% median plan return for 2010 and the 16.0% median plan return for 2009 to mark six consecutive years of gains for these plans after the global market dislocation events of 2007 and 2008.
- Interest rates used to discount future benefits fell during 2014, contributing to the overall decrease in pension liabilities for the year. The median discount rate decreased from 4.80% to 4.05%, while total liabilities increased 13.7% for the year. (Exhibit 8 & Exhibit 9)
- The combined pension expense for the S&P 500 Index companies in our study was $43.5 billion for 2014, up from $35.0 billion a year ago. Regular annual pension expense accruals from employee service and interest expense on existing liabilities totaled $95.7 billion in 2014, 1.1% higher than the $94.7 billion a year ago. (Exhibit 13)
- The S&P 500 Index companies in our study contributed $36.6 billion into their defined benefit plans in 2014, a decrease from the $40.0 billion contributed in 2013.
- Aggregate benefit payments from the S&P 500 corporate pension plans in our study increased 3.1% year-over-year. These plans' benefit payments totaled $90.6 billion in 2014, compared to $87.9 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 2014, more than half of the total pension assets and liabilities were held by the 25 largest plans when ranked by both asset and liability size. Conversely, the smallest 100 plans when ranked by asset and liability size made up just 2.7% and 2.8% of the total asset and liability pools, respectively. (Exhibit 6)

Financial Overview

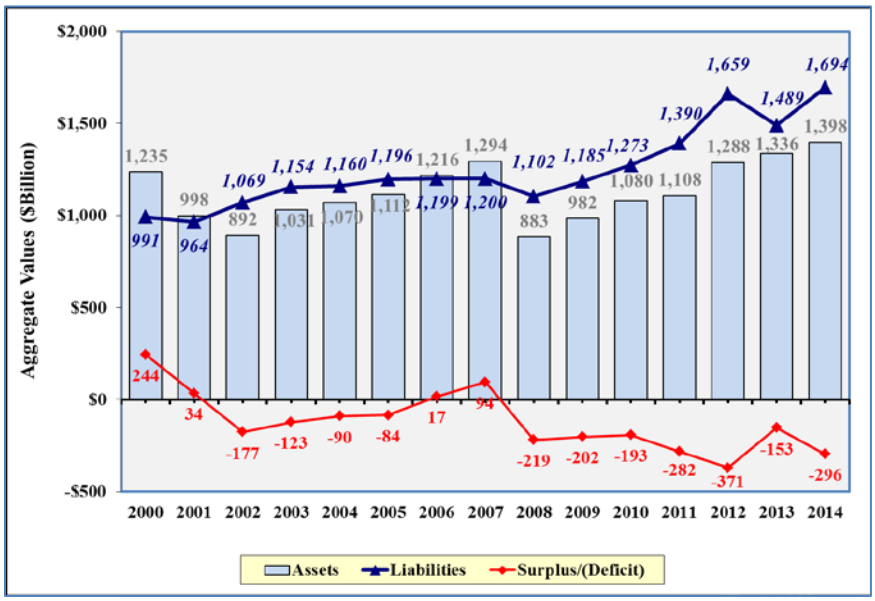
The Data

This is Wilshire Consulting's fifteenth 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 2014 and 2013 are based on S&P 500 Index constituents as of year-end 2014 and, therefore, may differ slightly from the list of companies represented in earlier years.

Assets, Liabilities, and Funding Ratios

The financial health of corporate pension plans, as indicated by the aggregate funding ratio of S&P 500 company pensions, worsened in fiscal 2014, according to our latest survey of 299 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 2014 fiscal reporting year.

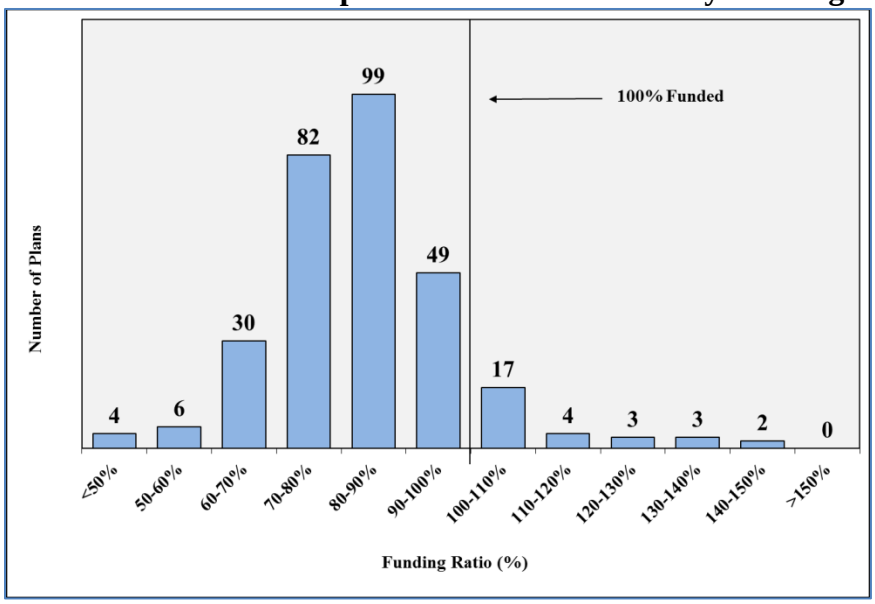
Exhibit 1
S&P 500 Defined Benefit Pension Assets and Liabilities



The aggregate pension deficit, represented by the difference between the market value of assets and liabilities, grew by $142.7 billion from a deficit of -$153.4 billion at the end of 2013 to a deficit of -$296.1 billion at the end of 2014. At the same time, the aggregate funding ratio, equal to assets divided by liabilities, decreased from 89.7% to 82.5%.

The aggregate figures in Exhibit 1 mask considerable differences among individual corporate plans. Exhibit 2 shows a histogram of funding ratios for the 299 corporate pension plans in our study.

Exhibit 2
2014 Distribution of 299 Corporate DB Pension Plans by Funding Ratio



Twenty-nine of the 299 corporations, or 9.7%, have pension assets that equal or exceed liabilities. In comparison, 59 of the 299 corporations' DB plans, or 19.7%, were fully-funded or running a surplus at year-end 2013. Note that at fiscal year-end 2007, five years into a recovery from the 2000-2002 bear market (and one year prior to the global recession of 2008 and early 2009), 42% of S&P 500 DB plans were at fully-funded or surplus status[1].

Exhibit 3 displays graphically how the distribution of corporate pension funding ratios has changed during the past fifteen 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%. However, fiscal year 2008 experienced a sharp reversal in fortunes, with the funding ratio ending the year at 73%. The global equity markets started to rally strongly from their severe reversals in March 2009; this rally continued through year-end 2010, but encountered strong headwinds in 2011. As a result, the median corporate funding ratio ended 2011 at 78%, recovering a fair amount of the ground lost in 2008 but sliding back from the 2010 median funding ratio of 82%. Despite strong equity markets in 2012, the median corporate funding ratio

[1] Bonafede, Julia K., Steven J. Foresti and Alexander Browning, **2008 Wilshire Report on Corporate Pension Funding Levels**, Wilshire Consulting Investment Research publication, April 1, 2008.

drifted down to 76% at year-end, as lower interest rates and discount rates served to increase plan liabilities. Surging equity markets combined with higher interest rates (and commensurately higher liability discount rates) to dramatically raise the median funding ratio for S&P 500 companies to 89% for fiscal 2013. Although global equity markets did enjoy relatively robust performance in fiscal 2014, this growth was countered by a drop in global interest rates, driving down liability interest rates. Additionally, in fiscal 2014 many corporate plan sponsors updated mortality tables to value their accounting liabilities; as these updated tables incorporate significant increases in life expectancy compared to prior tables, pension plans saw a notable increase in their accounting liability and a commensurate drop in their funding ratios[2].

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, in addition to contributions in excess of service costs, 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 $94 billion surplus of 2007 was completely wiped out and replaced by a year-end deficit of -$219 billion, contributing to the steep drop-off in funding ratio for the year. Pensions have improved their overall financial condition in the subsequent five years thanks to rallying capital markets and higher company contributions. After four years of sustained increases, liabilities decreased in fiscal 2013, allowing funding ratios to dramatically improve. However, as noted above, despite positive performance in global capital markets, lower liability discount rates and the adoption of the updated mortality tables pushed liabilities higher in fiscal 2014, driving funding ratios lower:

[2] Many corporate plan sponsors chose to adopt the RP-2014 mortality rates published by the Society of Actuaries (see McGuire, Ned, **Mortality Table Update**, Wilshire Consulting Investment Research publication, July 2, 2014). Several large plan sponsors adopted mortality tables derived from their plan-specific population experience.

Exhibit 3
Corporate Funding Ratios

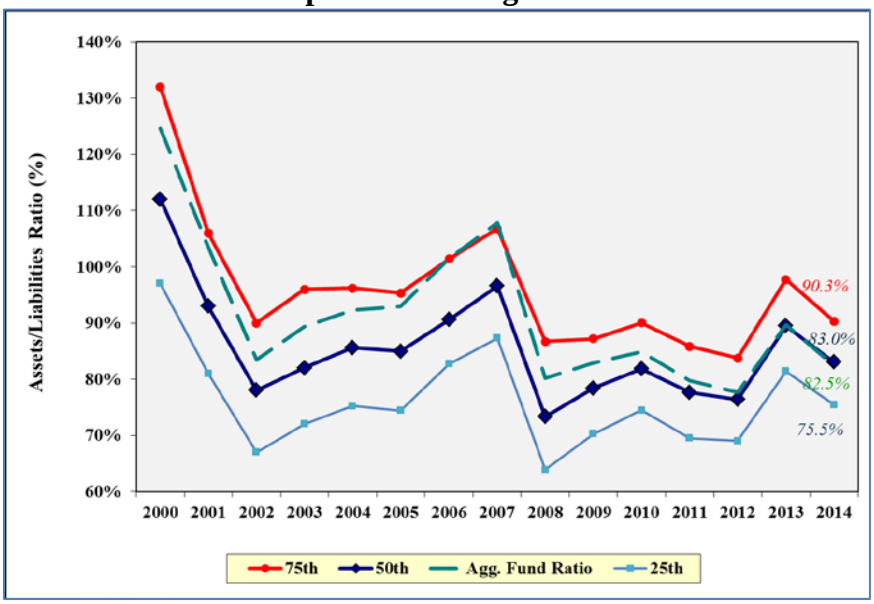
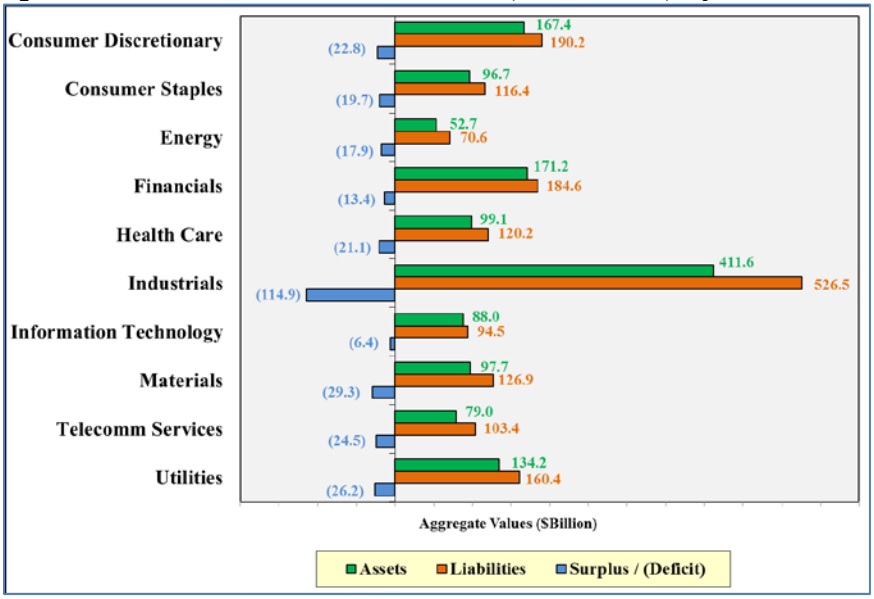


Exhibit 4 shows the combined assets, liabilities, and surpluses for the 299 surveyed companies, broken down into Global Industry Classification Standards (GICS) sectors for the 2014 fiscal reporting year.

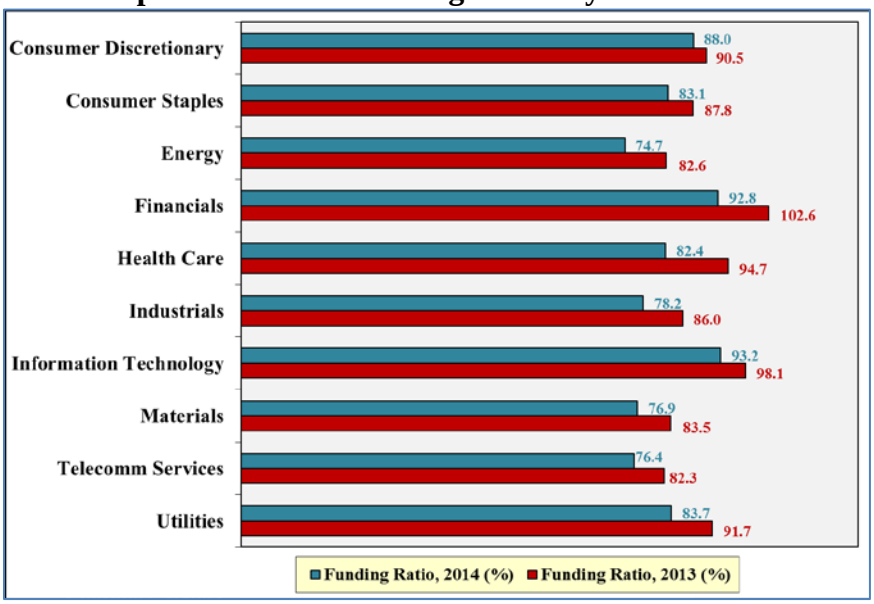
Exhibit 4
Corporate Pension Assets & Liabilities (in $billions) by GICS Sector



All sector sub-groups ran an aggregate pension deficit at year-end 2014. Industrials, which comprise a hefty 29.5% of total assets and 31.1% of total liabilities among the S&P 500 Index companies studied, contributed 38.8% (-$114.9 billion) to the total -$296.1 billion deficit, with the Materials and Utilities sectors representing 9.9% (-$29.3 billion) and 8.8% (-$26.2 billion) of the total deficit respectively. General Electric Company's -$22.5 billion plan deficit, the largest shortfall of the S&P 500 companies in this survey, represents 19.5% of the Industrials sector's aggregate deficit and 7.6% of the aggregate deficit of these 299 corporate plans as of year-end 2014. Five other companies showed pension deficits in excess of $10 billion as of fiscal year-end 2014: Boeing Company (-$17.3 billion), AT&T Inc. (-$14.4 billion), Delta Air Lines Inc. (-$12.5 billion), Lockheed Martin Corp. (-$11.2 billion) and General Motors Corp. (-$10.9 billion). The funding ratios of these companies range from GM's 85.8% to Delta's 42.8%. The pension shortfalls of Boeing, Delta and Lockheed Martin represent a combined 35.7% of the total shortfall in the Industrials sector, and 13.8% of the total shortfalls of the S&P 500 companies in this survey. For its part, AT&T contributes 58.8% of the Telecomm Services sector's pension shortfall and 4.9% of the survey companies' aggregate shortfall. GM represented 47.8% of the Consumer Discretionary sector's total shortfall, and 3.7% of the total shortfall of all companies in this survey.

Exhibit 5 summarizes the funding ratios for the surveyed companies in 2014 and 2013, broken down by their GICS sectors:

Exhibit 5
Corporate Pension Funding Ratios by GICS Sector



The Information Technology sector had the highest 2014 funding ratio at 93.2%, while the Energy sector had the lowest funding ratio at 74.7%. However, the Energy sector accounted for the smallest proportion of assets and liabilities in the surveyed companies: 3.8% and 4.2%, respectively. Coming in second place, Financial companies posted a 2014 funding ratio of 92.8%, followed by the Consumer Discretionary sector's 88.0% funding ratio. All sectors saw their funding ratios fall from fiscal year-end 2013 to fiscal year-end 2014.The largest funding ratio decrease on an absolute percentage basis was seen in Health Care, where fiscal 2013's 78.4% funding ratio plunged -12.3% in fiscal 2014 to 82.4%. The second-largest drop was seen in the Financials sector, where companies saw their aggregate funding ratio fall -9.8%, from fiscal 2013's 102.6% to fiscal 2014's 92.8%.

The Concentration of Plan Assets and Liabilities

While the aggregated pool of S&P 500 Index defined benefit plans is 82.5% 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 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 299 Corporate DB Pension Plans by Fiscal 2014 Assets and Liabilities

	Assets	Liabilities	Median Funded Ratio	Funded Ratio Range
25 Largest Plans	50.0%	50.9%	77.1%	42.8% to 98.5%
100 Smallest Plans	2.7%	2.8%	80.5%	33.0% to 137.2%

The largest 25 plans when ranked by assets and liabilities represent 50.0% and 50.9% of assets and liabilities, respectively, of the 299 total plans. The median funded ratios stand at 77.1% and 80.5% for the 25 largest and 100 smallest plans, respectively.

Exhibit 7 plots all of the 299 plans sampled in this study based on their 2014 year-end funded ratio and plan liability size. The essentially flat slope of the trend line for this data set suggests there is no correlation between funded ratio and liability size, and this is confirmed by the near-zero R-square for these data series:

Exhibit 7
Liability Size and Funding Ratio, Fiscal Year-End 2014

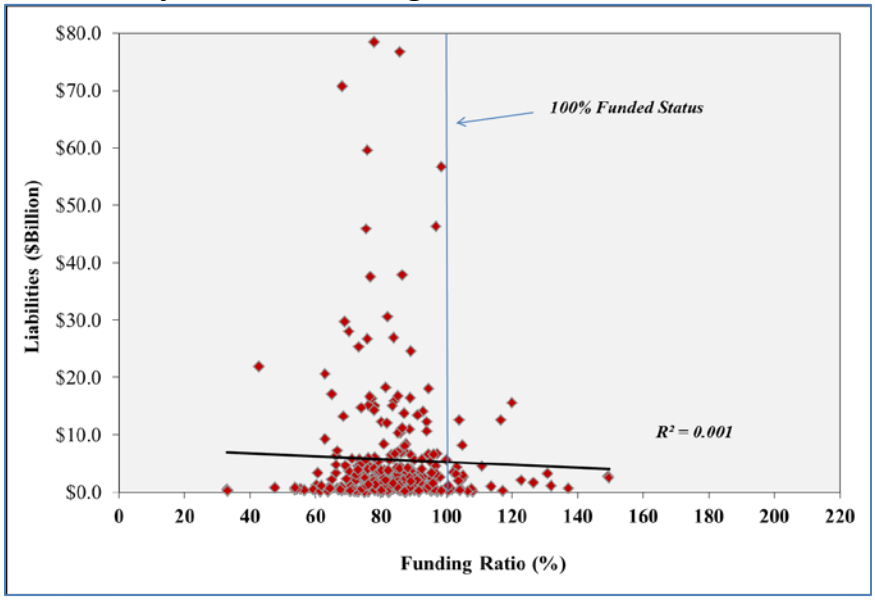


Exhibit 8 provides a combined accounting of S&P 500 Index corporate pension plans for the 2014 fiscal year:

Exhibit 8
Change in Assets and Liabilities for 2014

		$Billion	% of BOY
Liabilities - Beginning of Year (BOY)	$	**1,489.0**	
Service costs		26.7	1.8%
Interest costs		69.0	4.6%
Benefit payments		(90.6)	-6.1%
Actuarial losses (gains)		219.9	14.8%
Other		(20.3)	-1.4%
Liabilities - End of Year (EOY)	$	**1,693.7**	**13.7%**
Assets - Beginning of Year (BOY)	$	**1,335.6**	
Contributions		36.6	2.7%
Actual return on assets		129.0	9.7%
Benefit payments		(90.6)	-6.8%
Other		(12.9)	-1.0%
Assets - End of Year (EOY)	$	**1,397.6**	**4.6%**

Note: 9.7% actual return on assets is based on beginning of year asset value.

Pension Plan Liabilities

There are three recurring items that 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 $26.7 billion, or 1.8%, to aggregate pension liabilities in 2014. 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 $5.1 billion, or 0.3%. Instead, liabilities increased by $204.7 billion, or 13.7%, in 2014. A portion of the difference lies within the "other" category. The "other" category refers to changes in liabilities, either negative or positive, that arise from the addition or subtraction of liabilities from plan changes, curtailments, or corporate acquisition activity. Large dollar figures in the "other" category are often the result of corporate mergers and acquisitions, in which the resultant company absorbs the pension liability of the components; one also finds liability changes due to pension plan amendments and settlements folded into "other". When that happens, there also is a corresponding entry into the "other" category under Assets. There were a handful of sizable decreases in fund liabilities during fiscal 2014, attributed to company spinoffs, M&A activity, pension benefit settlements and/or adoption of new actuarial mortality tables:

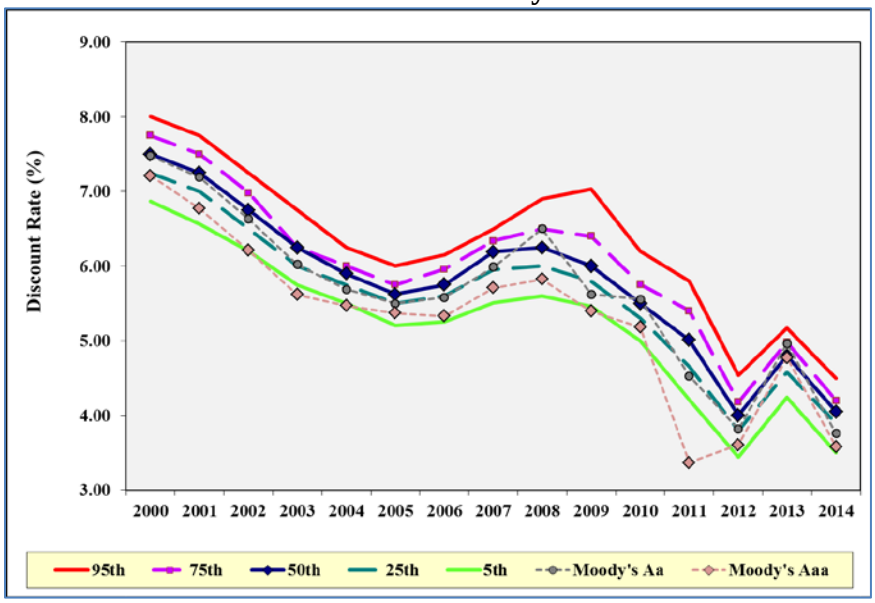
- Boeing Company (-$2.5 billion, noted in their 2014 10-K as "Settlement/Curtailment/Other");
- Bristol-Myers Squibb Company (-$2.0 billion, primarily due to BMY's announced transfer of certain U.S. pension assets to the Prudential Insurance Company via group annuity contract purchase);
- Intel Corp. (-$1.1 billion, subsequent to freezing future benefit accruals in the U.S. Intel Minimum Pension Plan as of January 1, 2015);
- Lockheed Martin (-$4.6 billion, attributable to LMT's freezing of the pay-based component of the benefit formula for the qualified DB pension obligation);
- Motorola Solutions, Inc. (-$4.2 billion, attributable to MSI's announced transfer of certain U.S. pension assets to the Prudential Insurance Company via group annuity contract purchase).

The only increase in pension liability over $1 billion categorized as an "Other" event during fiscal 2014 was that of Tyson Foods, Inc.; TSN's pension obligation increased $1.8 billion subsequent to its acquisition of Hillshire Brands Company.

Another 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 experience differs from the actuarial assumptions. The most significant actuarial losses (gains) occur due 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, the median discount rate increased from 2005, marking a turn in direction from the previous five year trend. Median discount rates increased through year-end 2008, where the rate stood at 6.25%. The 2009, 2010, 2011 and 2012 fiscal years all saw discount rates fall, leading to an aggregate actuarial loss and contributing to the overall increase in aggregate pension liabilities over the past four fiscal years. In fiscal 2013 interest rates rose sharply, especially in the second half of the year, leading to sizable actuarial gains and decreases in corporate pension plans' actuarial liabilities. Fiscal 2014 saw interest rates fall, contributing to actuarial losses over the year; the adoption of updated mortality tables for accounting liability calculation also increased actuarial losses for the fiscal year.

Exhibit 9 shows the distribution of discount rates used by S&P 500 Index companies to value their benefit obligations from 2000 to 2014. The median, or 50th percentile, discount rate had risen from 5.62% in 2005 to 6.25% in 2008, but fell back over the next four years, with the fiscal year-end 2012 median rate settling at 4.00%. Fiscal 2013 saw that trend reverse, with the median discount rate ending the year a full 80 basis points higher at 4.80%. Discount rates fell again in fiscal 2014, with the median rate falling 75 bps to 4.05%:

Exhibit 9
ASC 715 Discount Rate by Percentile



Each year companies select an ASC 715 discount rate that approximates a settlement rate for their pension liabilities, taking into consideration the current rates of return on high-quality corporate bonds. 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 the accounting value of total pension liabilities. However from year-end 2005 to year-end 2008, both Aa and Aaa corporate bond yields trended up, ending 2008 at 6.50% and 5.82% respectively. Reflecting the overall normalization of credit spreads over 2009 and 2010, these yields have fallen from their 2008 levels; the Aa and Aaa yields stood at 5.56% and 5.18% respectively as of 12/31/2010. However, the global equity market volatility of 2011, and the unprecedented move by Standard & Poor's to downgrade U.S. Treasury debt, sparked a flight to quality that drove U.S. Treasury yields down to historic lows. Higher-quality corporate yields also plunged; Aa and Aaa yields ended 2011 at 4.53% and 3.37%, respectively. Although global equity markets enjoyed robust performance during 2012, the financial crises striking the Eurozone drove U.S. Treasury yields even lower by year-end. As noted above, interest rates rose sharply over fiscal 2013; unsurprisingly, corporate Aaa and Aa bond yields followed Treasury yields higher. However, 2014 reversed the yield increases of 2013, with yields on Treasury and benchmark Aaa and Aa corporates falling notably from the prior year-end. Exhibit 9 plots these year-end corporate bond yields alongside the historical distribution of discount rates.

Pension Plan Assets

There are three recurring items that cause changes in plan assets: corporate contributions, investment return and benefit payments. We will now consider each separately.

The first item is corporate contributions to the pension plan, which totaled $36.6 billion or 3.0% of assets during 2014. 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.

Unfortunately, we are not in an ideal situation. The pension expense follows the ASC 715 accounting rules, while the cash contributions must follow the funding rules dictated by the Internal Revenue Code and associated regulations. The funding methods and the required actuarial assumptions are different for funding and accounting purposes. For example, as mentioned above the accounting liability discount rates are based on Aaa- and Aa-rated bonds. Funding includes A-rated bonds. In addition, funding only recognizes salary increases for one year while accounting recognizes increases until retirement. Thus, even the value of benefits earned in a given year (service cost) will not be equal.

The funding rules determine a minimum required contribution as well as a maximum deductible contribution. If the accounting expense is between the calculated minimum and maximum, companies may choose to contribute an amount equal to the pension expense. Otherwise, a compliant plan will have a contribution amount that will not equal the accounting expense.

The Pension Protection Act of 2006 (PPA) radically changed the funding methodologies for cash requirements; it was first effective for the 2008 plan year. There have been incremental changes to these rules since 2008. A material change in 2012 was part of the Moving Ahead for Progress in the 21st Century (MAP-21) law. MAP-21 delayed recognition of the current low interest rates environment by introducing a 25 year smoothing of interest rates. MAP-21 was designed to have the largest impact for 2012 plan years with the impact shrinking over a few subsequent years. Further funding relief was passed in 2014 as a part of the Highway and Transportation Funding Act of 2014 (HATFA-2014). HATFA-2014 extends the pension plan funding stabilization provisions included in MAP-21 for an additional five years. It is likely that contributions will need to be increased starting in 2021 unless interest rates increase between now and then. These laws are effectively saying that rates are historically low and companies will be provided with some funding relief for a few years while interest rates increase. If rates don't increase, the current period reduced funding levels will be paid for with much higher contributions later.

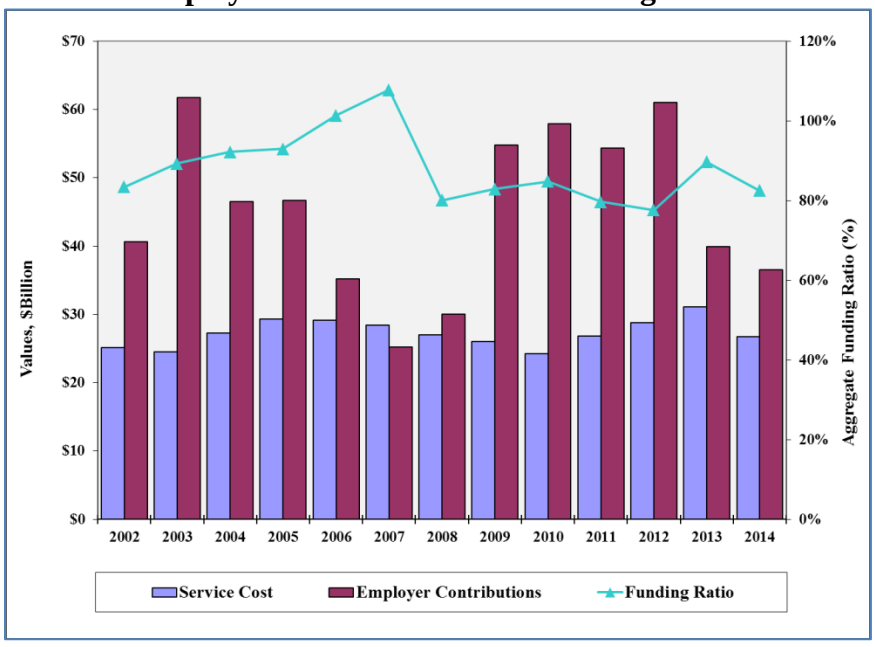
One of the goals of the PPA is to fund any shortfalls over a seven year period. That generally requires faster funding than the previous laws.

One final complicating factor when comparing cash contributions to the cash flows reported for accounting purposes is that the minimum required cash contribution for a plan year may be paid as late as 8.5 months after the end of the plan year (fiscal year).

Thus, cash contributions dramatically increased in 2009 to reflect the impact of PPA first effective in 2008. Cash contributions decreased in 2013 and 2014, partially reflecting the reduction in cash requirements afforded by MAP-21 and HATFA-2014 first effective for the 2012 and 2014 plan years, respectively.

Below in Exhibit 10, service costs and employer contributions are charted against funding ratios from 2002 to 2014. Reflecting the impact of funding levels on plan contributions, it is clear that company contributions slowed as market returns boosted funding levels. Given the recent decline in the aggregate funding ratio for 2008 and the impact of PPA, the companies in this study dramatically increased their aggregate contributions to their DB plans in calendar 2009 and maintained increased contribution levels through fiscal 2012. However, the impact of MAP-21 allowed companies to reduce their fiscal 2013 and 2014 contributions. Strong global equity market performance and higher discount rates during fiscal 2013 contributed to improved corporate plan funding ratios for that year. However, despite strong capital market performance in fiscal 2014, lower liability discount rates and adoption of RP-2014 actuarial mortality tables increased accounting liabilities and lowered corporate funding ratios for 2014:

Exhibit 10
Employer Contributions and Funding Ratio



In 2014, the $36.6 billion in company contributions noted above exceeded the $26.7 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 markedly below 100%, indicative of an effort to reach 100% funding status, and under-contributing relative to the level of service costs when funding ratios are slightly below or exceed 100%.

The second item is the actual return on plan assets, which posted a healthy aggregate $129.0 billion gain for 2014. The following table presents the aggregate performance of plan assets for S&P 500 companies since 2001, as well as the growth in assets and liabilities from all sources, including investment performance:

Exhibit 11
S&P 500 Company DB Plan Aggregate Returns on Assets and Liabilities, 2001-2014

	Annual Aggregate Asset Performance (%)	Annual Aggregate Growth in Plan Assets from All Sources (%)	Aggregate Liability Growth from All Sources (%)	Funding Ratio (%)
2001	-7.3%	-12.2%	7.8%	103.5%
2002	-8.4%	-10.6%	10.9%	83.4%
2003	19.0%	17.8%	10.7%	89.3%
2004	12.5%	10.3%	7.5%	92.2%
2005	10.4%	9.7%	8.1%	93.0%
2006	13.0%	11.9%	2.7%	101.4%
2007	10.4%	7.3%	0.5%	107.8%
2008	-19.5%	-24.0%	1.8%	80.1%
2009	13.3%	12.4%	8.1%	82.9%
2010	13.2%	12.0%	9.2%	84.9%
2011	5.4%	4.5%	11.3%	79.7%
2012	11.9%	10.2%	12.5%	77.6%
2013	10.1%	5.6%	-8.8%	89.7%
2014	9.7%	4.6%	13.7%	82.5%

The annual aggregate asset performance shown in the first column of Exhibit 11 is defined as reported actual return on plan investments as a percentage of beginning-of-fiscal year assets. The next column displays the annual aggregate growth in plan assets from investment performance and all other recurring and non-recurring items impacting plan asset valuation. This is directly comparable to the next column item, aggregate liability growth from all sources. The last column shows the aggregate S&P 500 DB plan funding ratio for each fiscal year, calculated from data shown in Exhibit 1 above.

The following exhibit displays these plan data in terms of growth of $100 since December 31, 2000, alongside benchmarks for U.S. stocks (Wilshire 5000 Total Market Index^{SM}) and U.S. bonds (Barclays U.S. Aggregate Index):

Exhibit 12
Growth of $100 for S&P 500 DB Plan Asset Returns and Liabilities, 2001-2014

Index data source: Wilshire Compass[SM]

The third recurring item affecting plan assets is benefit payments, which totaled $90.6 billion in fiscal 2014 and reduced assets and liabilities by the same amount.

The final item impacting liabilities and assets is "Other" and largely represents unrecognized prior service cost, curtailments, settlements and/or corporate merger and acquisition/divestment and spinoff activity adding or subtracting the pension plans from companies that were acquired/divested. These types of corporate actions typically also involve commensurate changes in pension plan costs, so the plans in our survey with the largest impacts of "Other" items on pension assets are the same plans with large "Other" items impacting pension cost.

During the past year, a 4.6% net increase in assets (from all recurring and non-recurring items) was offset by a 13.7% net increase in liabilities, resulting in a decrease in aggregate funding ratio from 89.7% to 82.5%.

The Impact of Pension Expense (Income) on Corporate Earnings

Exhibit 11 provides an aggregate accounting of pension expense (income) for calendar 2014 for the 299 S&P 500 Index companies in our study:

Exhibit 13
Calculation of 2014 Pension Expense (Income)

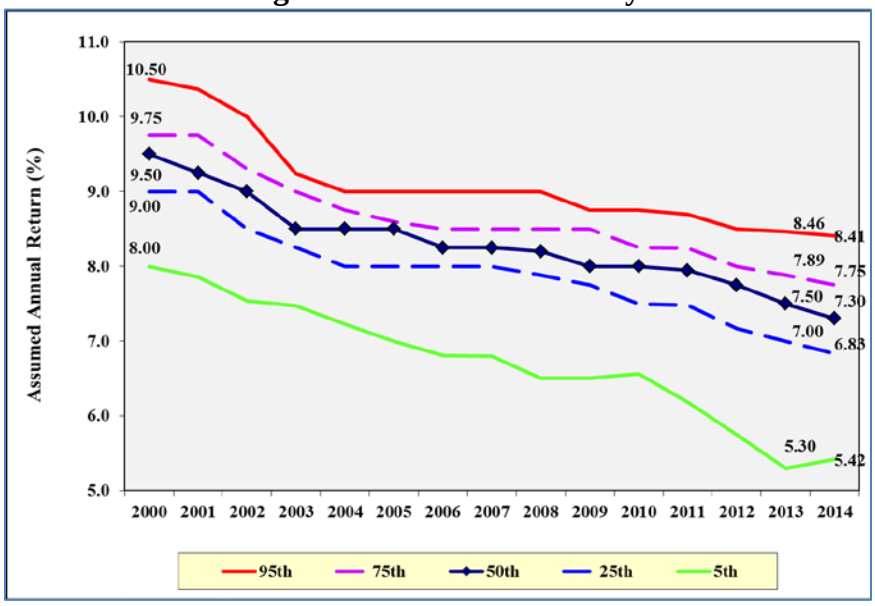
		$ Billion
Service Costs	$	26.7
Interest Costs		69.0
Expected Return on Plan Assets		(94.6)
Losses (Gains)		42.5
Pension Expense (Income)	$	43.5

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 $129.0 billion gain, in calculating pension expense (income). This would be consistent pension accounting under International Financial Reporting Standards (IFRS). If this were so, aggregate pension expense would equal $9.2 billion in 2014. Instead, pension expense was $43.5 billion in 2014 because of the method by which asset return is reflected (using expected return on assets rather than actual return). The expected return on plan assets is calculated using a "Market Related Value of Assets" (MRVA) and an expected rate of return on assets. The MRVA allows plan sponsors the ability to amortize asset gains and losses over a period of up to 5 years. This helps to reduce the short-term volatility of asset returns on corporate net income.

The expected rate of return for pension assets has been coming down in recent years (see Exhibit 14 below). The median expected return was 9.50% at the end of 2000 and has fallen to 7.30% at the end of 2014. 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 2014, companies collectively expected their assets to earn $94.6 billion, and it was this number that was used in the calculation of pension expense and corporate net income. However, pension plans incurred actual gains of $129.0 billion, which represents a $34.3 billion net surplus for the funding ratio.

The fourth item, Losses (Gains), primarily represents the difference between actual and expected asset and liability growth, but it also includes prior service cost amortizations, settlements and curtailments.

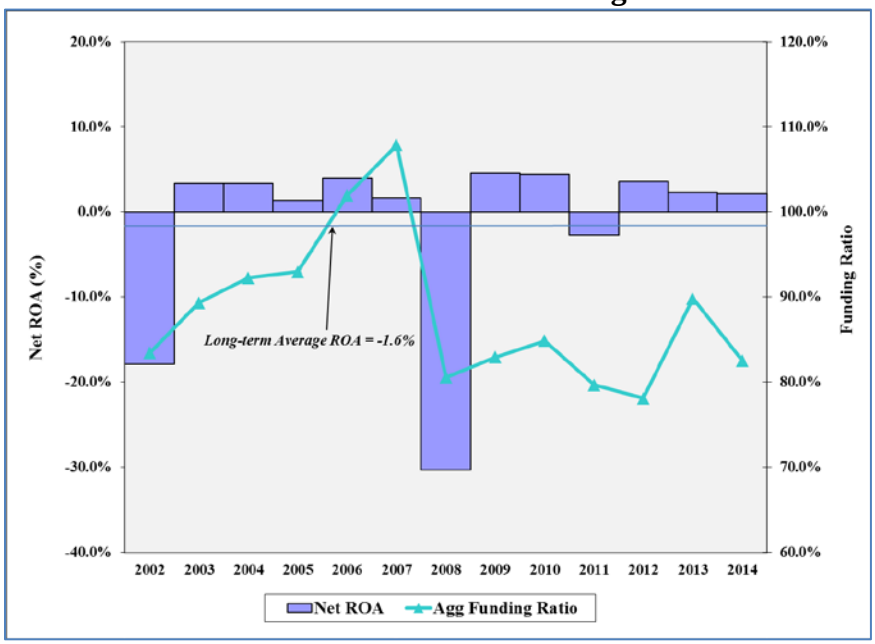
Exhibit 14
ASC 715 Long-Run Return on Assets by Percentile



Although the median expected return on plan assets assumption has fallen during the past thirteen years, from 9.50% in 2000 to 7.30% in 2014, 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 5.3%, based on the average asset allocation of corporate pension plans as noted in the companies' 10-Ks and our current capital market return and risk assumptions (summarized below). However, individual pension plan expected returns will vary considerably depending upon their unique asset allocation. It should be noted that Wilshire Consulting's asset class return forecasts are 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 return assumptions represent beta only (i.e., returns from capital market exposure), with no projection of alpha from active management. Please see *Pension Plan Asset Allocation* below.

In Exhibit 15, 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 2014. 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 steady pace; however, in years of large market disruption, funding ratios can give back gains of several years abruptly. Both the funding rules and the accounting expense rules include smoothing techniques so, although cash contributions and pension expense follow a general pattern based on the market value funded ratio, they do not drive one another.

Exhibit 15
Net Return on Assets and Funding Ratios

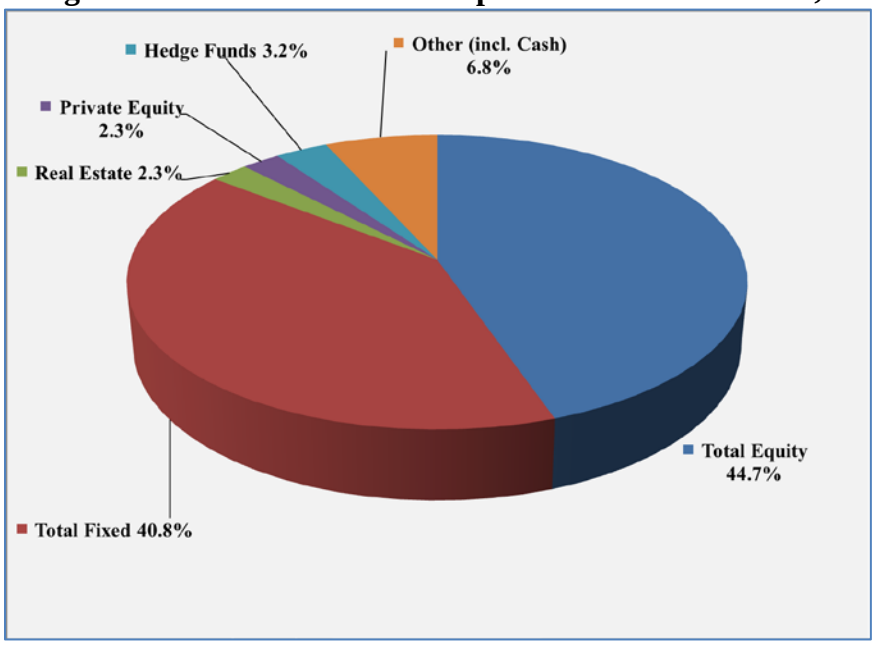


If the deflating of the technology bubble at the turn of the century is viewed as an analogous event to the recent global recession, several factors are required to recover the funded status. Assets need to grow while liabilities stay constant or shrink. Positive market returns for several years forward 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. As displayed in Exhibit 9, interest rates need to increase, or at least stop decreasing, for the liabilities to not cancel the improvements of the assets. The biggest improvements in the funding ratio occur in years such as 2013 with increasing interest rates as well as good market returns.

Pension Plan Asset Allocation

We now turn to the asset allocation of these 299 corporate pension plans. Exhibit 16 summarizes the average asset class exposures of these funds at fiscal year-end 2014:

Exhibit 16
Average Asset Allocation of 299 Corporate DB Pension Plans, 2014



Portfolio expected returns and risk forecasts are calculated by combining Wilshire's current forward-looking assumptions for the major asset classes and each retirement system's actual asset allocation. These long-term return and risk assumptions[3] are illustrated in Exhibit 17:

Exhibit 17
Wilshire Consulting's 2015 Asset Class Assumptions

	Expected Return (%)	Risk (%)
US Equity	6.25	17.00
Non-US Equity	6.25	18.00
Global Equity	6.45	17.15
US Bonds	3.35	5.00
Non-US Bonds	1.65	3.50
Real Estate	4.85	17.00
Private Equity	8.80	27.50
Hedge Funds	3.85	6.50

Exhibit 18 contains summary statistics on asset allocation for these corporate DB plans. The median allocation[4] of public markets equity is 45.8%, compared to 37.8% for public

[3] Foresti, Steven J., Michael E. Rush, CFA and Russell J. Walker, **2015 Asset Allocation Return and Risk Assumptions**, Wilshire Consulting Investment Research publication, January 27, 2015.
[4] The "Median" column in Exhibit 18 represents the median for each asset class and therefore does not sum to 100%. The median expected return is based on the median fund return, not on the median asset mix.

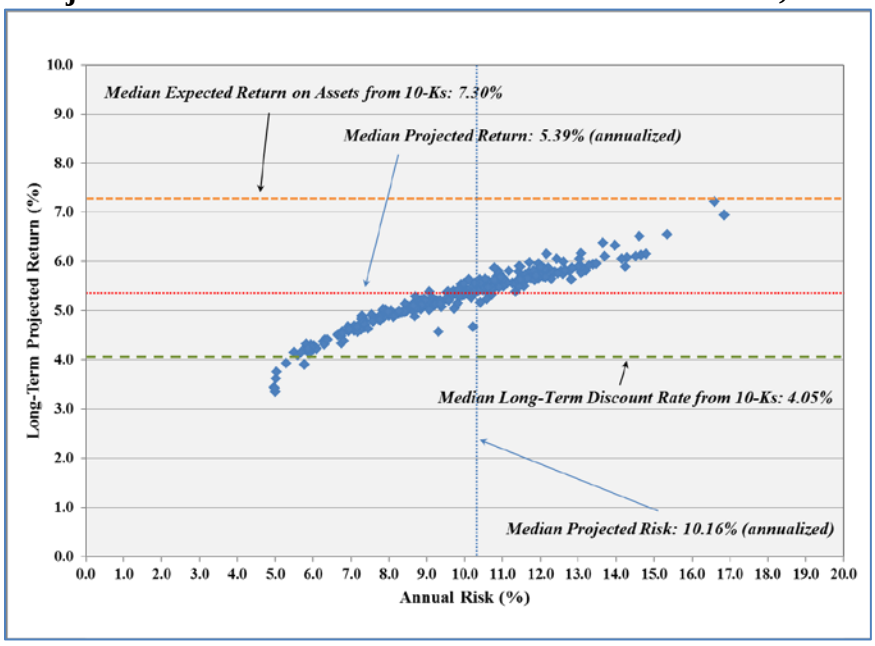
markets fixed income assets. However, as the lowest and highest columns suggest, there is considerable variability in allocations among individual systems. Using Wilshire's asset class assumptions to calculate return projections, the median corporate DB plan in this sample has an expected return of 5.39% (compared to a 5.33% return calculated using average asset exposures, as cited above). This result is 1.91% less than the current median expected return on assets (as stated in the companies' 10-Ks) of 7.30%, but 1.34% above the median plan long-term discount rate of 4.05%:

Exhibit 18
Summary Asset Allocation Statistics for 299 S&P 500 DB Plans, 2014

	Lowest	Median	Highest
Total Equity	0.0%	45.8%	83.2%
Total Fixed	1.0%	37.8%	99.0%
Real Estate	0.0%	0.0%	20.0%
Private Equity	0.0%	0.0%	35.1%
Hedge Funds	0.0%	0.0%	60.6%
Other (incl. Cash)	-0.2%	3.5%	70.9%
Expected Return	3.4%	5.4%	7.2%
Expected Risk	5.0%	10.2%	16.9%

The next exhibit presents the risk/return profile of these plans as of year-end 2014 using Wilshire-calculated projected long-term rates of return and standard deviation of returns for each plan. Two horizontal lines plot the median expected ROA and median long-term discount rate for the plans; the median projected plan return and risk are also plotted as dotted horizontal and vertical lines, respectively:

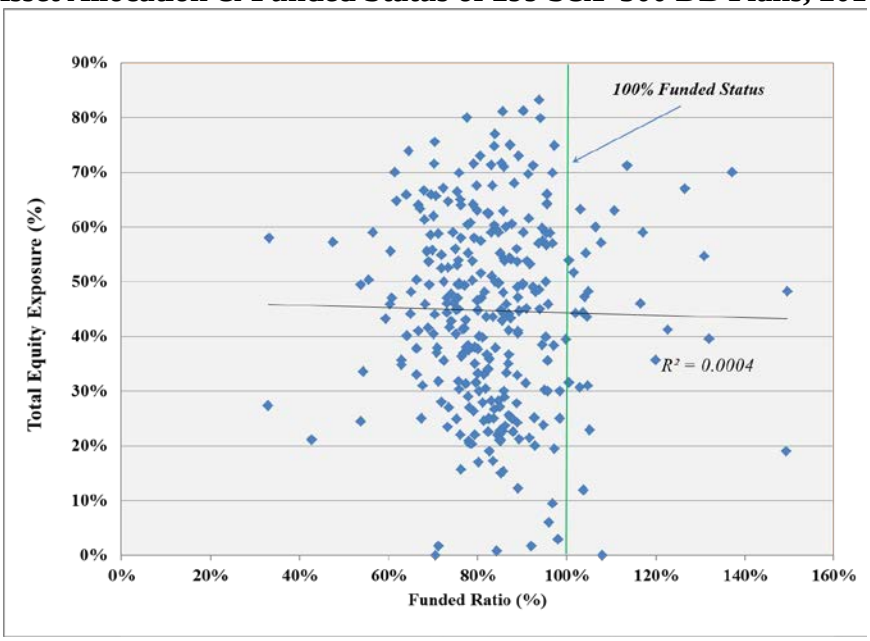
Exhibit 19
Projected Risk/Return Profile of 299 S&P 500 DB Plans, 2014



Performance statistics projected using Wilshire Consulting 2015 AC Assumptions

Exhibit 20 addresses the relationship between asset allocation and funding for the 299 corporate plans in our study. Allocations to equity asset classes, which serve as proxies for investment aggressiveness, are plotted on the vertical scale, with funding ratios plotted on the horizontal scale:

Exhibit 20
Asset Allocation & Funded Status of 299 S&P 500 DB Plans, 2014



The vertical line at 100% funded ratio visually separates under- and overfunded plans. A casual glance at the plot suggests no discernable relationship between equity allocation and funded status; indeed, the r-squared of the two data series calculates to nearly zero (0.0004), indicating a near-random relationship. The corporate DB pension plans in our study show a broad spectrum of asset allocations that appear to be unrelated to their funded status.[5]

[5] We would like to thank Ami Adjoh, Evan Benedict, Brian Bubrick, Nico Chavez, Keith Lee, Paul Park, Elizabeth Siems and Andrew Treais for their assistance and diligence in the data collection for this year's survey. We would also like to express our gratitude to Ned McGuire for his generous contributions to this report.

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