Session 027: Managing Risk for Underfunded Pension Plans

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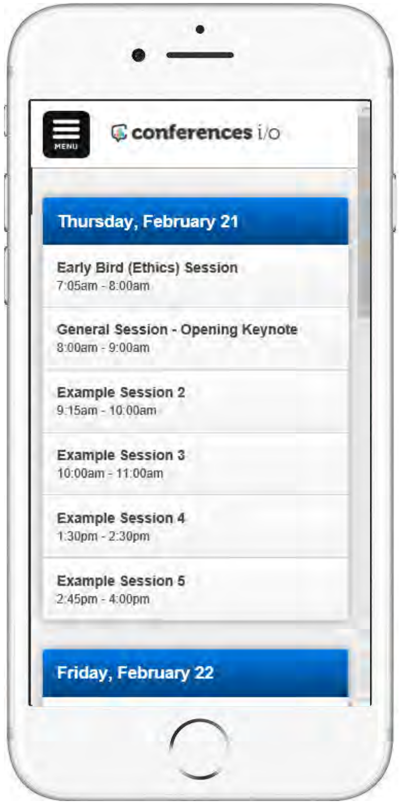

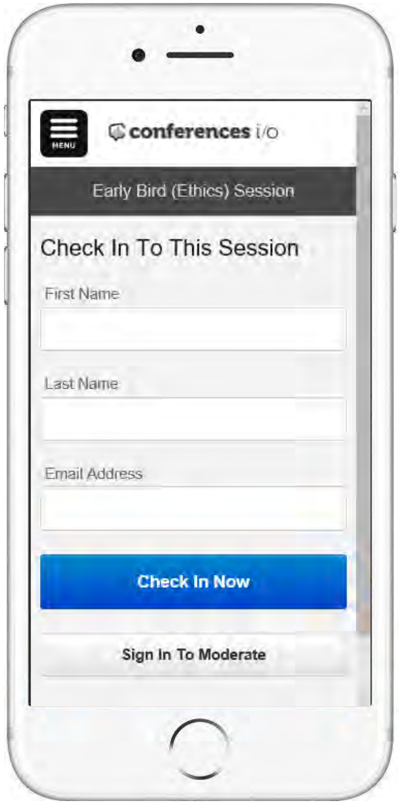

Session 027 – Managing Risk for Underfunded Plans

2019 SOA Annual Meeting - Toronto

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The setup

Identical twin plans

- Just like identical twins, imagine we have two pension funds that are identical in every way
  - Identical plan provisions
  - Identical participant populations
  - Identical demographics
- What if the twins on the left only saved half of their income and the ones on the right saved all of it?
- What if one pension plan is 50% funded, whereas the other is 100% funded?
- The goal of this session is to explore the risks of an underfunded plan

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Risk agenda for today's session

- Operational, regulatory, plan design
- Funding policy
  - One-time funding
  - Building a digestible funding budget
- Investment policy
- Is this a novel problem?

Animal trivia #1. Is this a deer mouse or mouse deer?

Animal trivia #2. What is a narwhal?

Unique challenges of underfunded defined benefit plans

Plan operations

- Single employer – Benefit restrictions
  - 60% < AFTAP < 80%
    - Limited lump sum payments
    - No increase in benefits
    - Participant notices
  - AFTAP < 60%
    - No lump sum payments
    - Mandatory plan freeze
    - Participant notices
  - Timing
  - Operation at end of restriction period

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Plan operations

- Significant administrative burden
  - Updated payment forms/bifurcated benefits
  - Updated distribution paperwork
  - Plan document governs treatment of forms of payment under restrictions

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Plan financing

- Higher minimum required contributions (and expected to rise)
- Increased volatility
- Higher PBGC premiums
- Higher administrative costs
- Higher consulting fees?
- Potential “at-risk” designation
- Cost of contributions may prevent contributing to other retirement vehicles

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Human resources

- Maintaining compliance (additional participant notifications/restrictions)
- If frozen, no benefit to current employees
- Outsourcing/co-sourcing administration

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Other regulatory bodies

- PBGC
  - Potential for Form 4010 filing (depending on size)
  - Capped PBGC Variable Rate Premium (contributing marginally more money or earlier does not reduce premium)
  - Potential for reportable events

Source: Alliance Pension Consultants.

Watching your speed

Hurdle rate defined to be the
asset growth rate to maintain funded status position

Hurdle rate can also be thought of as the discount rate + service cost

Example	
PV_0 =	100
Discount rate	7%
Service cost	5
PV_1 =	112
Liability growth	12

Hurdle rates		
Asset growth target	12	*Keep funded status surplus/(deficit) constant*
Hurdle rate (%) $_{100}$	12%	*If 100% funded, have $100 assets*
Hurdle rate (%) $_{80}$	15%	*Higher %, if have less assets (12/80)*
Hurdle rate (%) $_{50}$	24%	

Asset growth can come from
investment returns and/or cash contributions

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Lessons from financial economics

- Law of one price
- Irrelevance principle – Pension debt is just another form of corporate debt on first-order basis (leveraging/pension risk-taking does not add value on a risk-adjusted basis)
- Understating cost may lead to inflated benefit promises, diverted spending and unintentional/suboptimal risk-taking
- Underfunded plans have an opportunity to revisit risk-taking
  - Second-order effects (taxes, PBGC premiums, etc.) matter
  - **Increasing funding contributions into a pension plan can have a large ROI in today's environment**

Is the value of the pension benefit promise different?

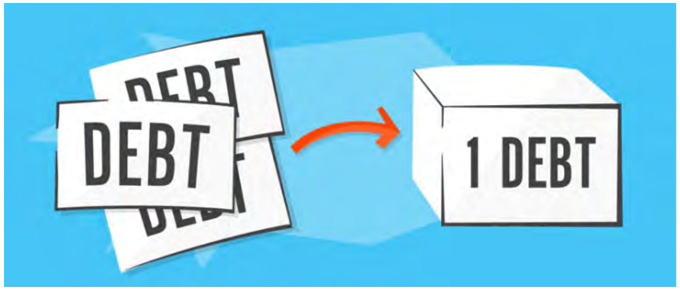

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Illustration of recent tax reform implications

- Consider incentives for corporate plan sponsors to accelerate contributions before tax reform

- Take advantage of:
  - Tax deductibility
  - Interest expense deductibility if issue more company debt, dependent on grandfathering
  - PBCG variable rate premium reduction

"Pension debt" is more expensive than corporate debt

Impact on balance sheet ($ millions)

Balance Sheet	Before	Issuing debt before new tax rate	After
Company Debt	(700)	(100)	(800)
Pension Debt	(100)	100	-
Pension Assets	*900*	*100*	*1,000*
Pension Liabilities	*(1,000)*	*-*	*(1,000)*
Total Debt	(800)	No change	(800)

Illustrative savings from issuing debt before Sep '18 ($ millions)

Savings Items	Amount	Comment
Tax Deduction of Pension Contribution	15.0	$100m saves $35m in taxes in 2017 vs. $20m in 2018+
Grandfathered Tax Deductibility		
Annual Interest Expense	4.0	*Assume 4% interest on new debt*
Annual Tax Savings	0.8	*Assume save 20% on new tax rate*
PV Factor	4.0	*Assume 5 years of tax savings assume 8% roic*
PV of Tax Deductibility	3.2	*PV of future tax savings from deductibility*
PBGC Variable Rate Premiums		
2016 VRP Savings	3.0	*Assume save paying VRP tax on $100m of UVB due to contribution*
2017 VRP Savings	3.4	*VRP % is increasing each year*
2018 VRP Savings	3.8	*VRP % is increasing each year*
2019 VRP Savings	4.2	*VRP % is increasing each year*
2020 VRP Savings	4.2	*Assume 0% index adjustment*
PV of first 5 years savings	14.7	*Assume 8% roic*
Total savings from issuing/contributing $100m in savings	**32.8**	

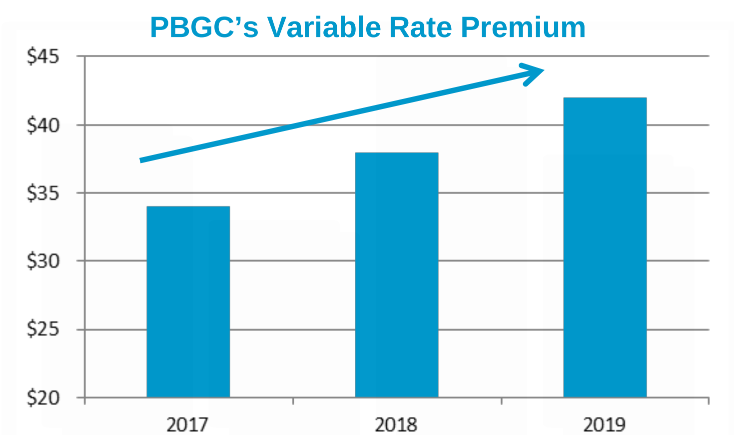
Source: LGIMA.
Illustrative based on potential scenario where corporate tax rate is reduced from 35% to 20% and interest expense deductibility is grandfathered on all corporate debt for 5 years.

Plan sponsors 2018

“Tax reform, PBGC fees drive US companies to open their wallets… 2018 corporate pension contribution tally to top $32 billion”[1]

🟩	General Electric:	$6.3 billion contribution
🟨	Lockheed Martin Corp:	$5.0 billion contribution
🟥	FedEx:	$2.5 billion contribution

“If I’m paying taxes currently and I can get a 35% deduction in the money I put in my plan now vs. 20% deduction in the future, it’s a lot cheaper to make that contribution now”[2]



“Sponsors are loath to pay those premiums” [2]

- By paying large contributions into the plan…
- It can help improve the funded status,
- Potentially reducing the premium to be paid,
- And ultimately benefitting the participants

Source: Pension & Investments.
[1]https://www.pionline.com/article/20180319/PRINT/180319874/2018-corporate-pension-contribution-tally-to-top-32-billion
[2]https://www.pionline.com/article/20170511/ONLINE/170519978/looming-tax-reform-spurs-hefty-corporate-pension-contributions

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Unique challenges of underfunded defined benefit plans

Case Study

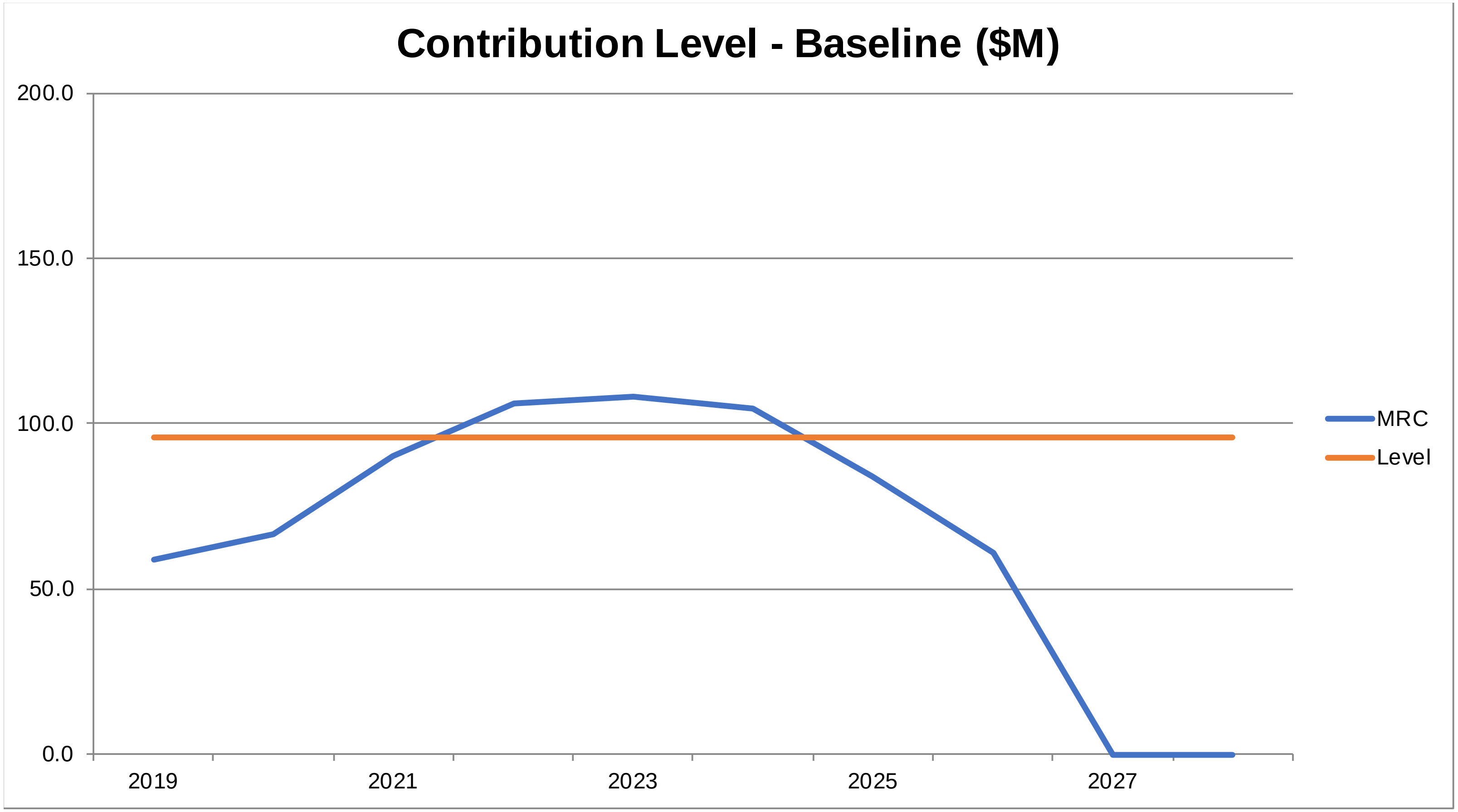
- Plan Sponsor maintains a frozen pension plan
  - Recently frozen upon acquisition
  - Acquiring company has never sponsored a defined benefit plan
  - Stochastic projections of “baseline“ and “shock” return scenarios
    - “Baseline” – current interest rate environment holds, 7% return
    - “Shock” – -10% portfolio returns for 2 consecutive years

- Contribution scenarios modeled
  - MRC – plan sponsor contributes minimum requirement each year
  - Level – contribution that can be made during projection that meets minimum required and does not change in projection period
    - Accelerates funding
    - Reduces PBGC premiums
    - Creates opportunity for credit balance/flexibility

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Plan financing

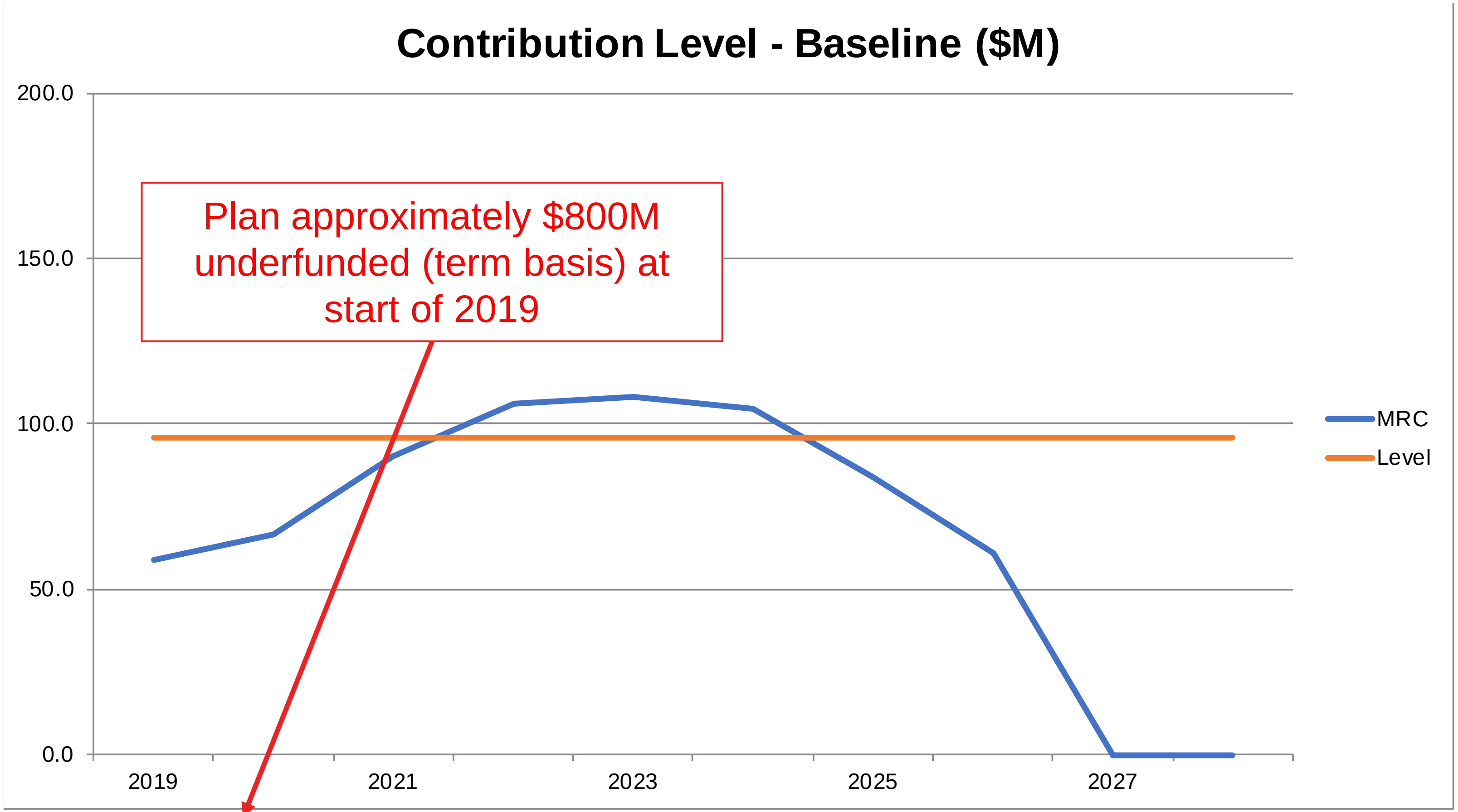


Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
MRC	59.0	66.5	90.4	106.1	108.4	104.5	84.1	60.8	0.0	0.0	679.8
Level	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	960.0

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Plan financing

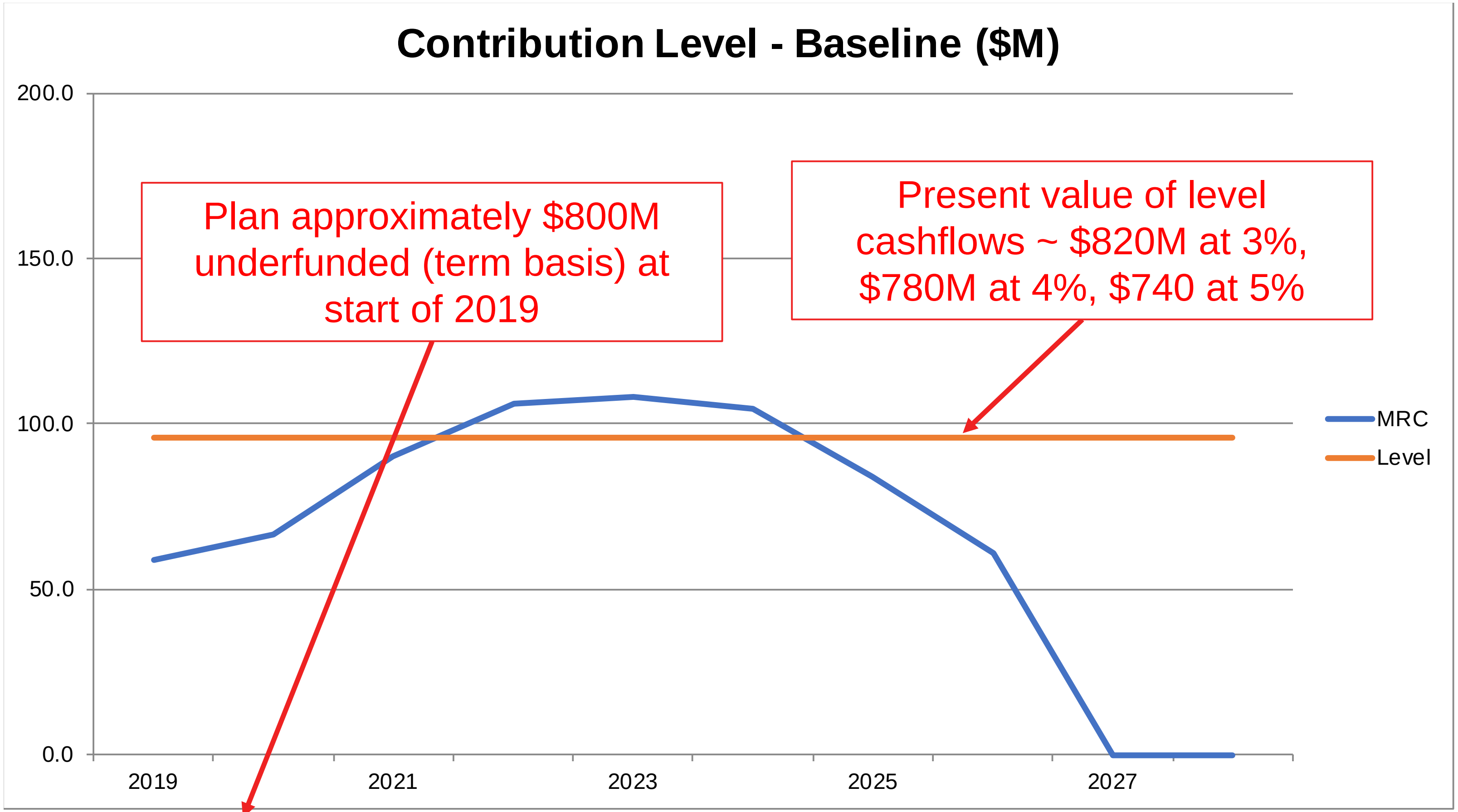


Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
MRC	59.0	66.5	90.4	106.1	108.4	104.5	84.1	60.8	0.0	0.0	679.8
Level	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	960.0

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Plan financing



Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
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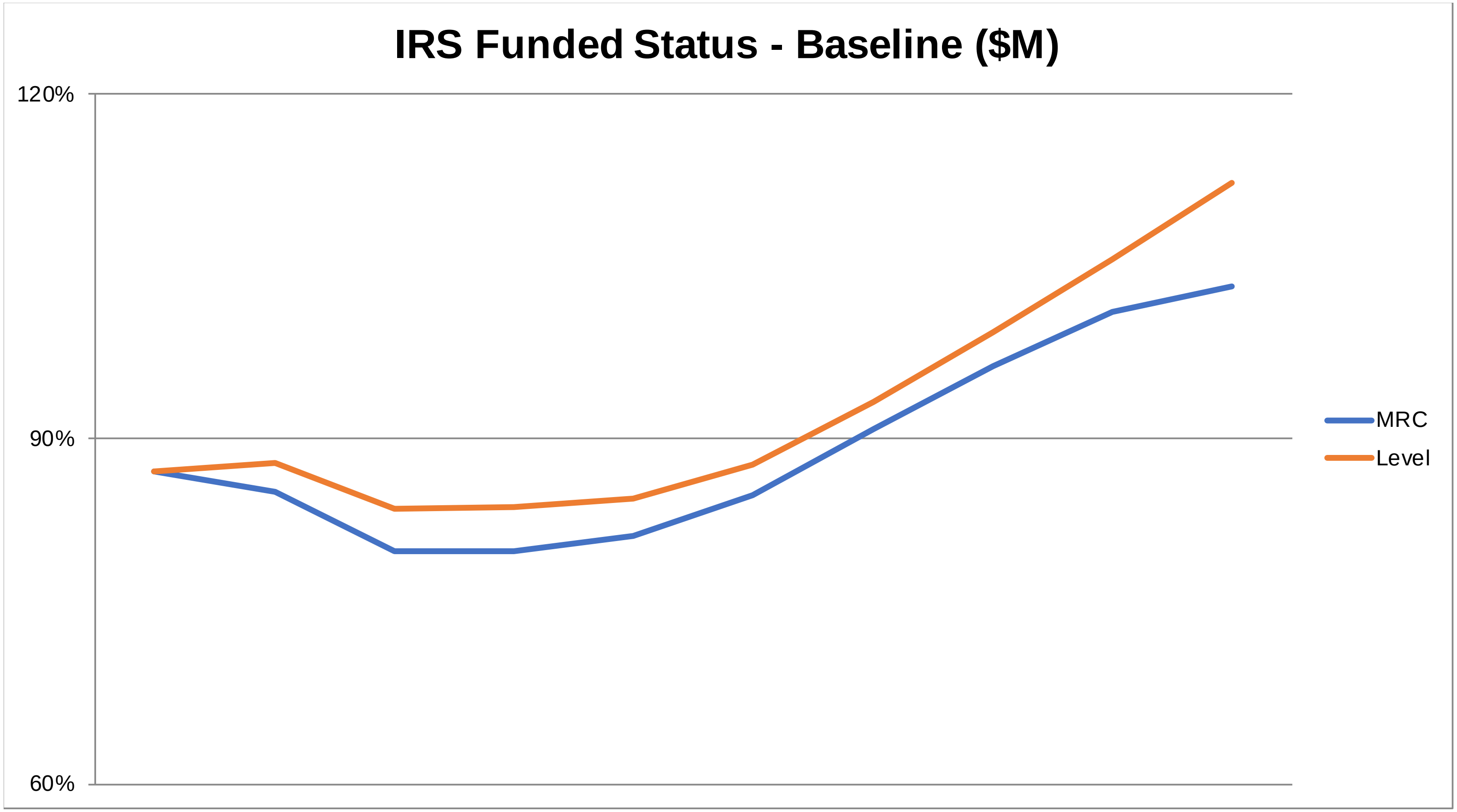
Level	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	960.0

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Plan financing

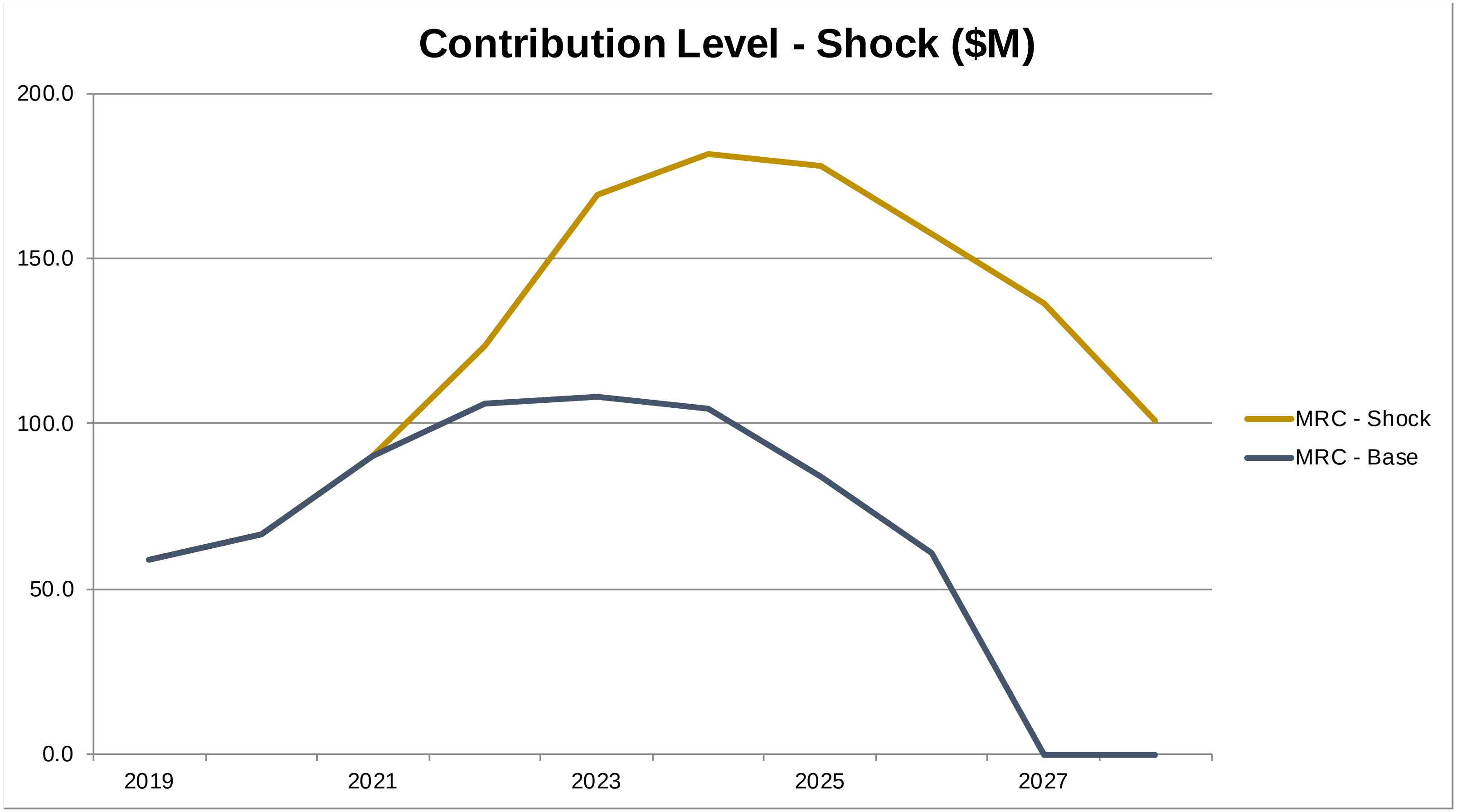


Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
MRC	87%	85%	80%	80%	82%	85%	91%	96%	101%	103%
Level	87%	88%	84%	84%	85%	88%	93%	99%	106%	112%

Source: Alliance Pension Consultants.

Unique challenges of underfunded defined benefit plans

Plan financing

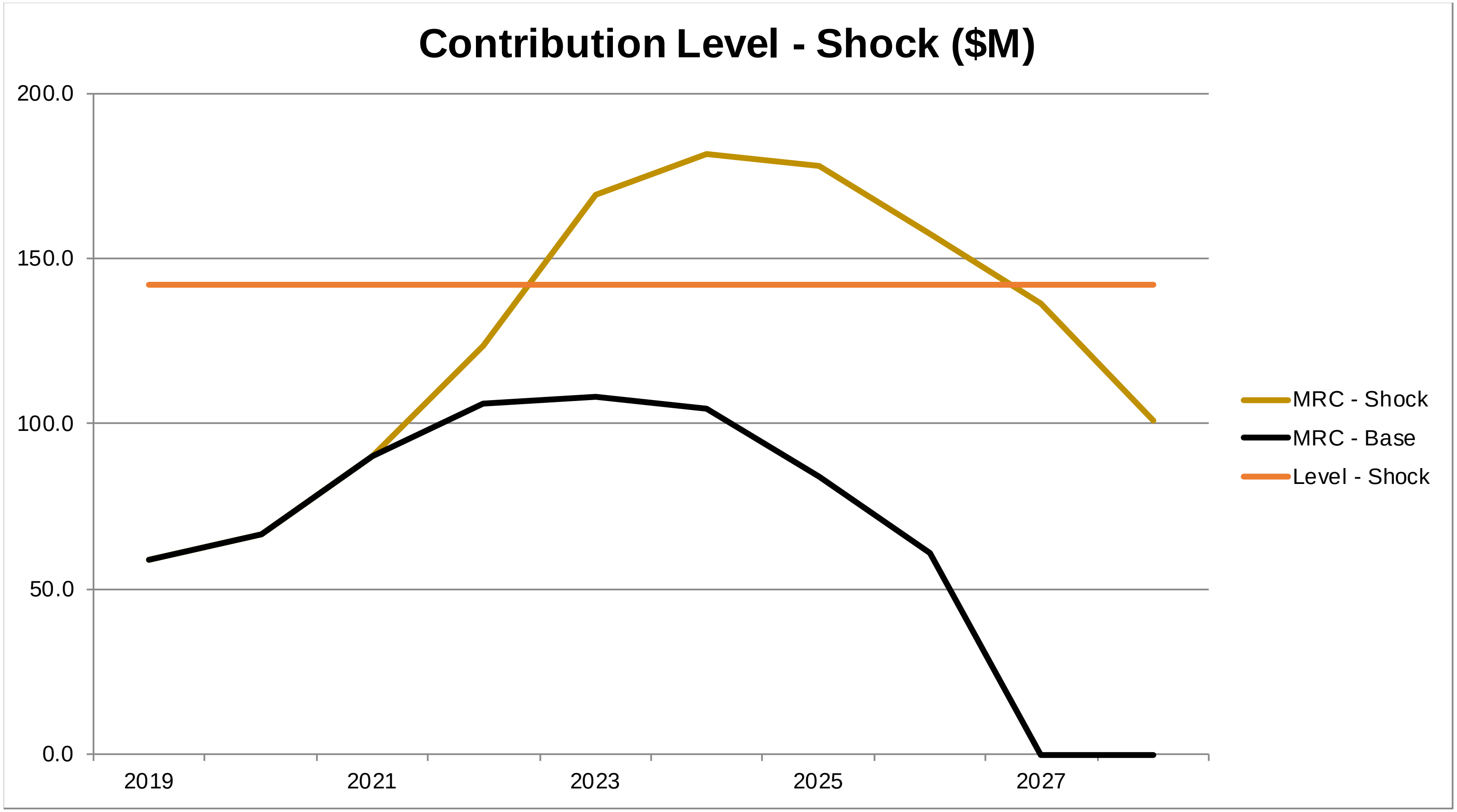


Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
MRC - Shock	59.0	66.5	90.4	123.4	169.4	181.8	177.8	157.4	136.3	101.2	1263.1
MRC - Base	59.0	66.5	90.4	106.1	108.4	104.5	84.1	60.8	0.0	0.0	679.8
Asset Return	7%	7%	-10%	-10%	7%	7%	7%	7%	7%	7%	

Source: Alliance Pension Consultants.
Charts depicted above are intended for illustrative purposes only.

Unique challenges of underfunded defined benefit plans

Plan financing



Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
MRC - Shock	59.0	66.5	90.4	123.4	169.4	181.8	177.8	157.4	136.3	101.2	1263.1
Level - Shock	142.0	142.0	142.0	142.0	142.0	142.0	142.0	142.0	142.0	142.0	1420.0
Asset Return	7%	7%	-10%	-10%	7%	7%	7%	7%	7%	7%	

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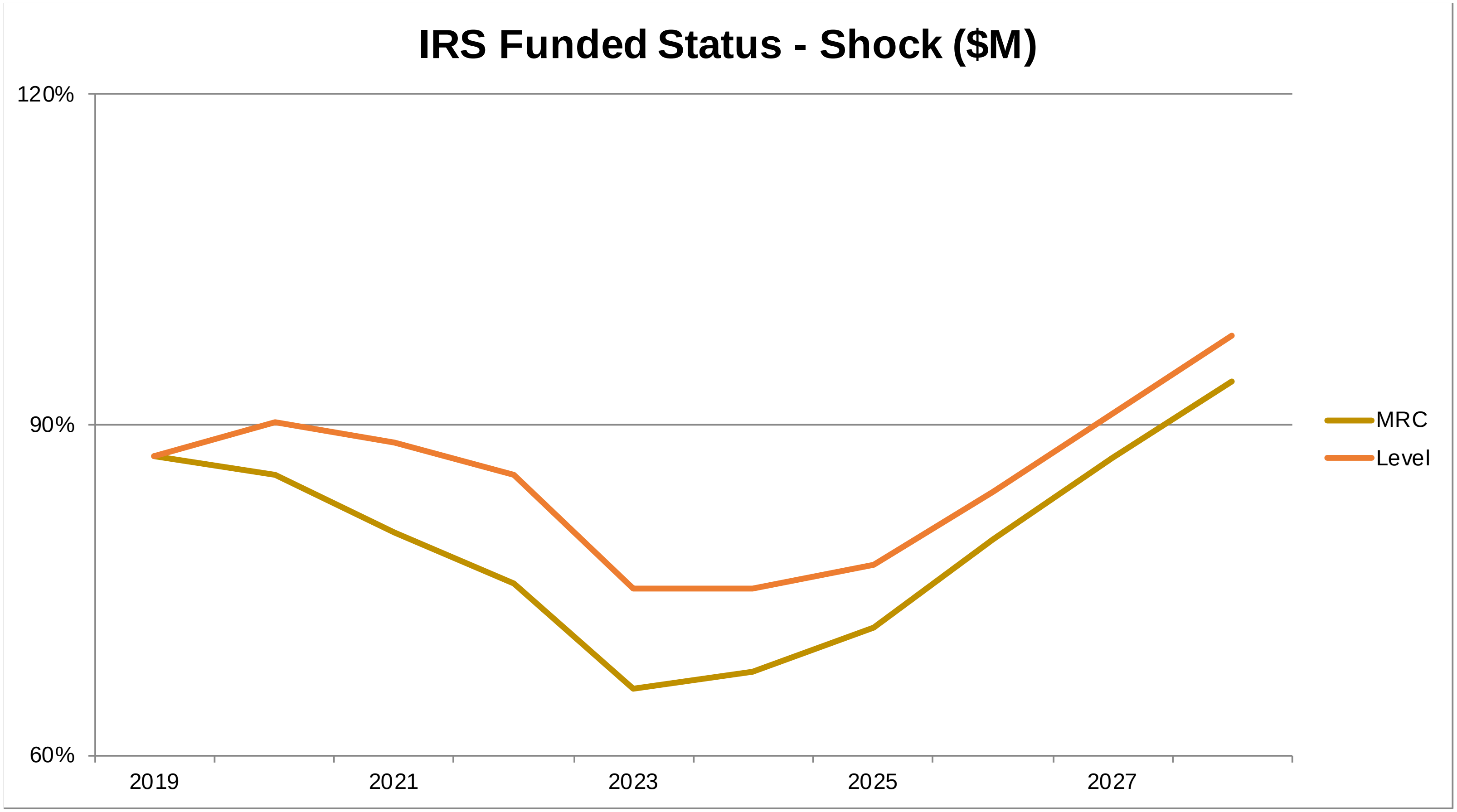
Unique challenges of underfunded defined benefit plans

Plan financing



Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
MRC	87%	85%	80%	76%	66%	68%	72%	80%	87%	94%
Level	87%	90%	88%	85%	75%	75%	77%	84%	91%	98%

Source: Alliance Pension Consultants.
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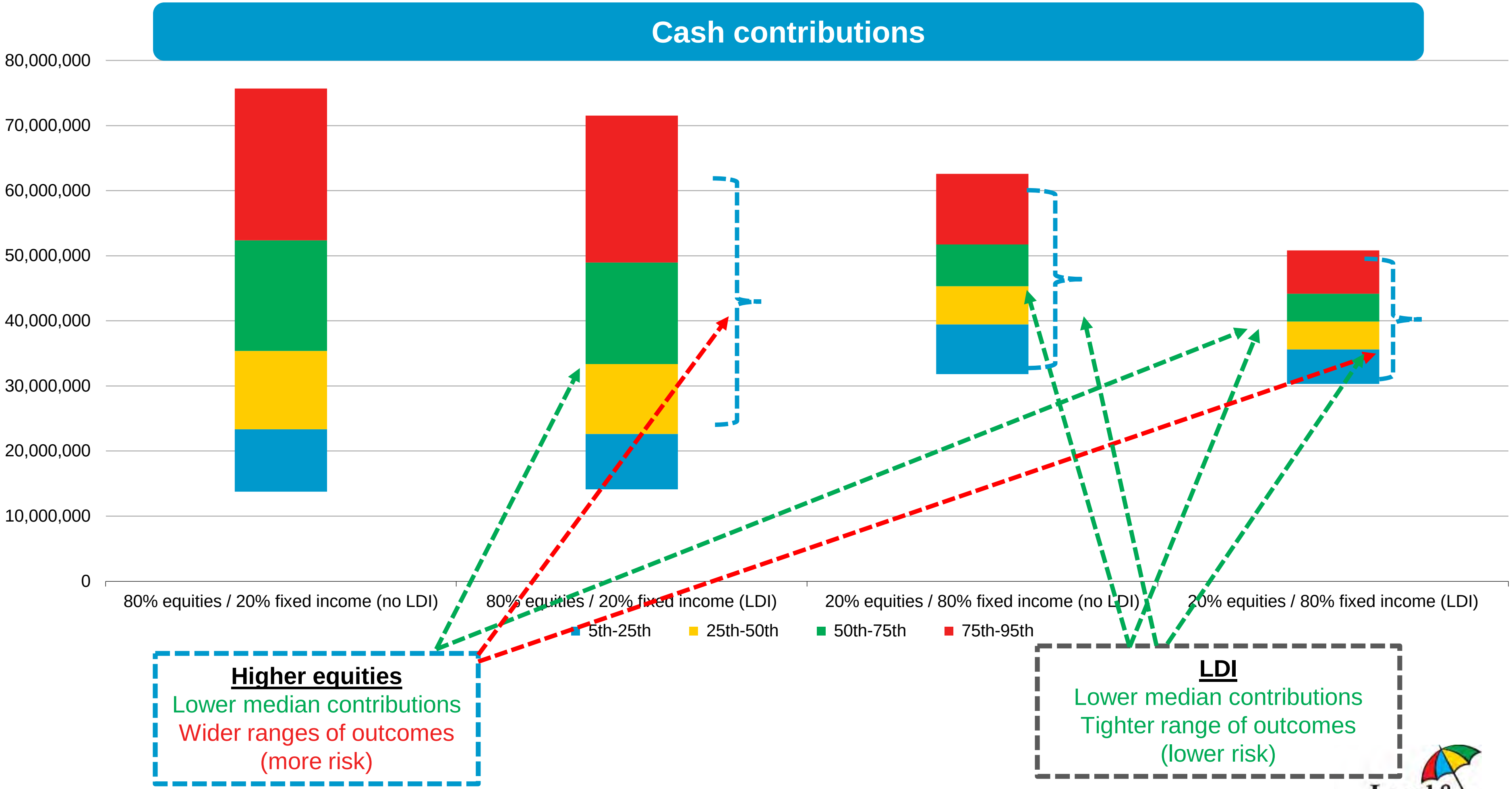
Investment policy

- Investment returns on Plan assets pay for future benefits
  - Assuming certain investment risks can reduce long-term cost measurements
  - Risk/reward is dependent on funded status given current rules regarding access to a pension surplus
- Simplified asset/liability model
  - At time 0, funded status is 50%
  - Assets can be invested in equities or fixed income
  - Fixed income can be invested in the Barclays Agg Index (minimal duration hedging), or be invested in a custom LDI fixed income portfolio (to maximize hedge of liability duration)
  - Assume cash contributions are made each month to equal 1/84 of the funding deficit (approximates 7-year amortization)
- Simulate asset and liability returns, cash contributions, and capture range of outcomes with statistics (median, 5th percentile, 95th percentile, etc.) for 20 years for four investment strategies
  - 80% equities / 20% fixed income (no LDI)
  - 80% equities / 20% fixed income (LDI)
  - 20% equities / 80% fixed income (no LDI)
  - 20% equities / 80% fixed income (LDI)

Range of 20-year cash contributions

- LGIMA presents the forward-looking estimates of the cash contributions for a 50% funded plan with various degrees of equities and leverage



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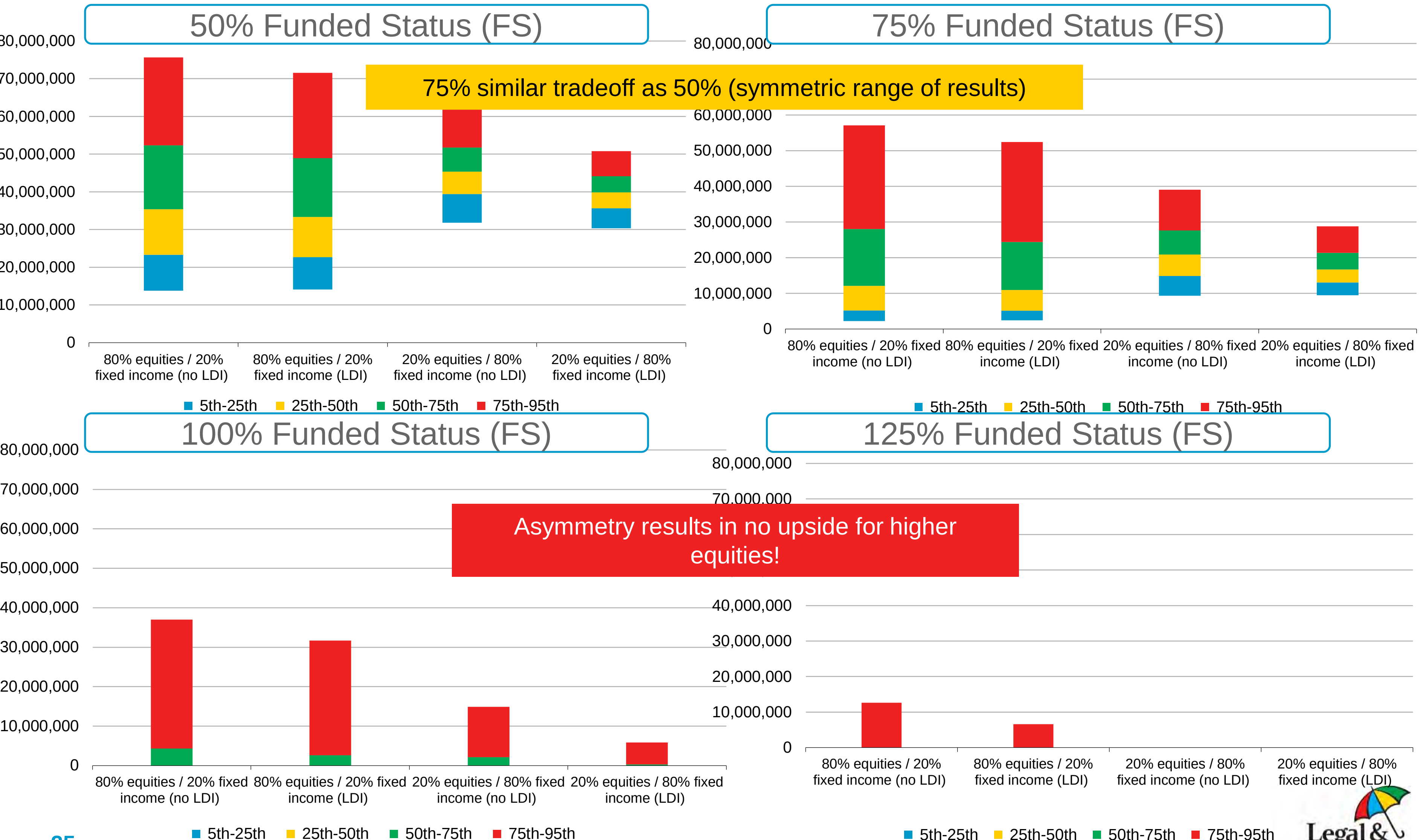
Required contributions for different funded plans



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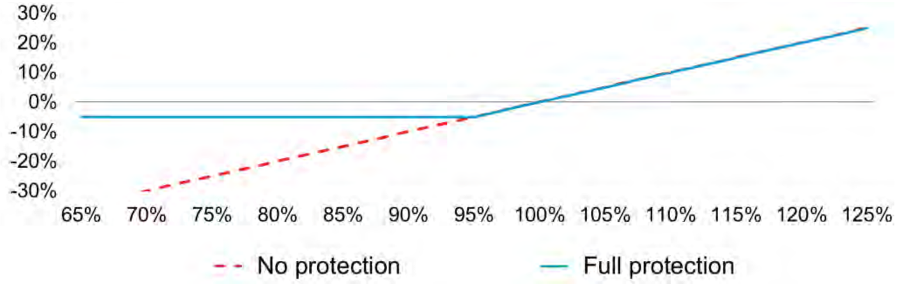
Equity protection – Overview and financial cost

Decreasing cost of protection

Full protection

A

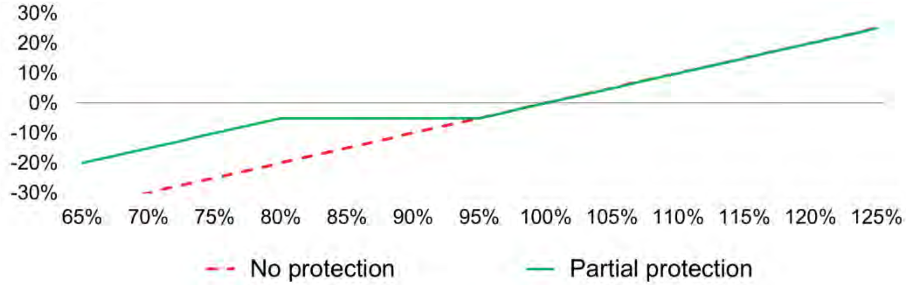
Limiting losses beyond 5%



Partial protection

B

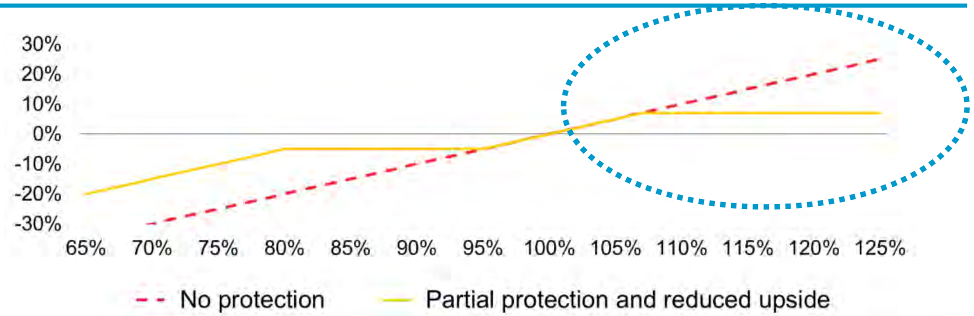
Ensures protection of 15% past the first 5% drawdown



Partial protection and reduced upside

C

Ensures protection of 15% past the first 5% drawdown; Foregoes upside past 10% given asymmetric nature of pension funding



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Client case study – *LDI and partial protection and reduced upside*

Plan Case Study

- Plan is 70% funded
- 70% of assets are in return seeking
- **Plan Objective**: Mitigate downside risk from falling equities

Client's XYZ Evolution

Implement LDI

LGIMA implements a new completion mandate to target Plan's hedging objectives

Plan continues to de-risk and implements a Long Duration Credit mandate

Equity Protection

Given market volatility, Plan explores an equity protection strategy

Recommended Protection Strategy

		Buy Put Spread	
Market	**Put Spread Strikes**	**Premium ($mm)**	**Premium (%)**
S&P 500	83 / 98	-18.5	-2.64%
Russell 2000	83 / 98	-6.1	-3.72%
EAFE	83 / 98	-16.5	-2.53%
Emerging Markets	83 / 98	-9.1	-4.56%
Total equity		**-50.2**	**-2.93%**

Reduce Premium

1 **Sell Rate Options**

Strike: ATMF + 40 bps

IRHR increase upon strike: 20%

Premium: $4.4 mm (0.26%)

2 **Sell Calls**

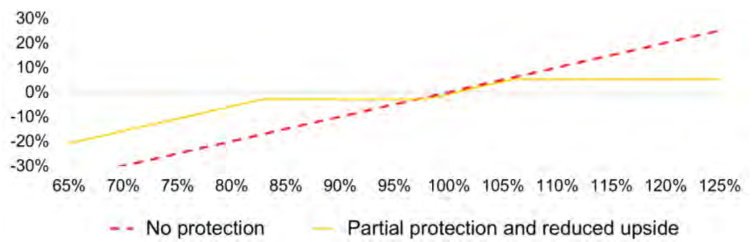
Strike: 106

% sold upside: 100%

Premium: $45.8 mm (2.67%)

Potential benefits: Partial Protection / Reduced Upside

- Receive premium foregoing some upside to help offset cost of protecting downside
- Benefit from market gains to a certain level, but be protected against equity market drawdowns
- Commit to additional hedging when rates rise
- Provides protection of 15% past the first 2% drawdown; foregoes upside past 6%



Net cost = Zero = -50.2 + 4.4 + 45.8

Source: LGIMA.
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The standard case

- Inspiration from Season 4, episode 5 of Revisionist History Podcast by Malcolm Gladwell
- Growing inability to solve problems with principles
- One practical approach from history is to solve problems via the case study method – see history of casuistry for a philosophical discourse
- What would the standard cases look like for a poorly funded plan?

Two standard cases

- If parents promise their child a sports car, don't save for it, and the parents leave the picture, the kid is not guaranteed the car by society at large

- If parents save money in a bank to pay for their child's education, and the bank goes bankrupt and loses the money they deposited, the government guarantees this savings balance

- What does it take for a pension plan to be closer to the green case?
  1. Measure pension risk and understand true cost
  2. Don't defer funding/savings for a plan's obligations
  3. Invest wisely

Questions?

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Questions

- **Chris Wittemann, CFA, FSA**
  Senior Solutions Strategist
  Legal & General Investment Management America
  71 South Wacker Drive, Suite 800, Chicago, IL 60606
  p 312.585.0328 | chris.wittemann@lgima.com

- **Chad A. Keuneke, FSA, EA, MAAA**
  Principal
  Alliance Pension Consultants, LLC
  1751 Lake Cook Road, Suite 400 | Deerfield, IL 60015
  p 224-330-6122 | ckeuneke@alliancepension.com

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