

Funding Relief and Implications for Pension Investing

Introduction

On July 6, 2012 President Obama signed into law the Moving Ahead for Progress in the 21st Century Act ("MAP-21"). With irony perhaps fitting only to an act of Congress, the bill entitled "Moving Ahead for Progress..." provides for contribution relief by allowing pension plans to discount their liabilities based on a 25-year *historical* average rate, in effect discounting at higher than current market rates.

Given these higher discount rates and the reality that these statutory rates are unlikely to track market rates for the next few years, it is natural to question whether liability driven investment ("LDI") strategies should be adjusted. In particular, does this change present an opportunity for plans to lower the interest rate sensitivity of their asset allocation? This paper examines whether the underlying economics of pension plans have changed due to this law - they haven't - and whether a change in the assets' interest rate sensitivity will materially affect expected contributions - only modestly.

As always, decisions on whether to increase or decrease assets' duration can be made in the context of any tactical views on the direction of rates, but this change in law should not be, in and of itself, a significant reason for changing the underlying strategy.

MAP-21

The primary goal of MAP-21 is to immediately reduce the amount of near-term contributions plan sponsors are required to make to underfunded pension plans. Rather than simply provide a waiver on contributions - an output based approach - MAP-21 changes the inputs - the discount rate used to value the liability - to achieve roughly the same result. An unfortunate side effect of choosing the input approach is that it obscures the economic realities of a plan.

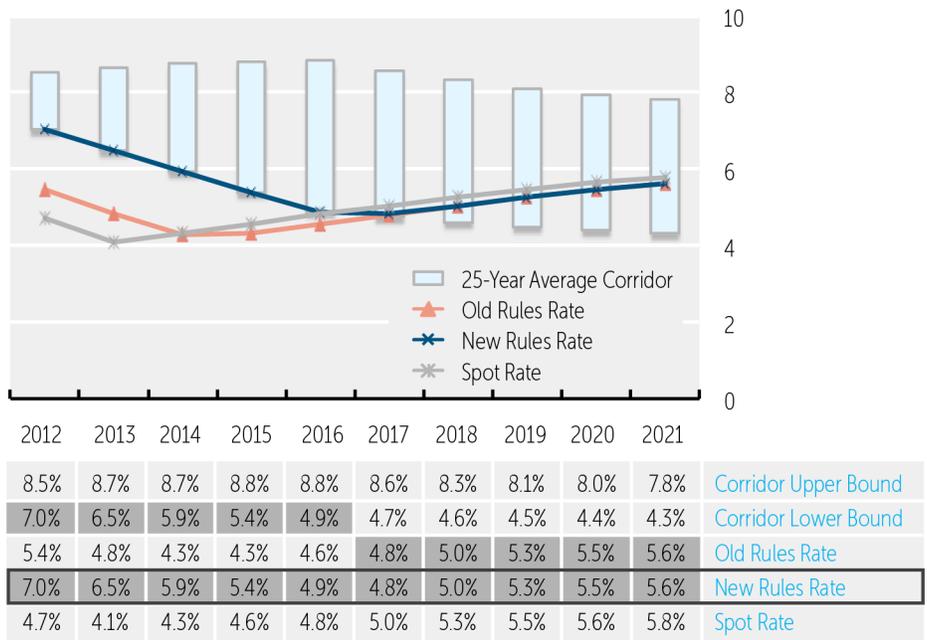
Although MAP-21 is permanent legislation, its effects may only be relevant for the next few years. MAP-21 establishes a minimum and maximum corridor for the 24-month average segment rates used in discounting liabilities. The corridor rate band is based on a 25-year average of the segment rates. In 2012, the corridor is +/- 10% of the 25-year average rate. For example, if the 25-year average rate is 7.0%, the discount rate used can be no lower than 6.3% or no greater than 7.7%. The corridor then widens as follows: 2013 = 15%, 2014 = 20%, 2015 = 25%, 2016 and beyond = 30%. As the corridor widens over the next several years it becomes less relevant.

The two-year rolling average rate, as currently calculated under PPA, is compared to the minimum/maximum rates from the corridor. If the two-year rate is within the corridor, that rate is used; however if it is outside the corridor, then the appropriate minimum or maximum corridor rate is used.

Exhibit I below shows the discount rate for an illustrative 14-year duration liability based on projected segment rates assuming market rates as of 7/31/12 and following the break-even Treasury curve thereafter (corporate spreads are assumed to remain constant)¹.

¹ For more information see NISA white paper titled "The Break-even Yield Curve".

Exhibit I: Projected Discount Rates, %



Data Sources: IRS Notice 2012-55, Citigroup, Barclays, NISA calculations

By the year 2016, the corridor has less impact and unless rates decrease, the discount rate as calculated under prior PPA law would be used for funding purposes starting in 2017. It should also be noted that if rates were to materially increase from current levels, the corridor could require a lower discount rate and hence a larger liability valuation.

Plans that previously elected to estimate the discount rate using the PPA spot curve rather than the two-year rolling average rate will have the option of making a one-time election to switch back and use the two-year rolling average rate with the 25-year average corridor.

The Economics are Unchanged

While MAP-21 may allow plans to use lower liability values when determining required contributions, it does not change the underlying economics of the pension plan. Therefore, it does not change the economic reasoning for LDI-based strategies.

MAP-21 does not change the underlying annuity cash flows payable to participants. Additionally, the Act intentionally left lump sum payments unchanged, meaning that the value paid to participants that choose a lump sum is unchanged and is still based on prevailing spot PPA rates. Put another way, if all participants in a plan were to take an immediate lump sum, the value they would extract would be the same as it was prior to the passing of MAP-21.

GAAP pension funding measures remain unchanged as well. Liabilities reported on the balance sheet will still be calculated based on a market-based AA quality discount rate, and assets will still be reported at market value. Moreover, external credit analysts will continue to factor marked-to-market pension funded status and pension risk into their view of a company's credit worthiness. In short, nothing has changed for a firm's stakeholders.

Recent Illustration

The recent pension buyout by Prudential of a portion of General Motors' ("GM's") liability further highlights that the economics of the liability are inescapable. In the first step of this process, GM is offering its participants lump sums based on the spot PPA rate. Benefits associated with participants that do not accept the lump sum buyout will become the

responsibility of Prudential along with assets deemed necessary (by both parties) to satisfy the benefit payments.

The discount rate implied by the price that GM is paying to Prudential to assume responsibility has not been disclosed. Based on GM press releases and statements, the discount rate is likely to be somewhere between Treasury rates and PPA spot rates². If the buy-out rate was above PPA spot rates (i.e. GM could pay less because of a lower liability value), then GM would likely forgo offering lump sums as it would have been cheaper to sell to Prudential than to pay out plan participants directly. If the discount rate was below Treasury rates, GM could have maintained a Treasury defeasance portfolio within the plan at a lower cost. Prevailing market levels of Treasury and high quality corporate yields provide logical book ends for estimating the economic realities of the plan.

The Impact on Contributions

While the economics of pension liabilities are inescapable, we understand that many plans may consider using contribution requirements, particularly contributions for the next few years, as a measure of pension health and pension risk. For those plans, it is natural to wonder if MAP-21 justifies a change in asset allocation. In particular, given that the liability discount rate is largely insensitive to changes in market rates for the next few years, does lowering the duration of the fixed income allocation make sense?

We examined this issue through Monte Carlo simulation³ by estimating expected contributions for an illustrative plan for the next 10 years assuming various fixed income allocations. Key assumptions in the analysis include⁴:

- The plan liability has a present value of \$1 billion and duration of 14 years when discounted at the PPA spot curve as of 07/31/2012.
- The plan is 75% funded (assets = \$750mm), with 60% in global equities and 40% in long duration credit fixed income.
- The equity and fixed allocations are static (i.e. they are rebalanced to 60/40 annually).
- Long-term fixed income is assumed to have a -0.25% term premium and simulated interest rates are centered on rates consistent with the same term premium.

The three illustrative allocations are outlined in Exhibit II:

Exhibit II: Allocations Modeled

	Baseline	No Duration	Extra Long Duration	
Equity Allocation (Global)	\$450mm	\$450mm	\$450mm	
Fixed Income Allocation (Long Duration Credit)	\$300mm	\$300mm	\$300mm	
Interest Rate Derivatives	None	Short synthetic Treasuries positions to remove general rate exposure (-\$300mm)	Long synthetic Treasuries positions to increase liability hedge (+\$450mm)	
Resulting Liability Hedge	Initial	30% hedge vs. general rates 30% hedge vs. spreads	0% hedge vs. general rates 30% hedge vs. spreads	75% hedge vs. general rates 30% hedge vs. spreads
	Over Projection Horizon	General rates and spreads hedge will vary as funded status changes	General rates hedge will always be zero, spreads hedge will vary with funded status	General rates hedge will always equal funded status, spreads hedge will vary with funded status

² NISA applied reasonable assumptions to publically available information related to the transaction for the purpose of this discussion.

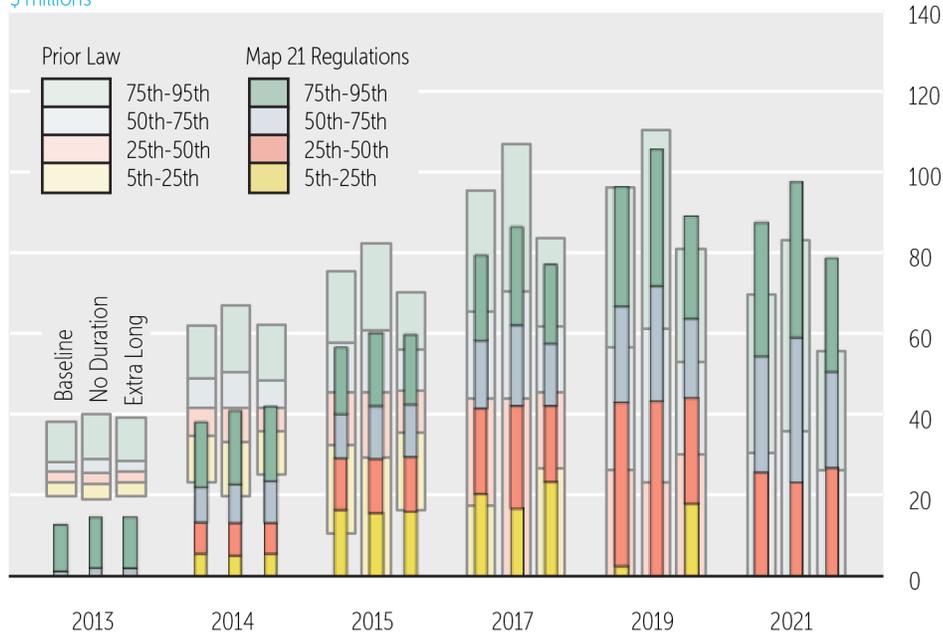
³ Simulated capital market projections used in Monte Carlo analysis are based on data from Bloomberg, Barclays, IRS, and NISA calculations.

⁴ Please see Appendix for additional assumptions.

Exhibit III below compares annual required contributions starting in 2013 at the 5th, 25th, 50th, 75th and 95th percentiles under the new MAP-21 regulations as well as the prior law based on the illustrative asset allocations detailed above.

Exhibit III: Required Annual Contributions

\$ millions



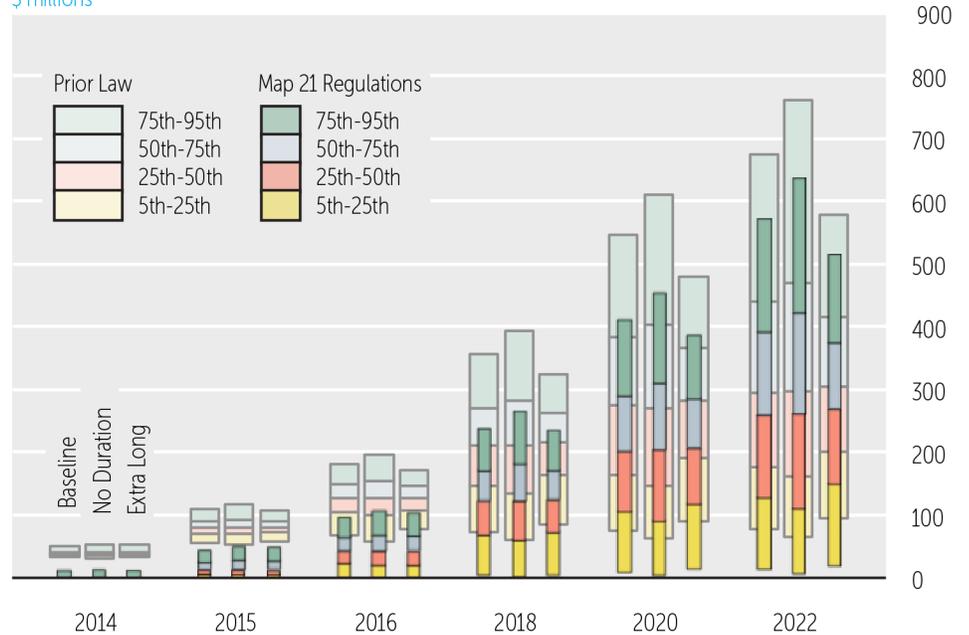
Conclusions from Exhibit III:

- When comparing the MAP-21 rules with the previous rules, expected required contributions are materially lower in years 2012 – 2015, are roughly the same from 2016 – 2018, and are higher thereafter. The economics of pension liabilities are inescapable and MAP-21 essentially pushes expected required contributions from 2012- 2015 to 2019 and beyond.
- While the volatility of contributions is little changed over the horizon, there is a modest reduction of volatility over the first few years.
- The duration of the fixed income allocation did not have a material impact on the volatility of contributions in the next few years. The benefits of lengthening duration are scant for the first few years, at times modestly increasing funded status volatility. The negative correlation between equities and rates (consistent with empirical data for the past 10+ years) helps to prevent material increase in contribution volatility when the long duration strategies are employed. In later years, as the MAP-21 corridor is less likely to have an impact, long duration fixed income again reduces contribution volatility materially.

Exhibit IV below compares cumulative required contributions starting in 2014 with and without the MAP-21 regulations.

Exhibit IV: Cumulative Required Contributions

\$ millions

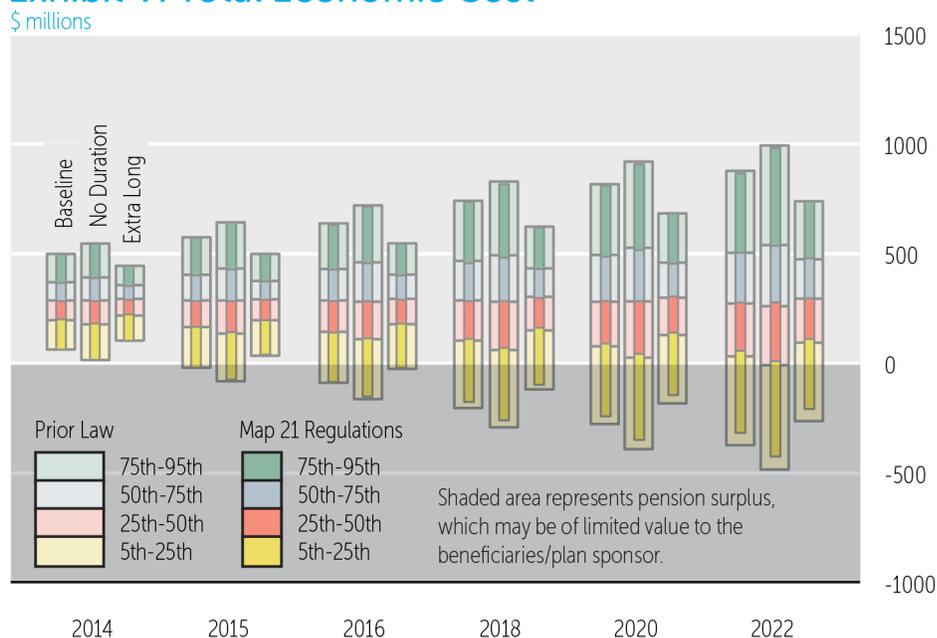


Conclusions from Exhibit IV:

- Even under the new MAP-21 regulations, when looking at the present value of cumulative contributions over five and especially ten years, the long duration fixed income allocation results in lower volatility. As time passes and the corridor built into MAP-21 becomes larger, the economics eventually catch up.
- The magnitude of the improvement in contribution volatility (single year or cumulative) from an increase in duration is higher under the old rules. MAP-21 undoubtedly mutes some of the improvement in contribution volatility from an LDI strategy. For plans "on-the-fence" regarding LDI, this may be enough to slow their implementation of LDI strategies or execute partial implementations.

Exhibit V below compares cumulative required contributions plus the ending funded status based on the spot PPA curve starting in 2014 with and without the MAP-21 regulations. This can be considered an economic measure of the plan's cost, regardless of whether under MAP-21 or old rules.

Exhibit V: Total Economic Cost



Conclusions from Exhibit V:

- A long duration strategy decreases the funded status volatility as time increases. When we augment the MAP-21 contribution rules with a more economic marked-to-market liability at the end of the horizon, the merits of long duration strategies, not surprisingly, remain very similar to the merits prior to MAP-21.
- The regulatory change has very little impact on the economic cost of the plan.

Conclusions on the Impact of Contributions:

- MAP-21 reduces the absolute level of near-term required contributions, however those contributions will likely need to be made up in the following years.
- The volatility of contributions in the near term is largely unaffected by the duration of the fixed income allocation. Over longer time horizons, single year and cumulative contribution volatility is lower in long duration fixed income strategies.
- No matter the horizon, the volatility of the total economic cost is lower in long duration fixed income strategies.

Reducing Duration, if Desired

While the underlying economics of LDI strategies are unchanged under MAP-21, and shortening duration does not materially improve contribution volatility over the next few years, it is understandable that in the current rate environment some plans may wish to express tactical views on the direction of interest rates. For those plans, MAP-21 provides protection against higher contributions over the next two-three years if their tactical view is incorrect. However, the underlying economics will eventually prevail and contributions in future years will undoubtedly be larger if duration is reduced and that rate view proves incorrect.

For plans that are considering implementing a tactical view on rates, strategies that don't disrupt the existing fixed income allocation are likely preferable to strategies that require benchmark changes, particularly if credit bonds need to be sold. Using derivatives to tactically reduce duration, rather than physical securities, can have several advantages, including lower transaction costs, quicker tactical adjustments, and a clean accounting of the performance differences from tactical decisions. Additionally, swaptions can be utilized to implement non-linear interest rate exposure profiles⁵.

NISA's white paper, "Corporate Bond Scarcity - The Case for Separating Interest Rate and Spread Risks" provides more detail on strategies that seek to obtain or keep a low duration for tactical reasons while maintaining or obtaining the strategic LDI fixed income allocation.

Conclusion

Making interest rate hedge decisions based on a smoothed rate is analogous to buying or selling equities based on a smoothed equity valuation. If Congress had instead allowed plans to use an average of historical equity prices to value pension assets, clearly a plan would not choose to sell equity if the market value were higher than the smoothed value, nor buy if the current value were lower than the smoothed value.

With this analogy in mind, we believe LDI strategies remain effective at reducing risks associated with pension funds, even in spite of views/concerns that rates might increase. There is often room for tactical views regarding interest rates in pension funds. These views should, as always, be calibrated similar to other active asset allocation bets within the plan and with a recognition that, irrespective of accounting or funding roles, the plan bears the economic risk associated with the exposure in addition to the gain if the view proves correct.

⁵ *The use of derivatives introduces additional requirements and risks to the portfolio.*

Appendix

Additional assumptions in the Impact on Contributions analysis include:

- The plan is assumed to be frozen with no new benefit accruals.
- The plan is assumed to smooth assets over two years and the current market value of the assets is the same as the smoothed assets (i.e. it is in the middle of the 90/110 corridor).
- The plan is assumed to have no prior year contribution requirements. While this assumption may not be reality for most plans that are currently 75% funded, the assumption should not affect the relative size of the contributions for the various fixed income allocations.
- MSCI ACWI data are from Bloomberg. The equity allocation is assumed to have a 3% risk premium and annual volatility of 20%.
- While the equity and fixed allocations are static (i.e. they are rebalanced to 60/40 annually), a dynamic asset allocation strategy that shifts to additional fixed income when economic funded status increases could provide a more favorable contribution profile. Please see NISA's white paper "*An Introduction to Dynamic Liability Driven Investing for Defined Benefit Pension Plans*" for more detail on dynamic asset allocation strategies.
- Liability and fixed income data are from Barclays and the IRS. Liability and fixed income volatilities are based on implied 10-year swaption volatilities where appropriate. For some fixed income instruments, volatilities are estimated using five years of historical data to calibrate their volatility relative to swaption implied volatility. Corporate bonds are assumed to have a starting OAS of 206 bps and are assumed to earn half of the OAS.
- Correlations between equity and fixed income are based on 5 years of data ending 7/31/2012.

Selected NISA Papers

Our papers can be found on the Library section of our website at www.nisa.com/library.

- *PSRX Overview and PSRX Guide* (September 2012)
- *Corporate Bond Scarcity? The Case for Separating Interest Rate and Spread Risks* (August 2012)
- *Prospective Funded Status Volatility* (October 2011)
- *Break-even Yield Curve* (August 2011)
- *Dynamic Liability Driven Investing* (July 2011)
- *Interest Rate Hedges* (May 2009)
- *Considerations Surrounding Corporate Bonds in Pensions* (December 2008)

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