Managing Pension Risk

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Discussion Topics

1. The Current Environment

- 2. Assessing Your Plan's Health
- 3. Reducing Investment Risk
- 4. Strengthening Your Funding Policy
- 5. Alternative Plan Designs



PPA/MPRA Zone Status Rules

Status / Zone	Criteria
"Green Zone"	None of the below: above 80% funded <u>and</u> no funding deficiency projected for next 7 years
Endangered	Not in critical status; below 80% funded and/or funding deficiency projected in next 7 years
Critical	Funding deficiency projected in next 4 or 5 years
Critical and Declining	In critical status <u>and</u> projected to become insolvent (i.e., run out of money) in next 15 or 20 years

PPA" = Pension Protection Act; first effective in 2008 "MPRA" = Multiemployer Pension Reform Act; first effective in 2015 Above rules are simplified; exceptions may apply



For Perspective: Zone Status by Industry

Plans Total Plans Green Zone Endangered	All Industries 1,231 Plans 63% 13%	Construction 751 Plans 67% 16%	Service 92 Plans 68% 4%	Retail/Food 63 Plans 44% 10%	Transportation 175 Plans 53% 8%	Manufacturing 103 Plans 46% 4%	Entertainment 47 Plans 72% 17%
Critical	15%	13%	21%	35%	18%	12%	4%
Declining	10%	4%	7%	11%	21%	39%	6%
Participants	All Industries	Construction	Service	Retail/Food	Transportation	Manufacturing	Entertainment
Total Participants	10.9 Million	4.2 Million	1.9 Million	1.7 Million	1.7 Million	1.0 Million	0.4 Million
Green Zone	57%	65%	56%	48%	53%	44%	82%
Endangered	11%	25%	1%	3%	6%	0%	5%
Critical	19%	9%	40%	41%	6%	4%	13%
Declining	13%	1%	3%	8%	36%	52%	0%

Percentages may not add to 100% due to rounding.

For simplicity, certain industries and trades are grouped as follows:

- Transportation includes trucking and freight, warehouse workers, bakery drivers, and maritime
- Manufacturing includes bakery workers, printing, energy, mining, and agriculture
- Service includes hospitality, healthcare, education, and communications

Source: Segal Consulting analysis of Form 5500 data for plan years ending in 2017. Zone status applies to plan years ending in 2018.



For Perspective: Distribution of Plans



Plan Count: 1,231 | Total Participants: 10.9 Million

Source: Segal Consulting analysis of Form 5500 data for plan years ending in 2017. Zone status applies to plan years ending in 2018. The size of each "bubble" is based on the total number of participants covered by the plan.



Inactive/Active Participant Ratio vs. Zone Status



- Source: Segal analysis of Form 5500 data for plan years ending in 2017
- Zone status applies to plan years ending in 2018 (estimated for some plans)
- > "Inactive" participants include terminated vested participants, retirees, and beneficiaries



Historical Returns and Yields



Source: Median investment returns for multiemployer plans per Segal Marco Advisors



Lower Returns, Higher Volatility

Rolling the Dice

Investors grappling with lower interest rates have to take bigger risks if they want to equal returns of two decades ago.

Estimates of what investors needed to earn 7.5%



Actuarial point of view?

Set investment return assumption based on plan asset allocation

Investment point of view?

Adjust plan asset allocation to increase likelihood of meeting desired return

*Likely amount by which returns could vary Source: Callan Associates

THE WALL STREET JOURNAL.



Expected Returns

Hypothetical Dancian Fund

> Note: Hypothetical asset allocation from WSJ / Callan Associates graphic

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Review of Expected Investment Re	eturns	Segal 2019	Marco Ad 9 Assumpt	visors ions	2019 Avera	Horizon Sı ıge Assum	urvey* ptions
		Average	Arithmetic	c Returns	Average	Arithmeti	c Returns
	Plan	10-Year	20-Year	Standard	10-Year	20-Year	Standard
Asset Classes	Allocation	Horizon	Horizon	Deviation	Horizon	Horizon	Deviation
Domestic Equity	41.0%	7.86%	8.40%	17.00%	7.56%	8.64%	17.17%
International Developed Equity	16.0%	8.86%	9.40%	20.00%	8.40%	9.30%	18.23%
Emerging Markets Equity	6.0%	11.26%	11.80%	24.00%	10.62%	11.67%	24.73%
Core Fixed Income	9.0%	3.21%	3.75%	5.50%	3.74%	4.46%	5.47%
High Yield Fixed Income	3.0%	5.76%	6.30%	11.00%	5.60%	6.38%	10.06%
Core Real Estate	13.0%	6.56%	7.10%	11.50%	6.95%	7.94%	15.03%
Commodities	0.0%	6.36%	6.90%	20.00%	5.41%	6.29%	17.66%
Short-Term Money Market	0.0%	2.56%	3.10%	2.50%	2.71%	3.07%	2.31%
Hedge Funds, GTAA, Risk Parity, Etc.	0.0%	5.56%	6.10%	5.80%	5.63%	6.61%	8.38%
Private Equity	12.0%	12.16%	12.70%	22.50%	11.34%	12.82%	22.05%
Total Plan Assets	100.0%	8.07%	8.61%	14.01%	7.85%	8.89%	14.11%
		10-Year	20-Year		10-Year	20-Year	
Annualized Geometric Returns		Horizon	Horizon		Horizon	Horizon	
90th Percentile		12.85%	11.72%		12.64%	12.02%	
75th Percentile		10.16%	9.82%		9.93%	10.10%	
50th Percentile (Median)		7.17%	7.70%		6.92%	7.97%	
25th Percentile		4.18%	5.59%		3.91%	5.85%	
10th Percentile		1.49%	3.69%		1.20%	3.93%	

* Survey of Capital Market Assumptions by Horizon Actuarial Services, LLC, 2019 Edition



Distribution of Expected Returns

> Note: Hypothetical asset allocation from WSJ / Callan Associates graphic



* Survey of Capital Market Assumptions by Horizon Actuarial Services, LLC, 2019 Edition



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Review strength of actuarial assumptions

- Investment return assumption
- Mortality, other demographic assumptions
- Administrative expense assumption

How demographically mature is your plan?

- Consider inactive/active participant ratio
- Consider net cash flow ("burn rate")

>What are your plan's funding levels?

• Consider both current and projected funded percentages

How resilient is your plan to adverse experience?

More mature plans tend to be less resilient



Actuarial Assumptions under ERISA

From ERISA section 304(c)(3)

- "Actuarial assumptions must be reasonable. For purposes of this section, all costs, liabilities, rates of interest, and other factors under the plan shall be determined on the basis of actuarial assumptions and methods –
 - (A) **each of which is reasonable** (taking into account the experience of the plan and reasonable expectations), and
 - (B) which, in combination, offer the actuary's best estimate of anticipated experience under the plan."

From ERISA section 305(b)(3) "...The actuary's projections shall be based on reasonable actuarial estimates, assumptions, and methods that, except [for assumptions regarding future industry activity], offer the actuary's best estimate of anticipated experience under the plan."



Actuarial Assumptions in the Aggregate

From Actuarial Standard of Practice (ASOP) on Modeling, Fourth Exposure Draft:

"Reasonable Model in the Aggregate – The actuary should assess whether the assumptions and parameters are reasonable in the aggregate. While assumptions and parameters might appear to be reasonable individually, conservativism or optimism in multiple assumptions and parameters may result in a set of assumptions and parameters that produces unreasonable output."

Two Green Zone Plans

Key Results for 2019	Plan A	Plan B
Zone Status	Green	Green
Investment Return Assumption	7.0%	7.0%
Funded Percentage	97%	81%
Inactive/Active Ratio	2.2	1.4
Net Cash Flow "Burn Rate"	-5.1%	-3.6%
Contributions/Assets	2.0%	6.2%

Plan A has been in the "green zone" since 2008

 Trustees have adopted modest changes in the future accrual rate over the years to remain in the "green zone"

Plan B was previously in critical status (and then in endangered status)

- Rehabilitation plan included benefit reductions and contribution rate increases
- Benefits and contributions under the rehabilitation plan remain in effect

Hypothetical Asset Allocation (Both Plans)

Time Horizon	10 Years	20 Years
Expected Return (Geometric)	6.6%	7.1%
Annual Volatility	11.2%	11.2%
Probabilities of Meeting Benchmarks 7.0% Annualized 6.0% Annualized 5.0% Annualized 4.0% Annualized	46% 58% 69% 78%	52% 67% 81% 90%



Plan A Sensitivities



Projected Funded Percentage



Plan A Sensitivities Continued



Projected Funded Percentage



Plan B Sensitivities



Projected Funded Percentage



Plan B Sensitivities Continued



Projected Funded Percentage





Two Plans: Commentary

Plan A is more "at risk" than Plan B

- More demographically mature
- More dependent on investment performance

Consider capacity for future corrective action

- Further adjustments to benefits?
- Further increases in contribution rates?

Consider strategies to reduce risk

• Perhaps over time, after meeting certain benchmarks?

>Also consider sensitivity to changes in future work levels



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Impact on Plan Liability

Lower investment return assumption = higher actuarial liability

>Illustrative impact of 50 basis point increase in return assumption:

Impact of 0.5% Reduction in Investment Return (from 7.5% to 7.0%)	Increase in Actuarial Accrued Liability
Actives	6% - 10%
Inactive Vested Participants	6% - 10%
Retirees and Beneficiaries	3% - 4%
Total Participants	5% - 6%

Impact of reduction in investment return on plan funding:

- > Plan liabilities: immediate increase in actuarial accrued liability
- Plan assets: no change in asset value
- Funded percentage: immediate decrease funded percentage
- Unfunded liability: immediate increase in unfunded liability
- Credit balance: increase in unfunded liability is amortized (paid for) over a 15-year period in the funding standard account (credit balance)

>What if plan is well-funded?

If a plan is well funded with a sharply increasing funded percentage, the plan's investment return assumption can probably be reduced without significantly harming current and future funding levels.

>What if plan is NOT well-funded?

If a plan does not have a significant funding standard account credit balance and a sharply increasing funded percentage, a decrease in the plan's investment return assumption will probably cause the plan to fall into a lower zone status and it may take years to recover.

Consider "glide path" approach.

Slowly moving the plan's investment return assumption from the current level to a desired level over time when certain benchmarks are reached (typically funded percentages).



Evaluating a potential reduction in the investment return assumption

- Trustees interested in reducing risk in investment portfolio
 - Lower investment risk likely means lower expected returns
 - Lower expected returns likely means lower return assumption
- Glide path approach to reducing return assumption:
 - Current assumption = 7.5%; target assumption = 6.5%
 - Applies to both liability interest rate and asset projection
 - Reduce assumption 0.25% each year funded percentage \geq 90%
- > Even with reduction in return assumption:
 - Projected funded percentage \geq 90% in each year from 2022-2025
 - Projected funded percentage \geq 100% by 2029
 - Plan is projected to remain in "green zone" in all future years



Case Study: "Glide Path" Projection

Plan Year	Assumed Investment Return	Total Hours (in Millions)	Contribution Rate	Funded Percentage
2019	7.50%	18.8	\$13.61	83%
2020	7.50%	18.8	\$13.86	85%
2021	7.50%	18.8	\$13.86	88%
2022	7.25%	18.8	\$13.86	89%
2023	7.00%	18.8	\$13.86	89%
2024	6.75%	18.8	\$13.86	90%
2025	6.50%	18.8	\$13.86	91%
2026	6.50%	18.8	\$13.86	93%
2027	6.50%	18.8	\$13.86	95%
2028	6.50%	18.8	\$13.86	98%

Note: Projected funded percentages shown above are after any change in the investment return assumption.



Case Study: Impact on Projected Funding Levels



Decreasing the investment return by 0.25% on each June 1 from 2022 to 2025 results in the Plan becoming 100% funded on June 1, 2029, 4 years later than in the Baseline projection.



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Overview

- Help manage risk, achieve certain funding targets
- Reduce subjectivity in benefit/funding decisions
- Must describe funding policy on annual funding notice

Possible objectives

- Meet ERISA minimum funding standards
- Meet other PPA targets (e.g., remain in the "green zone")
- Define when to take corrective action
- Define when appropriate to improve benefits



Documenting a funding policy

- Write into trust agreement, or document elsewhere?
- Guidelines or firm requirements?

Considerations

- What reasonable corrective actions could be taken?
- Trustee objectives, risk tolerance?
- Evaluate with stress testing or stochastic modeling
- Under what scenarios would the policy fail?



Example: Proactive Corrective Measures

When to take corrective measures?

The answer will vary based on plan-specific factors and trustee objectives.

EXAMPLE: No PPA action required, but plan is headed in wrong direction.

Year

QUESTION: Should the plan focus on meeting statutory requirements or take proactive corrective measures?



Projected Funded Percentage

What is the right amount of cushion?

The answer will vary based on plan-specific factors and trustee risk tolerance.

EXAMPLE: Plan is projected to be 120% funded in 15 years. Projected cushion enables plan to remain "green" after significant investment loss.



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Cannot completely eliminate risks

- But can significantly reduce them
- Transfer risk from plan to participants

Important considerations

- Hybrid design applies only to future service benefits
- Legacy plan (past service) liability remains a major concern
- In most cases, some (but not all) risk is transferred



Finding Balance



- Benefit level adequacy
- Stable, lifetime retirement income
- Understandability, perceived value



- Contribution rate sustainability
- Stable, predictable contribution rates



- Are benefits really guaranteed?
- Probability of delivering promised benefits?
- Consequences of underfunding?



Combine Elements of DB and DC Plans

- **DB:** traditional defined benefit pension plans
- **DC:** defined contribution savings plans

Key Advantages	Key Disadvantages
 Provide lifetime income 	 Legacy liability remains
 Reduce volatility in funding,	 Benefit levels may vary,
contribution requirements	therefore uncertain
 Higher probability of	 May be more difficult to
delivering promised benefits	communicate, understand

Is it feasible?

- Is there room in the "budget"?
- Legacy liability must still be funded

How to fund the legacy liability?

Reduce investment risk?

- Future service only? Legacy liability as well?
- Duration matching? Annuity purchase?
- Reduced risk = reduced return = higher costs



Discuss options with all Decision Makers

- What legal issues must be addressed?
- What are administrative concerns, complexities?

Evaluate via stochastic analysis

- Which option gives highest probability of success?
- What measures define "success"?

Keep in mind benefit adequacy

- Consider target income replacement ratio?
- Consider other sources of retirement income?



DC Plan • Freeze DB Plan; Start DC Plan

Hybrid Plan Options	 Cash Balance Plan Variable Accrual Rate Variable Annuity Plan Composite Plan*
	 Composite Plan*



^{*} Not yet permissible under law.



Actuarial Liabilities: Past and Future Service

Moving to an alternative plan design is not an overnight fix. Maintain commitment to legacy liability funding.



Freeze DB Plan

Freeze legacy DB plan

- No accruals under DB plan for future service
- Provide future service retirement benefits through DC plan

Requirements remain for legacy DB plan

- Future service counts for vesting in old DB plan
- ERISA/PPA funding standards still apply
- PBGC premiums must still be paid

Key Advantages	Key Disadvantages
 Freeze DB = stop adding to legacy liability Legacy liability will decline over time as benefits are paid out DC plan = stable costs for future service 	 Legacy liability remains Participants bear investment and longevity risk Participants may not make good investment decisions Purchasing annuities is very expensive

Cash Balance Plan

Benefit expressed as a hypothetical account

- Account grows with annual principal, interest credits
- Principal credits usually based on service
- Interest credits based on plan-specified rate

Technically DB plan

- Higher vesting requirement: 3 years of service
- Must satisfy QPSA, QJSA requirements, pay PBGC premiums

Key Advantages	Key Disadvantages
 Reduces investment risk Participant principal is protected Benefits are portable Benefits are subject to PBGC guarantees 	 Legacy liability remains Risks are not completely eliminated Participants exposed to longevity risk (or must pay premium for annuities) Annuitization is expensive, especially for older workers



Variable Accrual Rate

Future benefit accrual rate adjusts each year

Usually based on asset returns for prior year(s)

Benefits are fixed once they have been accrued

- Pension is sum of each year's accrual
- Pension remains fixed in retirement

	Key Advantages	Key Disadvantages
•	Reduces risk somewhat	Legacy liability remains
•	Removes subjectivity from benefit/funding decisions	 Risks are reduced but not eliminated
•	Benefits are fixed once accrued	Benefits are fixed once accrued
•	Benefits are subject to PBGC guarantees	Variable accrual much less powerful as plan maturesAccrual rate legal issues?



Variable Annuity Plan

Combines elements of DB and DC plans

- Provides lifetime income, like traditional defined benefit (DB) plan
- Reduces risk to plan sponsor, like defined contribution (DC) plan

Benefits automatically adjust each year based on asset returns

- Compare actual asset return vs. "hurdle rate"
- Stabilization strategies can be used to reduce benefit volatility

	Key Advantages	Key Disadvantages
•	Significantly reduces risk to plan sponsor	 Participant benefits may decline, even after retirement
•	Removes subjectivity from benefit/funding decisions	 Adding protections (floors, fixed post-retirement benefit) adds back risk exposure
•	Retiree benefits expected to outpace inflation over time	
•	Benefits are subject to PBGC guarantees	

Composite Plan

Combines elements of DB and DC plans

- Provides lifetime income like traditional DB plan
- Trustees adjust benefit levels each year to meet prescribed funding targets
 - Adjustments are not automatic, as with variable designs

By definition, neither DB nor DC

- No PBGC premiums, no PBGC guarantees (on future service)
- No employer withdrawal liability (on future service)

	Key Advantages	Key Disadvantages
•	Similar in many ways to traditional DB design	 Clearly defines legacy liability funding requirements
•	No PBGC premiums* No withdrawal liability* Clearly defines legacy liability funding requirements	 Plan retains some risk; reasonable actions may not meet funding obligations No PBGC guarantees* Not yet permitted under law
* On composite plan benefits for future service		

Key Takeaways

- Traditional DB pension model has flaws; as plans mature, exposure to risk increases
- Trustees may wish to consider hybrid plan designs to manage, reduce risk over time
- One size does not fit all; Trustees should find balance between benefits/contributions/risk

Keep an eye on Capitol Hill





Comments? Discussion?

