

Pension Pulse

FALL 2014

IN THIS ISSUE

Waiting for rates to rise, funded status takes a slight downturn

After 2013's monumental gains, Corporate America's pensions have eased up on the throttle this year.

Aligning DB plan strategy with the new mortality tables

Revised mortality tables are coming soon. Here are some steps pensions can take to get ready.

Continuing trend: pension smoothing

Congress extends funding relief, turning corporate DB plans into unconventional revenue sources. We take a closer look at the implications for sponsor contributions.

Blending the two effects: increasing longevity and pension relief

Longevity increase + pension relief: What does it add up to? We assess the net impact of the year's good news/bad news stories on funded status.

Landmark pension research (second in a series)

In this edition, we investigate Fischer Black's 1980 pension tax arbitrage model.

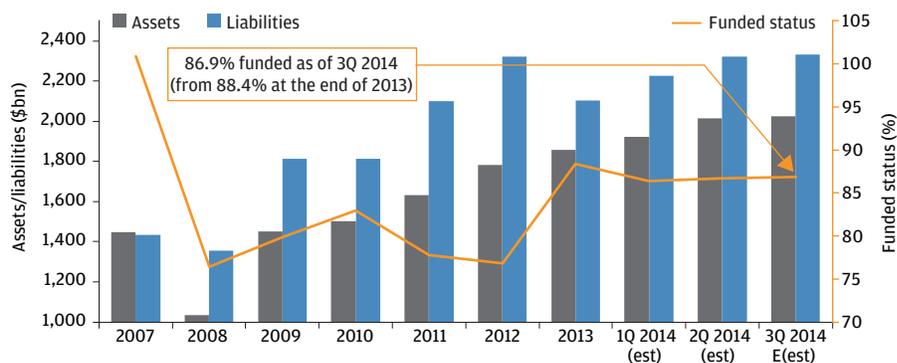
Funded status outlook from global markets strategist Michael Hood

Waiting for rates to rise, funded status takes a slight downturn

In 2013, the double espresso shot of a powerful stock market rally and higher interest rates, which shrank projected long-term liabilities, drove Corporate America's pension funded status up 11.6%, to 88.4%, a post-crisis high. Since the beginning of 2014, however, ebbing rates as well as relatively moderate asset returns have combined to take a bit of the edge off the gains. Aggregate funded status had slipped back 150 basis points (bps) to 86.9% by the end of the 3Q of 2014 (Exhibit 1).

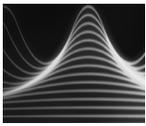
After the gains of 2013, Corporate America has coasted to a marginally lower funded status in 2014

EXHIBIT 1: CORPORATE AMERICA: PENSION ASSETS VS. LIABILITIES, 2007–3Q 2014



Source: J.P. Morgan.

Historical data for 2007 is based on Russell 3000 company 10-Ks and data from Bloomberg; data as of September 30, 2014. Estimates for 2014 are solely based on market moves and do not include contributions, service costs and benefit payments.



The contribution story: more regulatory relief

Corporate plan sponsors reacted to improved funded status in 2013 by cutting their pension contributions by a third, to \$60 billion from \$90 billion in 2012, based on our analysis of data published in companies' 10-K statements for fiscal year 2013 (Exhibit 2). The funded status improvements in 2013 significantly reduced required contributions. In addition, many plans chose to take advantage of the pension relief in the Moving Ahead for Progress in the 21st Century Act (MAP-21), which passed in July 2012. MAP-21 permitted pensions to discount their liabilities at above-market rates, thereby reducing required contributions.

Although MAP-21 undoubtedly influenced contribution strategies, we cannot say regulation is the dominant variable. Plan sponsors' fundamental corporate objectives and performance enter into the calculation. Moreover, the largest plans tend to account for an inordinate share of contributions from year to year—in 2012 the five largest contributors accounted for \$17.6 billion in contributions, or nearly 20% of the total made by Russell 3000 companies, and in 2013 for \$11.5 billion, or 18% as shown in Exhibit 2.¹

As if the decline in funded status, the volatility of market discount rates and the changing strategies of the biggest plan

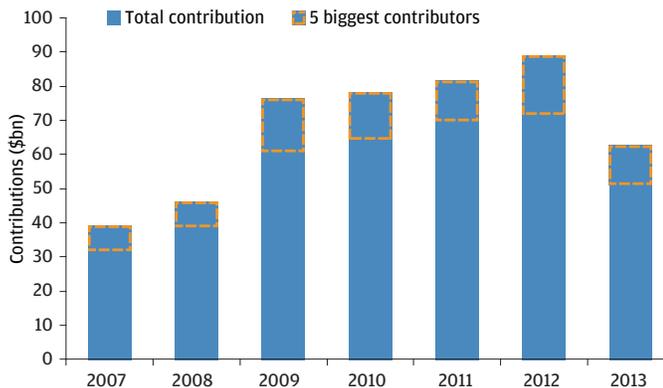
sponsors have not complicated 2014 contribution forecasts enough, several extraneous factors add to the uncertainty. The newly passed Highway and Transportation Funding Act of 2014 (HATFA-14) not only extends MAP-21 but adjusts discount rates higher than the original act, ultimately resulting in lower contributions. At the same time, the forthcoming update on longevity projections could generate a headwind that will offset the benefit from HATFA-14's tailwind. We will discuss the impact of these changes in the later sections.

The funded status story: more underfunded plans, increased pension exposure

Although funded status changed only marginally for Corporate America as a whole this year, the impact on individual plans varied substantially. We estimate that by the end of 3Q 2014, funded status had dropped below 80% for 41% of all plans, compared with 35% of plans at the beginning of the year (Exhibit 3). Even with a rising equity market this year, pension exposure (the ratio of projected benefit obligations to market cap) increased for the median plan from 9.3% at year-end 2013 to 10.3% by the end of 3Q 2014.

Plan sponsors reacted to improved funded status by slashing pension contributions last year

EXHIBIT 2: RUSSELL 3000 PLANS' AGGREGATE CONTRIBUTIONS

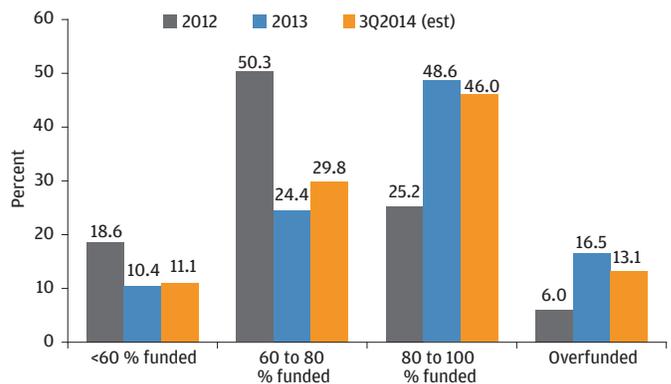


Source: J.P. Morgan.

Historical data for 2007-13 is based on Russell 3000 company 10-Ks and data from Bloomberg; data as of September 30, 2014.

The number of plans with funding ratios of 80% or less has grown to 40.9% today from 34.5% at the end of last year

EXHIBIT 3: FUNDED STATUS DISTRIBUTION 2011-3Q2014



Source: J.P. Morgan; data as of September 30, 2014.

¹ In 2012, the five largest contributors were Ford, Verizon, Lockheed Martin, General Motors and Exxon Mobil. In 2013, they were Ford and Lockheed Martin again, plus Boeing, Chevron and Goodyear.

Aligning DB plan strategy with the new mortality tables

In February 2014, the Society of Actuaries (SOA) released an updated mortality table, RP-2014, and mortality projection, “MP-2014,” with longer life-expectancy projections and higher mortality improvement rates.² The new releases could well increase defined benefit pension liabilities by 3%-8%, with plans covering older workforces exposed to the biggest increases.³

The timeline for implementing the new tables is not yet certain. Because the IRS has already published mortality tables for 2014 and 2015, the updated tables should not affect funding requirements and lump-sum conversions until 2016. In any event, plans will have some discretion as to when to adopt the new tables for accounting purposes. Questions of timing notwithstanding, the resulting changes in funded status and liability duration could persuade plan sponsors to re-evaluate previous asset allocation decisions. We therefore encourage plan sponsors to familiarize themselves with the details of the coming change, evaluate the possible impacts on their plans and consider suitable investment, funding and risk transfer strategies. Below we call attention to key features in the update.

1. Funding: lower funded status, higher PBGC costs

We expect some deterioration in funded status. The money set aside to pay benefit payments could become insufficient as annuity entitlements stretch out to match longer expected life spans. Wider funding gaps could lead to forced contributions and higher Pension Benefit Guaranty Corp. (PBGC) premiums.

Preparation strategies I

- Consult plan actuaries to determine the exact impact of the new tables on liabilities, given plan workforce age, gender and geographic distribution.
- Assess whether additional contributions will be necessary and how the plan sponsor can most efficiently accommodate them.

² The mortality table reflects current lifetime expectations. The mortality projection describes how mortality tables should be updated in coming years.

³ Society of Actuaries (2014)—RP-2014 Exposure Draft. The SOA estimates that the switch from current mortality projection scale BB to scale MP-2014 would raise liability valuations by 6%. As shown in table 5 of the RP-2014 Exposure Draft, switching from RP-2000 scale AA to the new mortality table results in a 10.5% increase in liability for a 75-year-old male, compared with a 2.8% increase in liability for a 45-year-old male.

2. Investments: longer liability duration, greater awareness of longevity risk

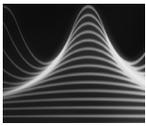
According to most estimates, pension liability duration should increase by nine months to one year with the changes in longevity assumptions, making liabilities more sensitive to interest rate changes.⁴ The greater responsiveness of liabilities to interest rates may require investing in longer-duration assets and/or using derivative overlays, such as interest rate swaps and futures. Plans de-risking through liability-driven strategies may need to extend the duration of the hedge-oriented portions of their portfolios if they want to keep their “liability hedges” constant.

The sudden increase in liabilities highlights the importance of having a portion of assets targeted toward generating excess return over the liability discount rate. Such investments, which we call growth assets, work not only to close deficits but also to cover costs and risks outside of projected benefit payments, such as mortality table updates, future salary increases and PBGC expenses.

Preparation strategies II

- Determine the updated duration of the plan’s liabilities and review implications for the hedging portfolio; a longer duration may call for re-weighting allocations toward long-dated bonds or derivatives.
- If the plan is part of a glide path program, determine whether the decrease in funded status is significant enough to justify a temporarily higher allocation to growth assets.

⁴ Aon Hewitt. “Major changes to mortality assumptions in 2014” 2014; Justin Owens. *How will the new RP-2014 mortality tables affect my DB plan strategy?* Russell Investments, 2014; Society of Actuaries (2014).



Longevity risk in the greater scheme of pension risks

Although the prospect of increased longevity risk may seem daunting to U.S. plan sponsors, from a holistic liability-driven perspective for managing pension risk, we believe for most plan sponsors longevity should rank as a lower order concern. Plans progressing on their glide path toward an end-game goal have larger risk exposures that are easier and cheaper to hedge through capital markets and offer more “bang for the buck” than longevity hedging.

J.P. Morgan’s Liability-Driven Investment Solutions Group manages risk based on a measure of one-year funded status value at risk (VaR) at the 95% percentile level of all statistically possible outcomes—in other words, the magnitude of a funded status deterioration in any single year in the event of a “least worst case” market scenario.⁵ The Group’s models and experience indicate that from the initial stage to the end-game stage of the glide path, plans steadily reduce equity and interest rate risk exposure. As the VaR from equities, interest rates and credit spreads shrinks, longevity risk takes up a correspondingly larger proportion of the plan’s risk profile and therefore rises in importance.

As a direct consequence of the increased liabilities, the new mortality assumptions will make lump-sum payouts pricier. However, buy-out and buy-in premiums (the difference between the price paid to the insurer and the stated value of liabilities in financial statements) could decrease. Transfer prices, the value of the liabilities plus the premiums, will likely remain stable as a whole, even though carrying liabilities on the plan’s books should become more expensive. Insurance companies maintain their own independent mortality tables, so their liability estimates will not be affected by the change in mortality tables published by the SOA. In effect, analysts expect premium margins to fall 5%-10% from the current range of 10% to 15%.⁶

Preparation strategies III

- Discuss with internal stakeholders whether less expensive premiums for buy-out or buy-in options could change long-term objectives for the plan.
- If there is a plan to offer lump-sum payouts at some point, consider executing the plan before the new mortality tables become effective.

3. Risk transfer strategies: pricier lump-sum payouts, lower buyout premiums

A number of plan sponsors have risk transfer strategies as future objectives. These strategies include offering lump-sum payouts to plan participants or engaging in a buy-in or buy-out transaction with an insurance company. **Exhibit 4** summarizes the characteristics of each approach. Lump-sum payouts effectively transfer longevity risk from sponsor to participants. They also remove liabilities like flat-rate PBGC premiums and administrative expenses from the balance sheet. Plans can offer lump sums at any point in the glide path if sufficient funding exists or in conjunction with broader buy-in and buy-out risk transfer transactions. Buy-ins and buy-outs are more suited to sponsors that have covered higher priority risks, such as funded status, equity, interest rate, credit and curve risks. In a buy-in, the sponsor purchases annuities from an insurer, which holds them in plan assets. A buy-out removes pension risk entirely from the sponsor’s balance sheet by transferring assets and liabilities to an insurer.

Three ways to hedge longevity risk

EXHIBIT 4: PENSION RISK TRANSFER STRATEGIES FOR MITIGATING LONGEVITY RISK

	Lump sum	Buy in	Buy out
Description	Sponsor pays lump sum amount to participants	Sponsor purchases annuities that are held in plan assets from an insurer	Sponsor removes pension risk from balance sheet by transferring assets and liabilities to an insurer
Risks hedged	Rates, spreads, longevity	Rates, spreads, longevity	Rates, spreads, longevity
Considerations	Premium, risk is removed from balance sheet	Premium, risk remains on balance sheet but can convert to a buy-out	Premium, risk is removed from balance sheet

Source: J.P. Morgan. For illustrative purposes only.

⁵ See the Liability-Driven Investment Solutions Group’s recent publication “LDI—from theory to practice.”

⁶ Justin Owens. *How will the new RP-2014 mortality tables affect my DB plan strategy?* Russell Investments, 2014.

Less capital-intensive strategies that could land on our shores in the future

Addressing longevity risk is more prevalent in the UK, where most liabilities are indexed to inflation. Inflation indexing significantly exacerbates a sponsor's longevity risk by raising the amount of each benefit payment just as longer life spans increase the number of them. Longevity hedges available in the UK seek to reduce exposures. They have taken two forms, both of which tie up less capital than the risk transfer strategies available in the U.S.:

- **Longevity insurance contract:** The plan sponsor purchases protection against longevity extending beyond a pre-defined exercise level. The insurance contract transfers the "excess" longevity risk of the plan to the insurer while the plan retains the corresponding rate and spread risks as well as the longevity risks within the contract exercise level.
- **Longevity swap:** The sponsor enters a contract to swap actual benefit payments for fixed payments. The swap contract transfers the longevity risk of covered participants to the insurer, but the plan retains the rate and spread risks.

Until these strategies become available to U.S. plans, we recommend that plan sponsors consider maintaining a sleeve in their portfolios generating returns above the growth rate of liabilities.

Continuing trend: pension smoothing

When MAP-21 was enacted in 2012, corporate pension plans took advantage of the higher liability discount rates it provided to reduce contributions. On August 8 of this year, President Obama signed the Highway and Transportation Funding Act of 2014, which extends MAP-21 for an additional 10 months and raises effective discount rates, providing additional relief to corporate pension plans.

A friendlier discount rate

Before MAP-21 became law, pension plans could choose to value their liabilities either with the spot yield curve or with the 24-month smoothed average segment rates of the Pension Protection Act of 2006. MAP-21 gave plan sponsors a third valuation alternative: the rolling 25-year average segment rates. The historical averages, which are much higher than rates

today, reduce required contributions by lowering the discounted value of pension liabilities—and boosting the funded ratio as a result. MAP-21 limits the maximum discount rate to 90% of the 25-year average.⁷ The 90% floor drops 5% per year through 2016, to 85%, then 80%, gradually reducing the advantage of discounting by the 25-year average. HATFA-14 extends the amount of time plan sponsors can take advantage of the relief to 2017, and the annual 5% reductions from three years to five, ending in 2021.

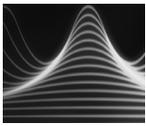
Exhibit 5 (next page) compares interest rate projections for MAP-21 floor, HATFA-14 and spot rates, based on simulations using J.P. Morgan's 2014 Long-term Capital Market Return Assumptions—the LTCMRA.⁸ In early years, the MAP-21 and HATFA-14 rate floors are a good deal higher than the median spot yield in our simulations—and higher than the 25th percentile result, so they afford considerable short-term contribution relief. The interest rate-smoothing benefits of the two laws fade further in the future, as bond yields rise (according to the LTCMRA) and the HATFA-14 and MAP-21 rate floors fall. The spot rate in our median scenario converges with the MAP-21 floor by mid-2016 and the HATFA-14 floor by the end of 2017, rendering funding relief moot.

Why pension matters for government funding: the pension "cookie jar"

As a consequence of reducing required contributions, pension relief policies such as MAP-21 and HATFA-14, provide a source of revenue to finance federal spending. If sponsors contribute less to their pension plans, their taxable net income will be higher, generating higher tax revenues for government. HATFA-14 expires in May 2015. Because the Highway Trust Fund stands a good chance of running out of money next year, further HATFA-14 revisions and extensions seem likely. Plan sponsors should thus prepare to reassess their strategy in managing taxes and contributions.

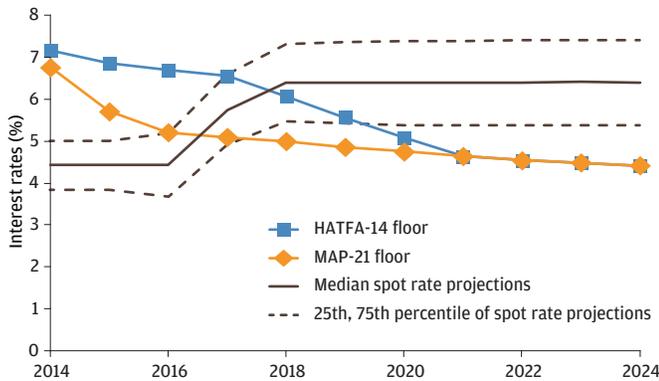
⁷ In fact, MAP-21 sets a 10% "corridor" around the average. If the spot yield is more than 10% below its 25-year average, the plan sponsor can discount liabilities at no less than 90% of the average. The "floor" is actually the lower bound of a 10% corridor. Theoretically, if spot yields rose above the average, plan sponsors could discount liabilities up to 110% of the average—a highly improbable circumstance since sponsors would have no incentive to use the average if spot yields provided a more favorable discount rate.

⁸ The IRS divides the corporate bond yield curve used to discount pension liabilities into three segments based on maturity. For our comparison, we are using the third segment of the yield curve.



Statutory discount rate relief is substantial over the next several years

EXHIBIT 5: 10-YR SPOT RATE PROJECTION, MAP-21 VS HATFA-14



Source: 2014 J.P. Morgan Long Term Capital Market Return Assumptions, Internal Revenue Service. For illustrative purposes only.

Interest rates were simulated 10,000 times, based on 2014 J.P. Morgan Long Term Capital Market Return Assumptions (adjusted to reflect current market rates). The 25-year average rates were estimated assuming that the 25-year average rates decrease over time. The rates depicted here are the 30-year rate (Tier-3 Segment Rate), covering liabilities 20 or more years away.

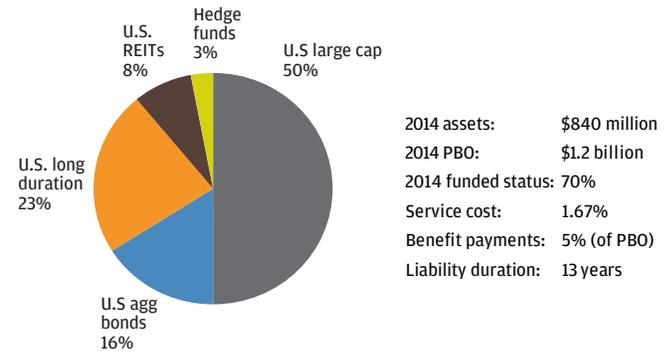
Implications for a hypothetical DB plan

To gain greater insight into the implications of HATFA-14, we projected the funding ratios and required contributions under 10,000 forward-looking asset return scenarios for a hypothetical defined benefit pension plan, based on our Russell 3000 database. Our hypothetical plan has 80,000 participants, and a standard liability stream, and makes only minimum contributions as required by regulations (Exhibit 6).

We consider three different starting funding levels: a critically underfunded plan (70% funded), a median funded plan (88%) and a fully funded plan (100%). We start by analyzing a plan that is 70% funded, as the sizable underfunding highlights important findings, which are also valid for better funded plans, although to a lesser degree. For each case, we value pension liabilities using three alternative rates: the spot corporate bond yield curve (“pre-MAP-21”), the MAP-21 floor and the HATFA-14 floor. Our objective is to compare contributions and funded status trajectories under the different discount rates.

Under HATFA-14, the model plan benefits from a higher liability discount rate and the correspondingly lower present value of its liabilities. As a consequence, the critically underfunded plan in the HATFA-14 scenario is fully funded in the early years, even though it falls short under either the pre-MAP-21 or MAP-21

EXHIBIT 6: PLAN MODEL BASED ON RUSSELL 3000 DATABASE



2014 assets:	\$840 million
2014 PBO:	\$1.2 billion
2014 funded status:	70%
Service cost:	1.67%
Benefit payments:	5% (of PBO)
Liability duration:	13 years

Source: J.P. Morgan. For illustrative purposes only.

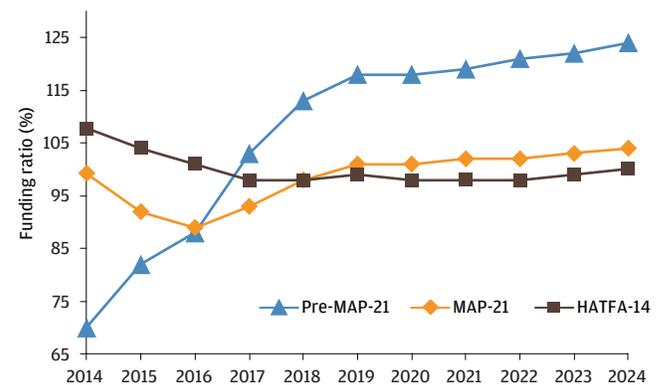
Asset allocation is based on the 2013 Russell 3000 company 10-Ks and data from Bloomberg.

scenarios (Exhibit 7). Under MAP-21, the plan enjoys a higher statutory discount rate than pre-MAP-21 at the outset, which explains its superior funded status, but its rate is not as elevated as it is under HATFA-14, which explains why its funded status is inferior to the HATFA-14 scenario.

By 2016 in the pre-MAP-21 scenario, funded status catches up to MAP-21 and to HATFA-14 by 2017. It does so primarily thanks to high required contributions early in the analysis (Exhibit 8, next page) but also because of the rising interest rates we anticipate.⁹ By 2024, pre-MAP-21 funded status is significantly over 100%.

If interest rates normalize, even underfunded plans should be fully funded in 10 years, thanks to statutory pension relief

EXHIBIT 7: IMPACT ON PPA FUNDED STATUS



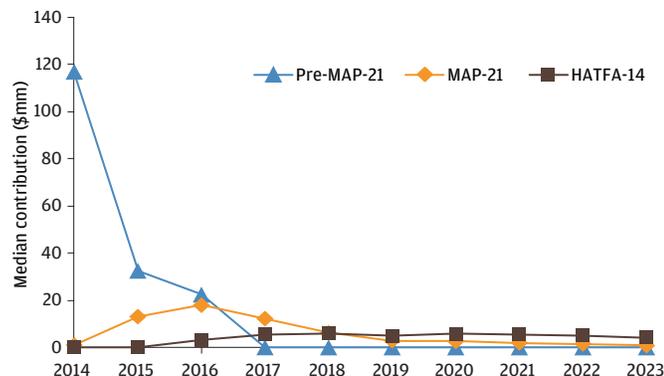
Source: J.P. Morgan’s 2014 Long-term Capital Market Return Assumptions. For illustrative purposes only.

Funded status, as calculated according to the provisions of the Pension Protection Act of 2006, determines required contribution and PBGC insurance premiums.

⁹ The high level of contributions in the two underfunded scenarios, a consequence of the current extremely accommodative interest rate environment, would, of course, be much lower in historically more normal circumstances. A rate-smoothing mechanism would have reduced these high early-year contributions, which rate normalization in later years would have made unnecessary anyway.

Under MAP-21, an underfunded plan in our median returns scenario has few contributions to make in the early years

EXHIBIT 8: IMPACT ON MEDIAN CONTRIBUTION*

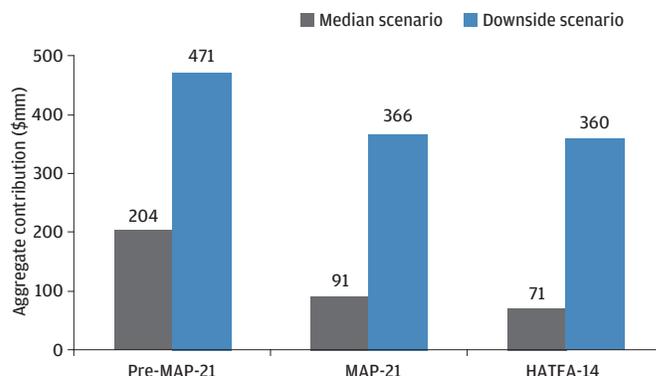


Source: J.P. Morgan. For illustrative purposes only.

*Median contribution is the most likely value of contributions the plan is going to make each year, given forward-looking assumptions. It is defined as the median of the present value of projected future contributions.

With median returns—or even “worst case” projections—an underfunded plan ends up contributing much less under HATFA-14

EXHIBIT 9: AGGREGATE CONTRIBUTION*



Source: J.P. Morgan. For illustrative purposes only.

*Downside contribution is the worst-case contribution risk, defined as Conditional Value at Risk of present value of projected future contributions at the 95th percentile. Aggregate values are the sum of present values of projected future contributions over 10 years.

More significant than the relatively minor differences in end period funded status is the large difference in aggregate required contributions over the decade (**Exhibit 9**). Thanks to interest rate smoothing, the model in the HATFA-14 scenario calls for only a third of the required contribution over the next 10 years than does the pre-MAP-21 scenario and some 22% less than under MAP-21. Even in a worst-case situation (investment returns ranking in the bottom 5% of our Monte Carlo simulations), contributions under the HATFA-14 provisions would be 24% less than pre-MAP-21 contributions.

Our modeling exercise sheds light on an important point for pension analysts, plan sponsors and policymakers alike. Contrary to the consensus, the cases analyzed show that interest-smoothing mechanisms of MAP-21 and HATFA-14, by propping up discount rates when market rates are abnormally low, don't simply defer contributions to some point in the future—they make it possible to avoid them altogether. The current low interest rates are likely to require minimum contributions, but a return to anything approaching historical market rates will by itself go a long way toward closing funding gaps.

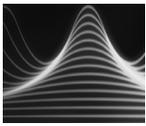
According to our projections, forcing contributions, a “temptation in the current cheap-money, easy-credit environment,” can have adverse consequences if and when rising rates

return. It could lead to a funded surplus, trapping assets in the plan. Under the median pre-MAP-21 scenario, our initially underfunded plan ends overfunded by 20%. That's not one of those good-to-have problems, as CFOs know well, because the requirements to revert a pension surplus to the plan sponsor are very stringent.

Replicating the analysis under two other funding levels—the Russell 3000 2013 median funded status of 88% and, on an accounting basis, a fully funded plan—we found that the patterns established for our initial assumptions apply, although to a lesser degree:

- Starting at 88% funded, the MAP-21 and HATFA-14 provisions imply no required contributions in the median asset return scenario, while under pre-MAP 21, the plan would have to contribute \$61 million over 10 years.
- Starting at fully funded, the model plan makes zero contributions in the median scenario under all three discount rate rules.

So the main conclusions drawn for the critically underfunded plan apply at different funding levels. The contribution relief provided in MAP-21 and HATFA-14 makes it possible to avoid contributions altogether as market rates revert to historical norms.



Blending the two effects: increasing longevity and pension relief

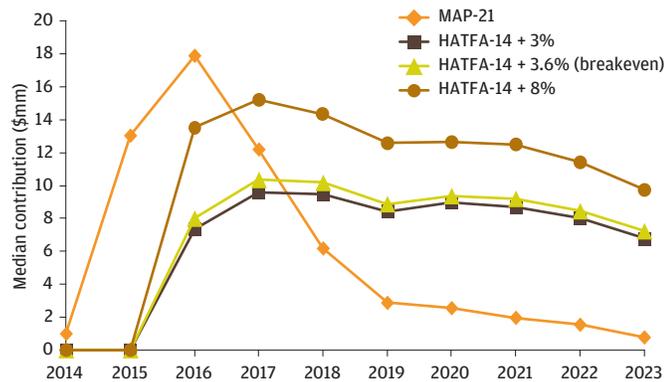
Analyzing the good news, HATFA-14 pension relief, in the 2014 good news/bad news pension story affords some perspective on the bad news, the upcoming revision of the SOA mortality tables. The revision will increase plan liabilities across the board, to be sure, but could it wipe out the gains from the HATFA-14? To answer the question, we baked the updated mortality assumptions into our plan models, beginning in 2016. Starting with the “worst-case” 70% funded plan, we considered increases in the present value of liabilities ranging from 3% to 8%, in line with the range of estimates from the leading actuarial firms and the SOA.¹⁰

Using the assumptions laid out in the last section, the plan reaches fully funded status under the HATFA-14 provisions before the implementation of the new mortality tables in 2016, so it does not have to make contributions in 2014 and 2015 (Exhibit 10). By 2016, when the new mortality tables take effect, contributions spike but still do not reach the level of contributions under MAP-21—so the longevity increase does not fully cancel out the interest rate relief from HATFA-14. By 2019, contributions under all scenarios gradually wind down. By 2023, contributions under the MAP-21 scenario fall away completely.

With further modeling, we found that the break-even point for increased liabilities in the median scenarios was 3.6%

The breakeven for the increase in plan liabilities under the new mortality tables and HATFA-14 pension relief is 3.6% for our underfunded plan. Above that increase, the plan will have to contribute more

EXHIBIT 10: IMPACT OF HATFA-14 AND MORTALITY ASSUMPTIONS ON MEDIAN CONTRIBUTION



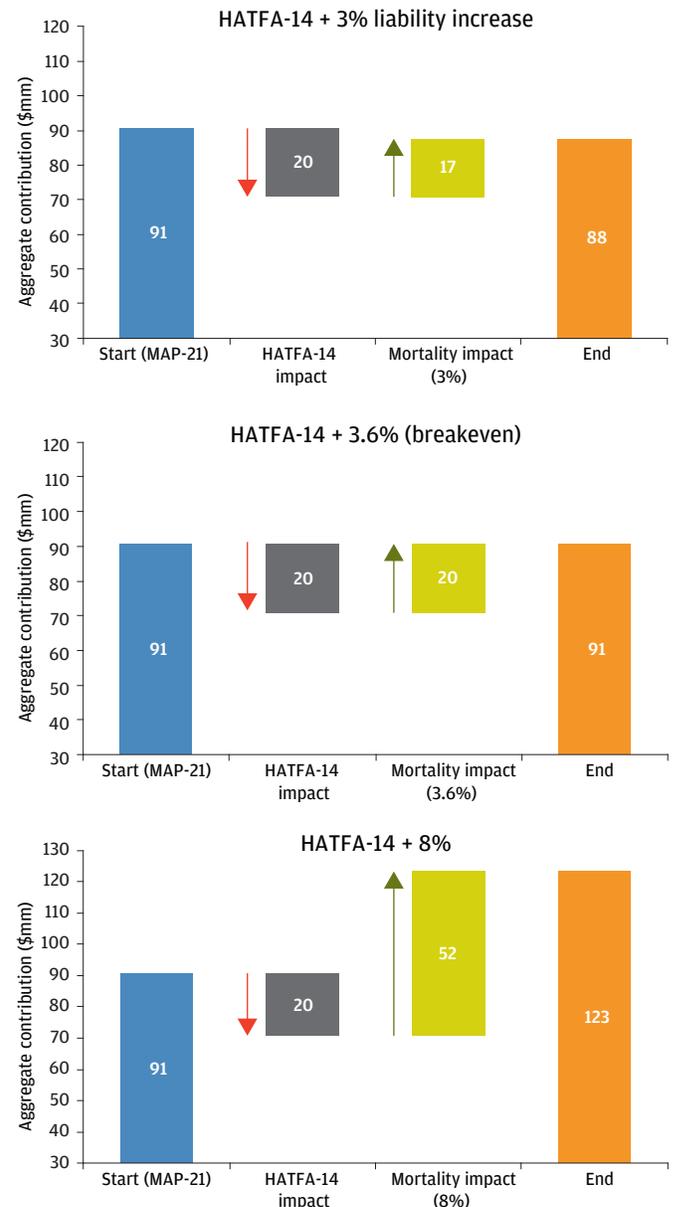
Source: J.P. Morgan. For illustrative purposes only.

¹⁰ Aon Hewitt, Russell Investments.

(Exhibit 11). With a 3.6% increase in the model plan’s liabilities, reflecting the updated longevity assumptions, the gain from HATFA-14 pension relief just offsets the increase in minimum contributions that the revised tables might require. Below 3.6%,

Mortality updates and HATFA-14 offset under different liability increase assumptions

EXHIBIT 11: CONTRIBUTION IMPACT OF HATFA-14 AND MORTALITY ASSUMPTIONS



Source: J.P. Morgan; data as of 2014. For illustrative purposes only.

HATFA-14 + 3%, HATFA-14 + 3.6% and HATFA-14 + 8% scenarios reflect the impact of HATFA-14 and percentage increase in the present value of plan liabilities of 3%, 3.6% and 8%, respectively.

HATFA's contribution relief offsets the increase in liabilities occasioned by the new mortality tables. By contrast, when faced with liability growth in excess of 3.6%, plans should prepare for greater required contributions than under current MAP-21 regulations.

For plans at the 2013 median funded level and above, our calculations show that the change in the mortality tables does not wipe out funding surpluses under either MAP-21 or HATFA-14. At a funded status of 88% or higher, our model plan does not have to make additional contributions under HATFA-14 even accounting for the new mortality tables. This does not imply that managers of well funded plans can simply disregard the longevity changes. Even though the revised mortality tables does not affect Pension Protection Act contributions, it may still impact funded status calculations for accounting purposes and PBGC insurance premiums.

Landmark pension research (second in a series)¹¹

In this issue, we investigate Fischer Black's 1980 pension tax arbitrage model.¹² According to Black, pensions cannot fully capitalize on their special tax status by investing in common stocks. Corporations can reduce taxes without reducing the expected return potential of the overall pension portfolio or requiring additional contributions in a two-step portfolio shift:

- 1) Issue bonds, the interest on which is tax deductible, and use the proceeds to buy back the firm's shares, thereby reducing corporate dividend payments, which are not tax deductible.
- 2) Shift pension assets from equities to fixed income, the interest on which is tax exempt.

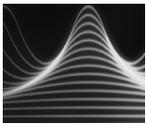
These steps are equivalent in essence to 1) selling the pension plan's stocks and investing in the firm's own stock; and 2) borrowing by the firm to finance tax-free lending by the pension fund. The firm gains when there exists a spread between the pre-tax interest rate and the effective after-tax rate, and when the firm's stocks perform as well as the equities in the pension fund. These transactions would then generate a tax savings without affecting financial risk because the return on fixed income investment held in the pension plan is tax-exempt.

Black's arbitrage tacitly assumes risk neutrality. The risk reduction achieved by shifting pension assets from equities to bonds offsets the risk associated with higher company leverage. This is not always true. The bonds the corporation issues and the bonds the plan buys can differ widely in their underlying ratings, liquidity and risk exposures. Black further assumes that investing in the firm's stock would be just as good as an investment in equities through the pension fund.

Black's arbitrage scheme may well improve overall corporate after-tax returns if all his assumptions hold, but we question whether tax incentives alone should determine pension plan asset allocation strategy. Any plan sponsor weighing changes in asset allocation should probably consider additional factors. Critically important variables—such as pension funding status, financial liquidity, broad market risk, the firm's default risk, its marginal tax rate and sponsor incentives to justify the choice of pension accounting assumptions—and maintain financial liquidity—should enter into the allocation decision.

¹¹ In the previous edition of *Pension Pulse*, we examined the link between pension plan risk and a plan sponsor's balance sheet highlighted in the classic paper by Robert Merton, Li Jin and Zvi Bodie, "Do a firm's equity returns reflect the risk of its pension plan?" *The Journal of Financial Economics*, 81 (2006); pages 1-26.

¹² Black, Fischer. "The tax consequences of long-run pension policy," *Financial Analysts Journal* 36, no. 4 (July/August 1980): 21-28.



Funded status outlook from global markets strategist Michael Hood

Bond yields have fallen sharply in 2014, a recent uptick notwithstanding. The 10-year U.S. Treasury yield has dropped roughly 50 bps since the end of 2013. Although surprisingly weak economic growth—including a shocking decline in U.S. GDP during the first quarter of the year—has likely played a role in this rally, short-term rates have actually risen, and market expectations for the timing of Federal Reserve tightening have not shifted significantly. Most of the action in Treasuries has thus occurred at the long end of the curve. Two factors likely explain much of it. First, market participants appear to have reduced their forecasts for the U.S. economy's potential growth rate beyond the next few years. Views about the terminal fed funds rate and equilibrium bond yields have correspondingly shifted lower. Second, a shift toward dovishness among other major central banks, most notably the European Central Bank, has produced sharp falls in international bond yields. That decline seems to have exercised a gravitational pull on Treasury yields as well.

Even though we share the view that U.S. bond yields will not return to historical norms because of slower trend growth, we think that the medium-term equilibrium lies somewhat above current market pricing for long-dated forwards (the 10y5y, for example, currently stands at 3.63%, compared with our expectation of 4.00%-4.25%). We expect Fed rate hikes to begin around the middle of 2015, with some risk that tightening will proceed somewhat faster than consensus projects. We therefore retain our forecast for a steady upward drift in bond yields, although the change in the international rate environment means that this rise will likely occur more gradually than previously thought. The 10-year yield now seems likely to end 2014 a little below 3.00%, reaching the 4.00% mark only by late 2016 or early 2017.

Although the U.S. expansion has passed its five-year point, recession risk in the next year or two still seems low. The economy appears to be operating with significant slack, and imbalances have not yet accumulated in the financial system. Equity markets have continued to climb in 2014. In the U.S., this year's gain owes almost entirely to rising earnings expectations, in contrast with the 2013 jump in valuations. Our forecast for steady U.S. real GDP growth at a 2.75%-3.00% pace during the next two years should translate into corporate

earnings increases at a mid-single-digit clip, with persistent labor market slack allowing firms to protect high profit margins for the time being. Equity valuations look broadly similar to previous mid-cycle levels (the mid-1990s and the mid-2000s, in particular) and do not seem to suggest elevated risk of a significant and lasting correction in prices. In the postwar era, such downturns have occurred extremely rarely outside of recessions.

Whereas U.S. equity markets tend to drift higher until the very end of expansions, credit spreads typically trough earlier in the business cycle, with a shift in corporate behavior toward more-shareholder-friendly action, producing an inflection point for spreads. Investment grade corporate bond spreads are nearing the lows observed during previous cycles and thus are apparently approaching their bottom for the current expansion. The swing in corporate activity appears to be under way, typified by the increase in merger announcements. Credit spread compression will likely provide a very limited offset to the gradual increase in risk-free rates over the next few years, resulting in higher all-in corporate bond yields.

Implied and realized market volatility has fallen in 2014 despite rising geopolitical concerns. To some extent, this market calm reflects the economy's business cycle position, with volatility not far from levels observed during the mid-1990s and mid-2000s. At the same time, low market volatility likely reflects moderate economic fluctuations, with growth sluggish but quite stable by historical standards. The standard deviation of monthly U.S. payroll increases, for example, has dropped to a record low. Something similar has happened to oil prices, thanks to the loosening of supply constraints, thus denying geopolitical risk its usual transmission mechanism into the economy and markets. Though volatility will likely rise somewhat as the Fed begins to tighten, its low current levels look broadly appropriate for today's prevailing conditions rather than a sign of unhealthy complacency.

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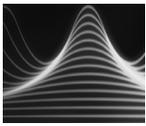
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