U.S. Single Employer Pension Plan Contribution Indices, 2009–2015

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Introduction and Executive Summary

The ultimate goal of funding a pension plan is to provide the plan with enough assets to pay all participants' benefits when they come due. Funding defined benefit pension plans involves many intricate factors that affect contribution levels, including complex funding regulations, discount rates and other actuarial assumptions, investment returns and business objectives and constraints.

The Society of Actuaries is pleased to provide its annual study of contribution indices among single employer pension plans in the United States. For 2015, these plans numbered approximately 28,000 and covered nearly 29 million participants. Contribution indices are metrics for measuring whether pension plan contributions—absent other influences—reduced unfunded liabilities or met other benchmarks such as regulatory requirements.[1]

Using publicly available data from the Department of Labor as of Nov. 14, 2017, this study provides results through the 2015 plan year, with preliminary results for the 2016 plan year based on a partial year of reporting.[2] Note that all distributions presented in this study are weighted by liabilities. Study highlights include the following results:

- For 2015, about 11% of plans had an unfunded liability for 2015 as computed using the smoothed corporate bond rates allowed under current law to discount liabilities and compared with the market value of assets. The 11% is split between about 8% of plans that contributed at least enough to maintain unfunded liabilities and about 3% that failed to do so.[3,4]
- Preliminary results for 2016 show an increase in unfunded liabilities—roughly 27% of plans had unfunded liabilities, compared with 11% for 2015—primarily because of generally low asset returns during 2015 combined with lower smoothed discount rates for 2016, which are both reflected in 2016 funded status.
- When computing liabilities for 2015 using unsmoothed corporate bond rates to discount liabilities,[5] roughly 84% of plans had unfunded liabilities. About 25% of plans contributed at least enough to maintain the unfunded liability, while the remaining 59% fell short.

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[1] Contribution indices are further described in the Contribution Indices section of this report and more fully defined in the original study: *U.S. Single Employer Pension Plan Contribution Indices, 2009–2014*, Society of Actuaries, May 2017, available at https://www.soa.org/research-reports/2016/2016-contrib-indices.

[2] Additional information about the number of plans included in the study and timing of Form 5500 filing is in the Data and Methods section of this report.

[3] Funding requirements for single employer pension plans are defined by Internal Revenue Code §430, as amended by the Moving Ahead for Progress in the 21st Century Act, the Highway and Transportation Funding Act of 2014 and the Bipartisan Budget Act of 2015. In the current economic environment, smoothed rates are higher than unsmoothed rates.

[4] In this context, to maintain the unfunded liability means preventing it from growing, absent influences other than contributions.

[5] For this study, unsmoothed corporate bond rates refer to monthly average spot rates published by Internal Revenue Service as the Treasury High Quality Market Corporate Bond Yield Curve. As monthly averages, these rates are slightly smoothed, but they are essentially unsmoothed relative to the 25-year averaging allowed under current law.

- In general, using smoothed rates, results for 2015 are very similar to those for 2014. However, using unsmoothed corporate bond rates, results for 2015 are generally down from 2014, primarily because the unsmoothed rates for 2015 were significantly lower than for 2014, while the smoothed rates for 2015 were only somewhat lower than for 2014. The Aggregate Liabilities and Funded Status section shows more detail about the rates and their impact on funded status.
- Plan sponsors contributed about $79 billion to their pension plans for 2015. Virtually all plan sponsors contributed at least the minimum amount required by law for 2015; preliminary data for 2016 indicate the same. Under current law, plan liabilities for 2015 totaled $2.0 trillion, 99% of which was funded. About 11% of plans generate the 1% of total liability that was not funded.

Note that this study covers an economic period of falling interest rates. Consequently, averaging historical interest rates results in a rate for discounting liabilities that is higher than the market rate. Higher discount rates produce lesser liabilities, hence lesser unfunded liabilities. During a period of rising interest rates, the opposite would be true.

Contribution Indices

Contribution indices are metrics for measuring—absent other influences—whether pension plan contributions reduced unfunded liabilities in any given year or met another benchmark, such as a regulatory requirement. A plan's contribution index is the ratio of its actual employer contribution to a plan-specific benchmark. A contribution index that exceeds 1.0 means that the contribution exceeded the benchmark, while a contribution index of less than 1.0 means the contribution fell short of the benchmark. When a plan does not have an unfunded liability, it has neither a benchmark nor a contribution index. Note that all contribution indices use the market value of assets to determine unfunded liabilities, unless otherwise specified.

Current funding laws allow smoothing of corporate bond rates used to discount plan liabilities.[6] In the current economic environment, smoothed discount rates are higher than the unsmoothed rates. Higher discount rates generate lesser liabilities and, hence, lesser unfunded liabilities, than unsmoothed rates.

Figure 1 illustrates across all plans the frequency with which contribution indices fell within certain ranges. Throughout this study, all distributions are weighted by plan liabilities, providing a more informative view of the impact as experienced by plan participants as a whole. Under this approach, a single large plan may take up more space within a distribution than many very small plans.

Figure 1 presents contribution indices for five benchmarks:

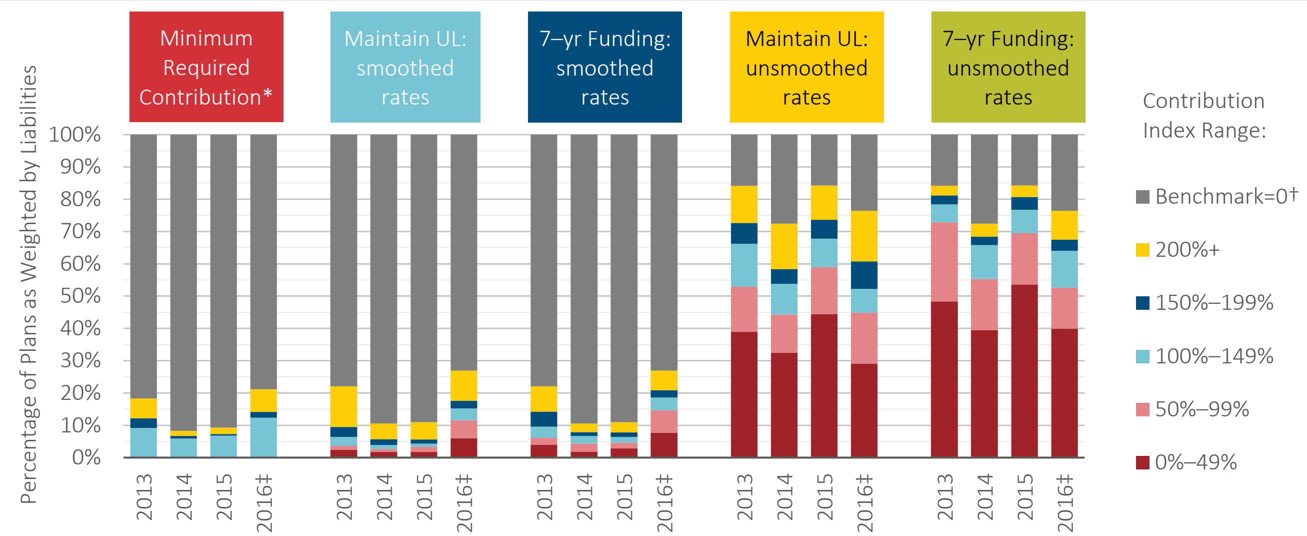
- Minimum Required Contribution as defined by Internal Revenue Code §430 after reflecting all allowable offsets
- Contribution that maintains the unfunded liability, using smoothed discount rates allowed by current law (normal cost plus interest on the unfunded liability)
- Contribution that will eliminate the unfunded liability in 7 years, using smoothed discount rates allowed by current law (normal cost plus 7-year level-amount amortization of the unfunded liability)
- Contribution that maintains the unfunded liability, using unsmoothed discount rates (normal cost plus interest on the unfunded liability)
- Contribution that will eliminate the unfunded liability in 7 years, using unsmoothed discount rates (normal cost plus 7-year level-amount amortization of the unfunded liability)

[6] Internal Revenue Code §430 and accompanying regulations define funding rules for single employer pension plans, including the interest rates used to discount liabilities.

In the years studied, nearly all plans contributed at least their Minimum Required Contribution; less than one-half of 1% of the system failed to contribute at least the Minimum Required Contribution.

Figure 1

ALL PLANS: CONTRIBUTION INDICES BY RANGES



Note: all distributions presented in this study are weighted by plan liabilities, providing a more informative view of the impact as experienced by plan participants across the system as a whole

* After offsetting carryover and prefunding balances

† Data reflect a partial year of reporting.

‡ Indicates either no Minimum Required Contribution or no unfunded liability.

Using the smoothed rates allowed under current law, results for 2015 look similar to those for 2014. While about 99% of the total liability among all plans is funded (see Figure 2), the 1% of liability that is unfunded is attributable to 11% of the plans. The remaining 89% of plans did not have an unfunded liability; hence they had no benchmark. The 11% of plans that had a benchmark was split between about 8% that contributed at least enough to maintain unfunded liabilities and 3% that failed to do so. Turning to the benchmark for the 7-year funding pace, the 11% of plans with benchmarks was split between about 6% of plans with contributions exceeding their benchmarks and about 5% that fell short.

Based on a partial year of reporting, preliminary results for 2016 show more plans with benchmarks—roughly 27%, compared with 11% for 2015—as well as an increase in plans falling short of benchmarks. Nearly 12% failed to maintain the unfunded liability through contributions, and nearly 15% fell short of the 7-year funding benchmark. Increased unfunded liabilities for 2016 primarily stem from a combination of generally low asset returns during 2015 and lower smoothed discount rates for 2016, both of which are reflected in 2016 funded status.

A plan sponsor can contribute the Minimum Required Contribution or more yet fail to meet the benchmark for maintaining its unfunded liability and/or 7-year funding pace. This is primarily because of three provisions in current law, all of which help to smooth contribution fluctuations over time:

- Contribution requirements may be reduced for carryover and prefunding balances, which recognizes that previous contributions exceeded the minimum amount required.

- Asset fluctuations may be smoothed for determining funded status under current law, whereas these benchmarks use the unsmoothed market value of assets. Consequently, assets for determining funded status may be greater or less than market value.
- Amortization for the Minimum Required Contribution uses a layered approach, which can result in an amortization payment that is less than (or greater than) the benchmark approach of a straight amortization of the current unfunded liability.

Many more plans have an unfunded liability when using the lower, unsmoothed discount rates than when using the higher, smoothed rates allowed under current law (see Figure 2 for aggregate funded status).[7] While 86% of the total liability is funded, the unfunded liabilities come from about 84% of plans.

The 84% was split between about 25% that exceeded their benchmarks for maintaining their unfunded liability and 59% that fell short of preventing their unfunded liability from growing. Looking at it another way, the 84% was split between about 15% that contributed enough to eliminate their unfunded liability within 7 years and 69% that fell short of that benchmark. Somewhat fewer plans met their benchmarks for 2015 than for 2014, but preliminary 2016 results look closer to 2014 findings.

Note that this study covers an economic period of falling interest rates. Consequently, averaging historical interest rates results in a rate for discounting liabilities that is higher than the market rate. Higher discount rates produce lesser liabilities, hence lesser unfunded liabilities. During a period of rising interest rates, the opposite would be true.

Current law phases out the smoothing of discount rates over time. In the current economic environment, if all other items are equal, as smoothing lessens, liabilities will increase significantly, and contributions will tend to increase in order to pay down unfunded liabilities.

As previously noted, funding defined benefit pension plans involves many intricate factors that affect contribution levels, including complex funding regulations, discount rates and other actuarial assumptions, investment returns, changes among the plan population, and business objectives and constraints. Contribution indices provide one means for measuring one of those components in isolation.

Aggregate Liabilities and Funded Status

To provide a general context for contribution indices, this study reports aggregate liabilities and funded status among single employer pension plans. Analysis of funded status beyond the broadest overview is beyond the scope of this study.

As Figure 2 shows, using smoothed rates per current funding rules for single employer plans, the total liability for 2015 of $2.0 trillion was 99% funded, with an aggregate unfunded liability of about $25 billion. These results represent a slight increase in funded ratio from 2014, when the total liability of $1.9 trillion was 98% funded in aggregate, with an unfunded liability of about $30 billion.

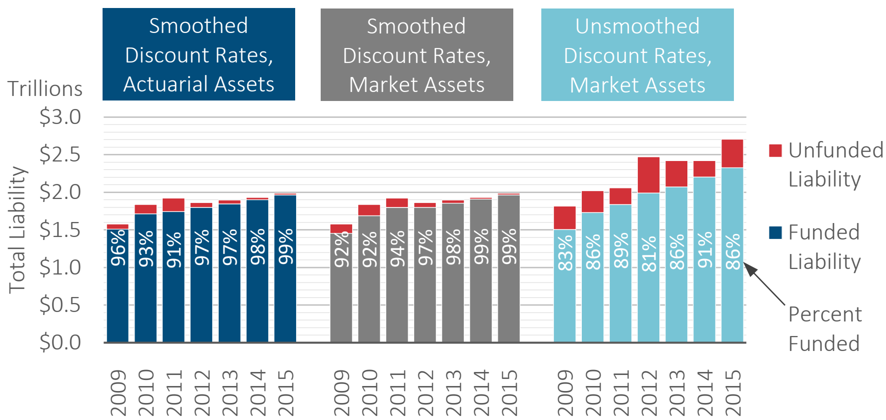
Current law allows significant smoothing of corporate bond rates to discount liabilities, with the smoothing effect becoming more restricted starting in 2021. Current law also allows smoothing of asset fluctuations for the actuarial value of assets.[8] Using unsmoothed rates and the market value of assets, the authors estimate the total liability for 2015 to be $2.7 trillion with an unfunded liability against the market value of assets of about $380 billion, or 86% funded. This represents a drop in funded status from 2014, when the authors estimated the total liability to be $2.4 trillion with an unfunded liability of about $220 billion, or 91% funded.

[7] In the current economic environment, smoothing (averaging) current and historical corporate bond rates results in a higher discount rate than current, unsmoothed rates.

[8] Internal Revenue Code §430 and accompanying regulations define funding rules for single employer pension plans, including the interest rates used to discount liabilities. Current rules include smoothing (averaging) of high-quality corporate bond rates.

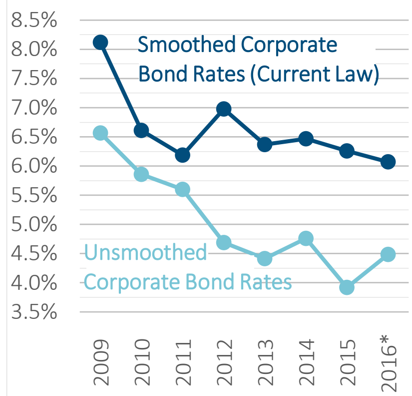
Figure 3 demonstrates the effect of smoothing on discount rates. In the years studied, unsmoothed high-quality corporate bond rates have been considerably lower than the smoothed rates used under current law. Again, all distributions presented in this study are weighted by liabilities.

Figure 2
AGGREGATE LIABILITIES AND FUNDED STATUS



Note: Internal Revenue Code §430 and accompanying regulations define funding rules for single employer pension plans, including the interest rates used to discount liabilities.

Figure 3
MEDIAN DISCOUNT RATES



Note: all distributions presented in this study are weighted by plan liabilities.
* Partial year of data

Data and Methods

Analysis is based on publicly available data from the Department of Labor Form 5500 as of Nov. 14, 2017, which reflects completed reporting for plan years through 2015 and a partial year of reporting for 2016. Note that with typical extensions, Form 5500 is generally due 9½ months after the end of the plan year. For example, for a plan year that runs from Jan. 1, 2016, through Dec. 31, 2016, Form 5500 is due Oct. 15, 2017.

Data for 2015 included in this study reflects about 38,000 plans covering nearly 29 million participants. The partial year of reporting for 2016 reflects about 33,000 plans covering about 24 million participants. Thus, relative to 2015 data, the 2016 data represents approximately 87% of plans and about 83% of participants.

Other than adjustments for obvious errors, data were used as reported. The use of the reported values is not intended to provide commentary on the appropriateness of the underlying actuarial assumptions and methods for funding these plans or any other purpose.

Liabilities based on unsmoothed corporate bond rates were estimated by adjusting plans' reported liabilities and normal cost to approximate liabilities computed on the same valuation date, using monthly average spot rates published by Internal Revenue Service as the Treasury High Quality Market Corporate Bond Yield Curve. Being monthly averages, these rates are slightly smoothed. However, compared with the 25-year averaging of rates allowed under current law, these rates are essentially unsmoothed. In this study, the authors refer to them as unsmoothed for convenience.

The estimation techniques were developed for the single employer defined benefit system as a whole and may not be appropriate for any given plan. Modifications to the assumptions and methods used may result in different numerical outcomes, but the overall conclusions are likely to be similar. Different assumptions and methods may be more appropriate for analysis of a specific plan or small set of plans.

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