

Appropriateness of Current Assumptions

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The opinions expressed in this presentation are those of the presenter and do not necessarily represent the views of the Segal Group or the National Coordinating Committee for Multiemployer Plans.



Discussion Topics

- **Introduction and Brief History**
- **Statutory and Professional Requirements**
- **Evaluating the Investment Return Assumption**
- **Multiemployer Universe: Then and Now**
- **Segal “Data” Publication**



Introduction and a Brief History



Introduction

Interest rate assumption

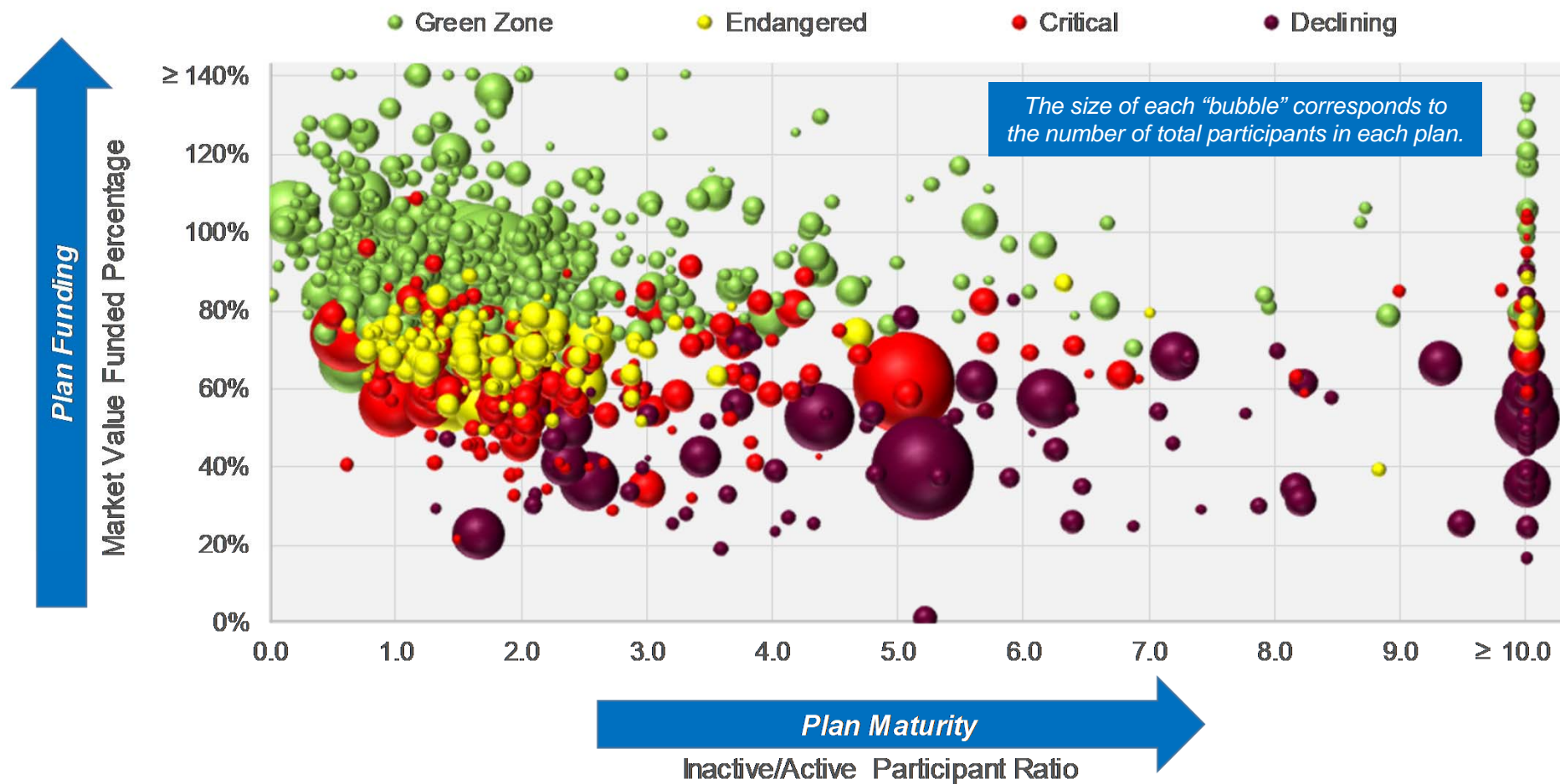
- Discount rate used to determine present value of benefit obligations
- Traditionally represents expected return on plan assets
- Alternatively, may be a market-based, risk-defeasement measure

Current funding rules

- Single-employer pension plans
 - Required to use assumption based on corporate bond rates
 - Special relief measures allow 25-year interest rate smoothing
 - Effective interest rate for most plans is around 5.5% (with smoothing)
- Multiemployer pension plans
 - Assumption is actuary's best estimate of future plan experience
 - Most plans have interest rates between 7.0% and 7.5%

Multiemployer Pension Universe

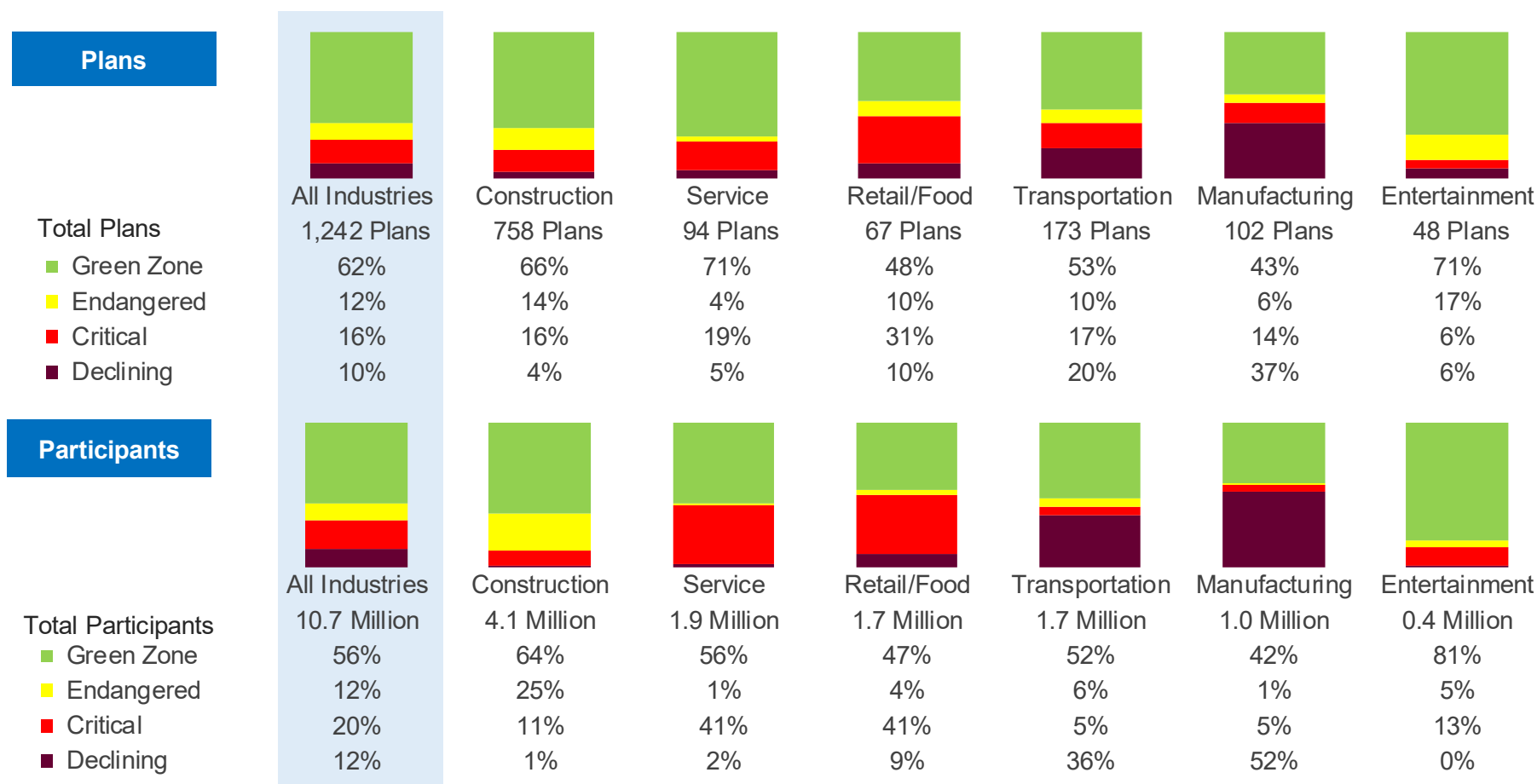
Multiemployer Pension Universe



Plan Count: 1,242

Source: Segal Consulting analysis of Form 5500 data for plan years ending in 2016. Zone status applies to plan years ending in 2017.

Zone Status by Industry



Percentages may not add, 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 2016. Zone status applies to plan years ending in 2017.

A Brief History

Pre-ERISA

- No federal funding standards
- Studebaker bankruptcy in 1964 – major default on pension promises

Passage of ERISA

- ERISA = Employee Retirement Income Security Act of 1974
- Anti-cutback rule: accrued benefit protections
- Minimum funding standards
 - “Funding standard account” targets 100% funding over 15-20 years
 - Based on long-term actuarial assumptions
- PBGC established to support insolvent plans

A Brief History *Continued*

1980s

- Strong investment returns
- Market interest rates in double digits
- Actuarial interest rate assumptions gradually increased
 - In 1980, most actuaries used assumptions around 5.0%
 - Scrutiny over assumptions being *too conservative*
 - Lower interest rates = higher plan liabilities = greater tax-deductions
 - By mid 1980s, most assumptions were raised to between 7.0% and 8.0%

1990s

- Continued strong investment returns
- Most private sector plans were close to full-funding, some were over-funded
- IRS rules limited tax-deductibility of employer contributions to fully-funded plans
 - Many corporate plan sponsors took “contribution holidays”
 - Many multiemployer plan sponsors increased benefits to preserve tax-deductibility of previously-negotiated employer contributions

A Brief History *Continued*

Passage of PPA

- “Dot-Com Bubble Burst” from 2000 to 2002
 - Plan sponsors scrambled to restore plan funding levels
 - Notable corporate bankruptcies, plans turned over to PBGC
 - Corporations began to close, freeze their DB plans
- PPA = Pension Protection Act of 2006
 - Overhaul of funding rules for single-employer plans
 - Mandated actuarial assumptions, shorter funding periods
 - Increased trend for freezing DB plans
 - Modifications to funding rules for multiemployer plans
 - Continue using long-term actuarial assumptions
 - Limit amortization periods to 15 years
 - Additional rules for plans in critical or endangered status
 - Critical status plans may reduce “adjustable benefits”
 - Critical status plans may also declare “exhaustion of reasonable measures”

A Brief History *Continued*

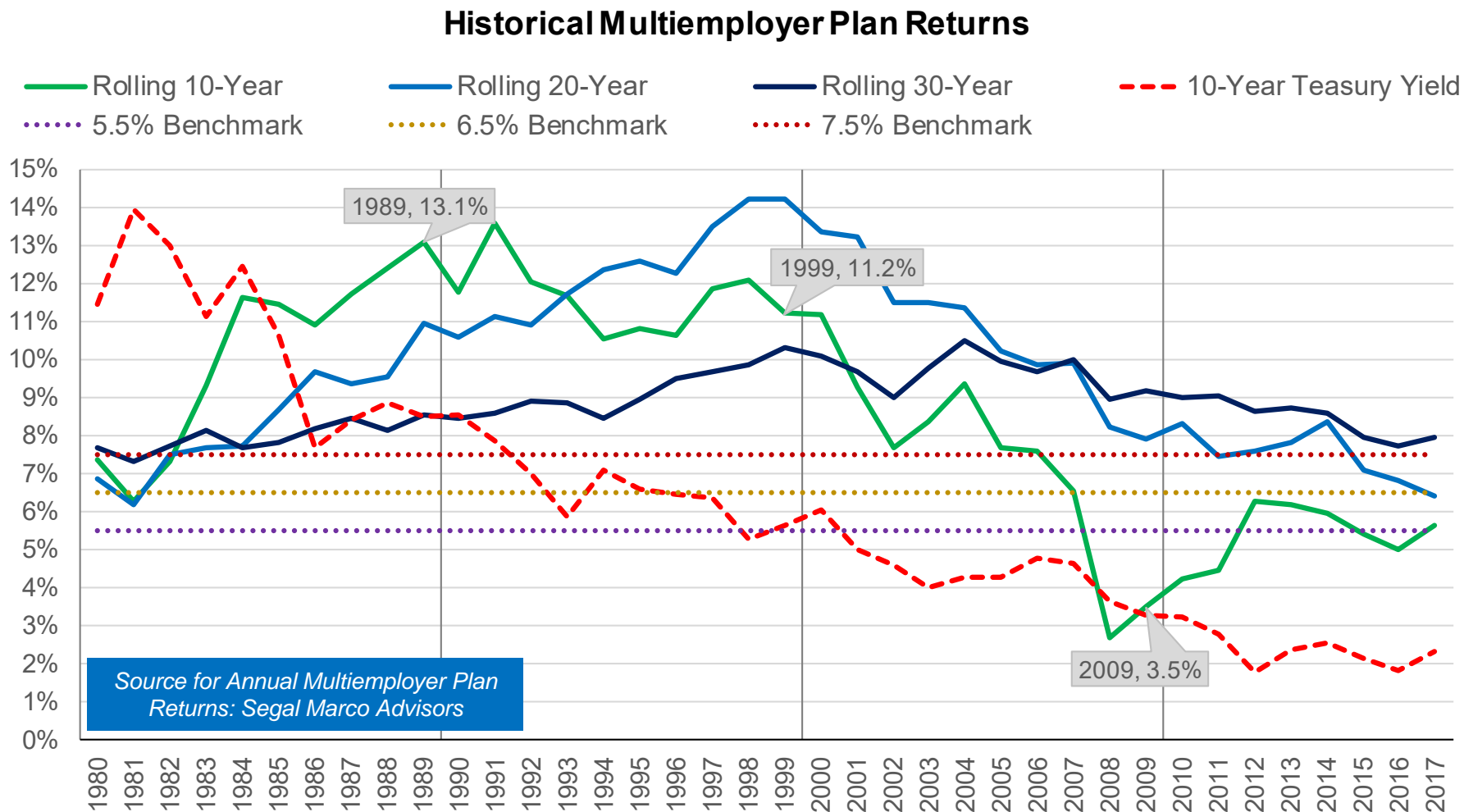
Post-PPA

- Financial market collapse of 2008 and early 2009
 - Interest rates fell to historic lows
 - Declining work levels following Great Recession
- Multiemployer plans:
 - Median investment return for 2008 = about -23%
 - Plan sponsors developed plans to restore funding under new PPA rules
 - Significant increases in contribution rates, reductions in benefit levels
 - Most succeeded in improving funding levels, others did not

Passage of MPRA

- MPRA= Multiemployer Pension Reform Act of 2014
- Additional tools to enable plans in “critical and declining” to avoid insolvency
 - Benefit suspensions (i.e., reduction in accrued benefits, subject to limitations)
 - PBGC partitions (subject to PBGC available resources)
 - PBGC facilitated mergers (subject to PBGC available resources)

Historical Investment Returns



- Rolling 30-year returns have been consistently above 7.5% benchmark
- Rolling 10-year returns for 1980s, 1990s, and 2000s highlighted for reference
- *Note: annualized 8-year return from 2010-2017 is 8.3%*



Statutory and Professional Requirements



Actuarial Assumptions under PPA

Excerpt: ERISA Section 304(c) / Code Section 432(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.

*Note: Provisions amended by the
Pension Protection Act of 2006*

Actuarial Standards of Practice No. 27

“ASOP” No. 27 = *Selection of Economic Assumptions for Measuring Pension Obligations*

General

➤ **Selecting a reasonable assumption**

- Appropriate for purpose of the measurement
- Reflects the actuary’s professional judgment
- Takes into account relevant historical and current economic data
- Reflects actuary’s estimate of future experience (or estimates in market data)
- Has no significant bias

➤ **Range of reasonable assumptions**

- Actuaries may choose different reasonable assumptions
- Individual actuary may have a range of reasonable assumptions
- Range of reasonable assumptions may also apply across actuarial practice

➤ **Adjustment for adverse deviation may be appropriate**

Actuarial Standards of Practice No. 27 *Continued*

Selecting an Investment Return Assumption

➤ Reflects anticipated returns on plan assets

- May consider economic data and judgment of investment professionals
- Avoid undue weight to recent experience
- Consider changes in underlying environment when evaluating historical data

➤ Factors to consider:

- time value of money ▪ inflation, inflation risk ▪ illiquidity ▪ credit risk
- macroeconomic conditions ▪ growth in earnings, dividends, and rents

➤ Investment data may include:

- current fixed income yields ▪ inflation forecasts, GDP growth
- historical investment and yield data ▪ historical plan performance

➤ Measurement-specific considerations:

- plan's investment policy ▪ effect of reinvestment ▪ investment volatility
- investment manager performance ▪ investment and administrative expenses
- cash flow timing ▪ benefit volatility ▪ expected plan termination ▪ tax status
- arithmetic vs. geometric returns

Investment Return Assumptions under MPRA

Excerpt: Proposed Treasury Regulations (June 2015)

“Reasonable actuarial assumptions and methods. The actuarial assumptions and methods used for the actuarial projections must be reasonable, in accordance with the rules of section 431(c)(3).”

Excerpts: Final Treasury Regulations (April 2016)

“... actuarial assumptions must be reasonable for the purpose of the measurement” (under the applicable ASOPs)

“... to the extent anticipated rates of return are expected to be smaller or larger during the portion of that period when the level of plan assets is expected to be relatively higher... it would not be appropriate to develop an actuarial assumption for the rate of investment return based solely on long-term expectations without taking these differences into account.”

Footnote: “Methods for developing an assumption for the rate of return that would be appropriate for purposes of the measurement include: (1) Using a select and ultimate assumption that includes different assumptions of investment returns for different portions of the projection period, or (2) developing a return assumption based on dollar-weighted returns over the projection period.”

Continued Evolution of the ASOPs

ASOP 51 = Assessment and Disclosure of Pension Risk

- New standard, published September 2017
- Advise plan sponsor on risk associated with pension plans
 - “Risk” = chance actual experience is worse than actuarial assumptions
 - Deterministic scenario and stress testing; stochastic modeling
 - New focus on increasing demographic maturity

ASOP 4 = Measuring Pension Obligations

- *Exposure draft*, published March 2018
- New concept: “investment risk defeasement measure”
 - Measurement of plan liabilities based on risk-free discount rate
 - Intended for disclosure only
 - Does not represent actuarial best estimate
 - Does not serve basis for actuarially-determined contribution



Evaluating the Investment Return Assumption

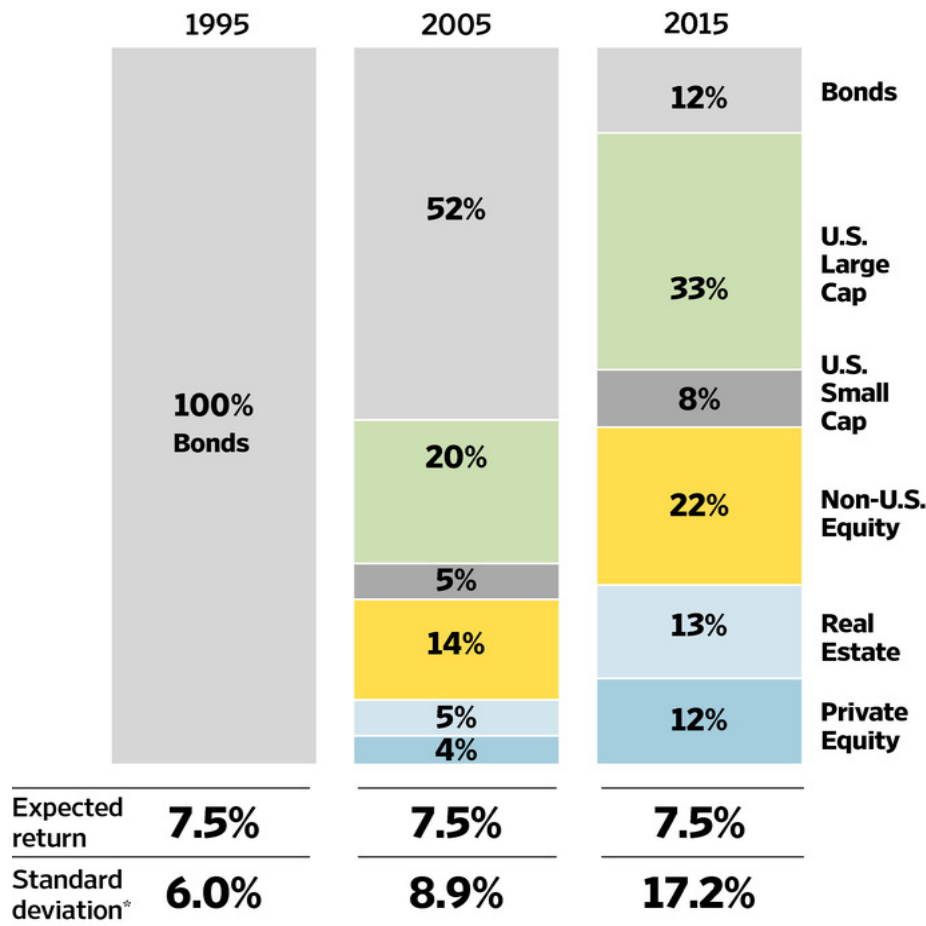


Lower Returns, Higher Risk

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%



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

THE WALL STREET JOURNAL.

A Common Conundrum

➤ Actuarial point of view

- Set interest assumption based on plan asset allocation

➤ Investment point of view

- Adjust plan asset allocation to maximize likelihood of meeting benchmark return assumption

➤ Have benchmarks been set?

- PPA funding improvement and rehabilitation plans already been adopted based on benchmark return assumption
- How much flexibility is there to change the benchmark return assumption and/or asset allocation and still meet funding targets?

Expected Returns

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

Hypothetical Pension Fund Review of Expected Investment Returns

Segal Marco Advisors 2018 Assumptions

2018 Horizon Survey* Average Assumptions

Asset Classes	Plan Allocation	Average Arithmetic Returns			Average Arithmetic Returns		
		10-Year Horizon	20-Year Horizon	Standard Deviation	10-Year Horizon	20-Year Horizon	Standard Deviation
Domestic Equity	41.0%	7.86%	8.40%	17.00%	7.63%	9.08%	17.34%
International Developed Equity	16.0%	8.86%	9.40%	20.00%	8.36%	9.46%	18.67%
Emerging Markets Equity	6.0%	11.26%	11.80%	24.00%	10.52%	11.94%	24.89%
Core Fixed Income	9.0%	3.21%	3.75%	5.50%	3.54%	4.63%	5.71%
High Yield Fixed Income	3.0%	5.76%	6.30%	11.00%	5.29%	6.44%	10.24%
Core Real Estate	13.0%	6.56%	7.10%	11.50%	6.89%	7.67%	13.86%
Commodities	0.0%	6.36%	6.90%	20.00%	5.46%	6.47%	17.89%
Short-Term Money Market	0.0%	2.56%	3.10%	2.50%	2.55%	3.10%	2.74%
Hedge Funds, GTAA, Risk Parity, Etc.	0.0%	5.56%	6.10%	5.80%	5.29%	6.61%	7.87%
Private Equity	12.0%	12.16%	12.70%	22.50%	10.72%	12.17%	22.16%
Total Plan Assets	100.0%	8.07%	8.61%	14.01%	7.76%	9.02%	14.07%

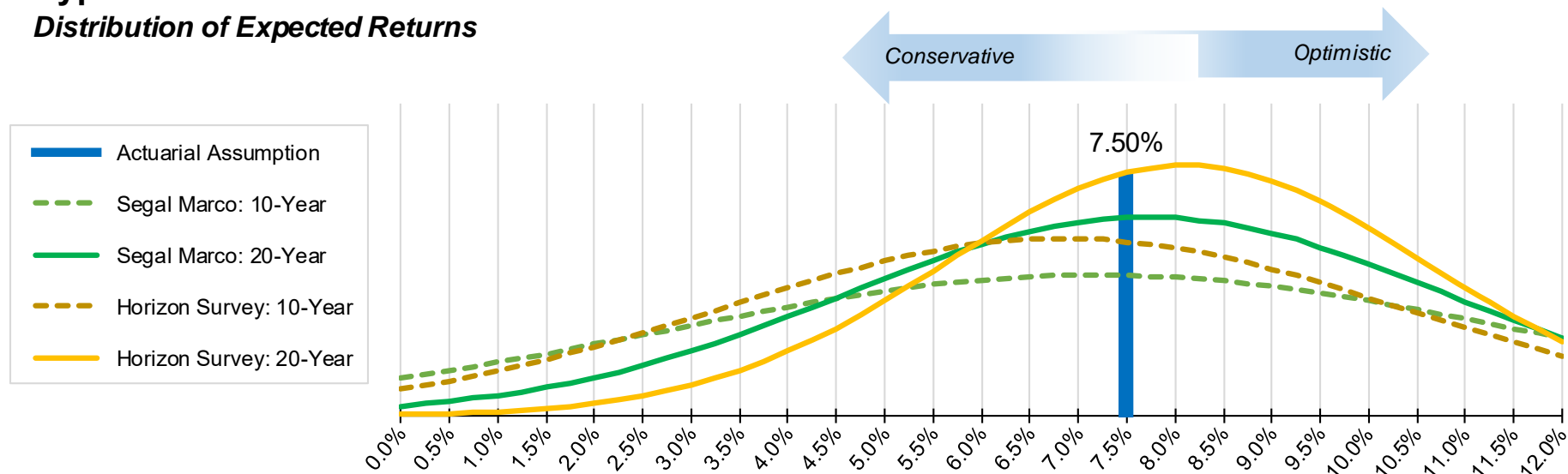
Annualized Geometric Returns	10-Year Horizon	20-Year Horizon	10-Year Horizon	20-Year Horizon
90th Percentile	12.85%	11.72%	11.34%	11.29%
75th Percentile	10.16%	9.82%	9.20%	9.78%
50th Percentile (Median)	7.17%	7.70%	6.83%	8.11%
25th Percentile	4.18%	5.59%	4.46%	6.43%
10th Percentile	1.49%	3.69%	2.33%	4.92%

* Survey of Capital Market Assumptions by Horizon Actuarial Services, LLC, 2018 Edition

Distribution of Expected Returns

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

Hypothetical Pension Fund Distribution of Expected Returns



For this exercise, returns are assumed to be normally-distributed

**Segal Marco Advisors
2018 Assumptions**

**2018 Horizon Survey*
Average Assumptions**

<i>Probabilities of Meeting Benchmark Returns</i>	10-Year Horizon	20-Year Horizon	10-Year Horizon	20-Year Horizon
Annualized Returns of 7.50%	47.0%	52.6%	42.5%	59.7%
Annualized Returns of 6.50%	56.0%	65.0%	53.8%	74.1%
Annualized Returns of 5.50%	64.7%	75.9%	64.8%	85.3%

* Survey of Capital Market Assumptions by Horizon Actuarial Services, LLC, 2018 Edition



Multiemployer Universe: Then and Now



Multiemployer Universe: Introduction

Based on Form 5500 data

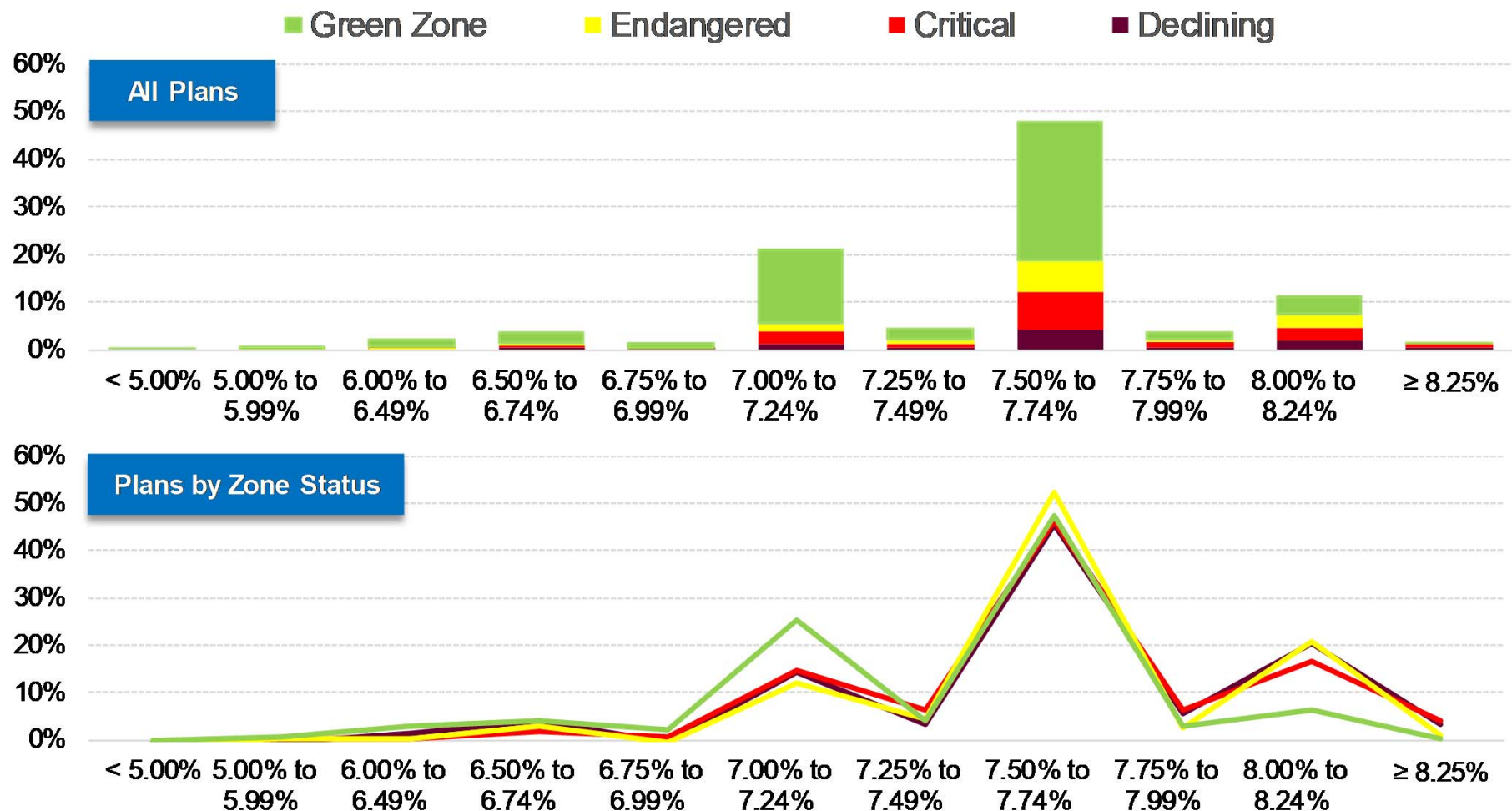
- Publicly available on DOL website
- Data prior to 1999 is not available; data prior to 2002 is spotty
 - Long-term historical analysis not possible
- Data last collected for plan years ending in 2016 (e.g., 12/31/2016)

Analysis: how do results differ by “zone status”?

- Group plans by zone status for plan years ending in 2017
 - Zone status considers other publicly-available information (e.g., notices)
 - Zone status may be estimated in some cases
- Notable years / periods:
 - 2016 = latest available data
 - 2007 = before the 2008 market collapse and Great Recession
 - 2002 = earliest complete dataset available; post-Dot Com Bubble burst

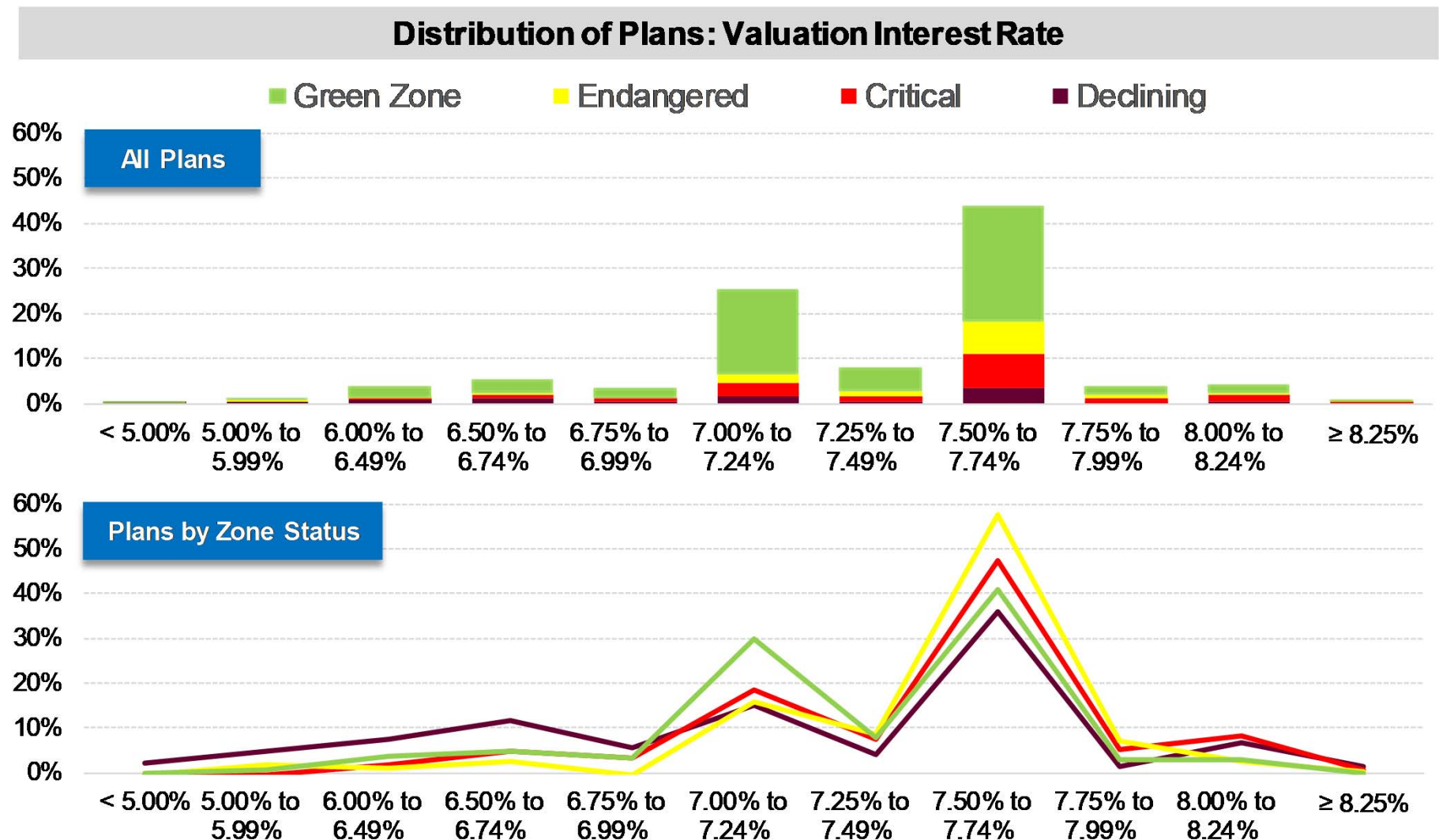
Interest Rate Assumptions: 2007

Distribution of Plans: Valuation Interest Rate in 2007



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

Interest Rate Assumptions: 2016

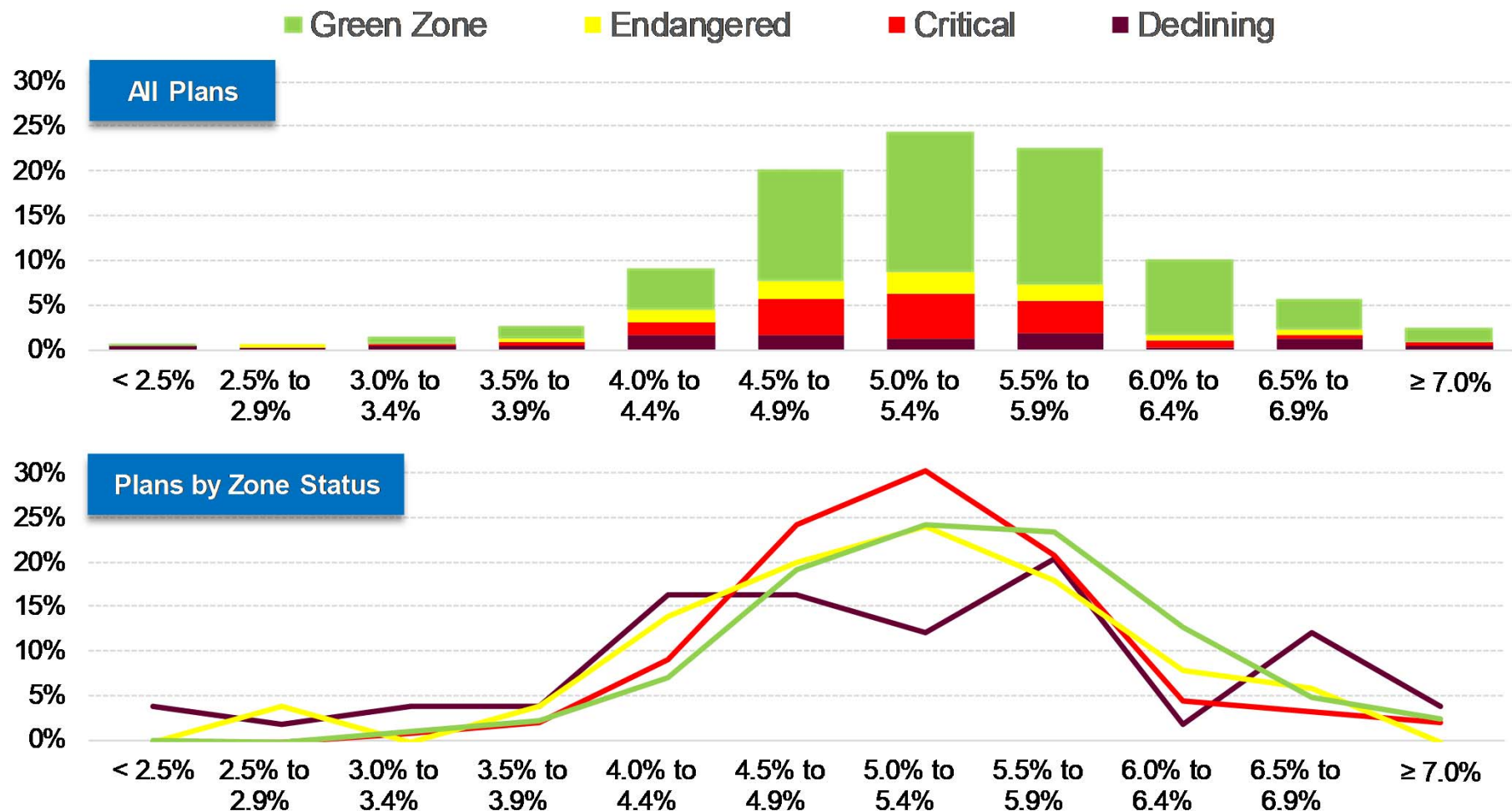


Source: Segal Consulting analysis of Form 5500 data for plan years ending in 2016. Zone status applies to plan years ending in 2017.

Annualized Returns: 2002-2016

Calendar Year Plans Only

Distribution of Plans: Annualized Returns, 2002-2016 (15 Years)



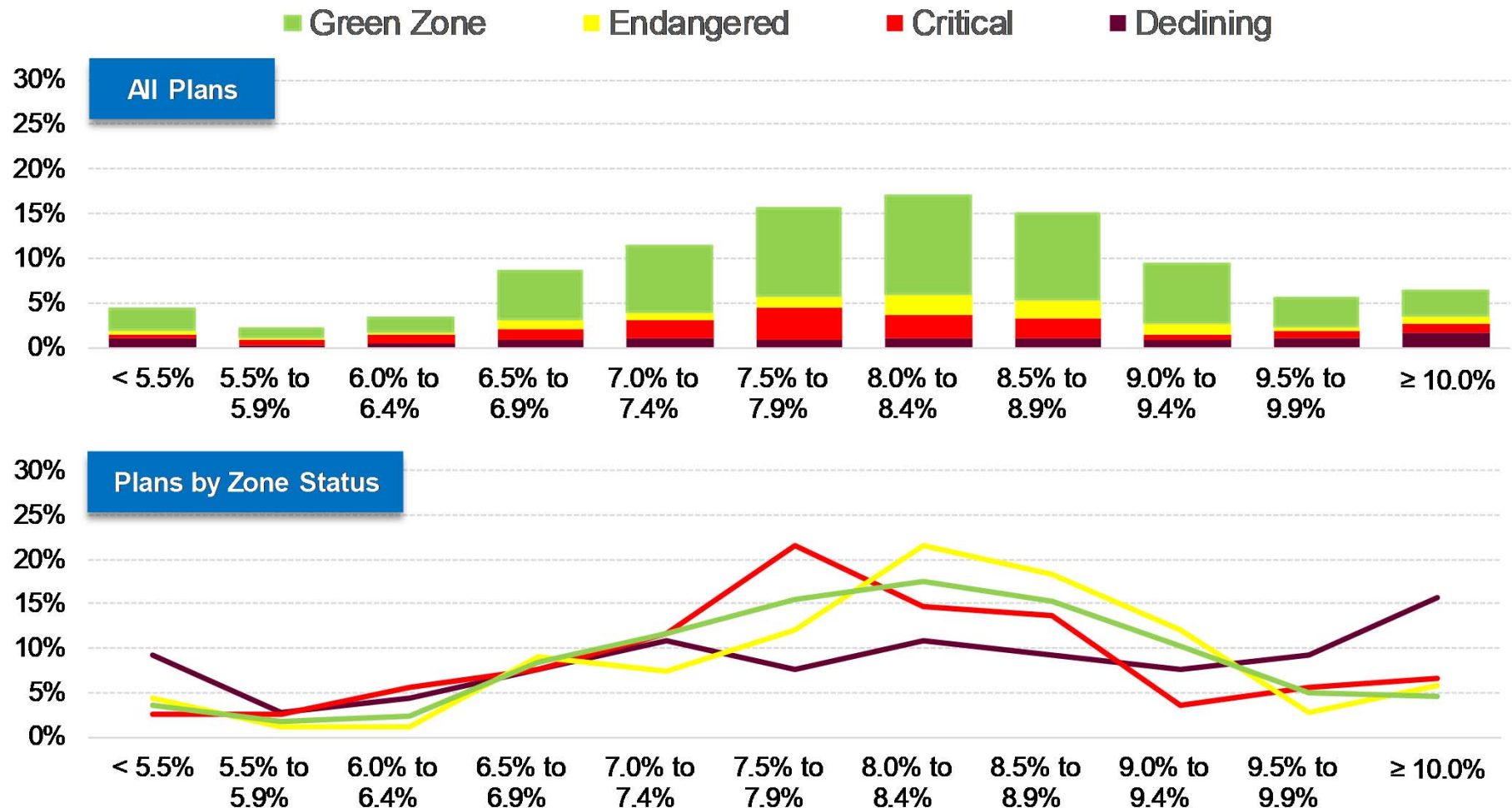
Source: Segal Consulting analysis of Form 5500 data for calendar plan years. Zone status applies to plan years ending in 2017.

Note: Annualized return includes market collapse of 2008.

Annualized Returns: 2012-2016

Calendar Year Plans Only

Distribution of Plans: Annualized Returns, 2012-2016 (5 Years)



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

Median Returns by Zone Status

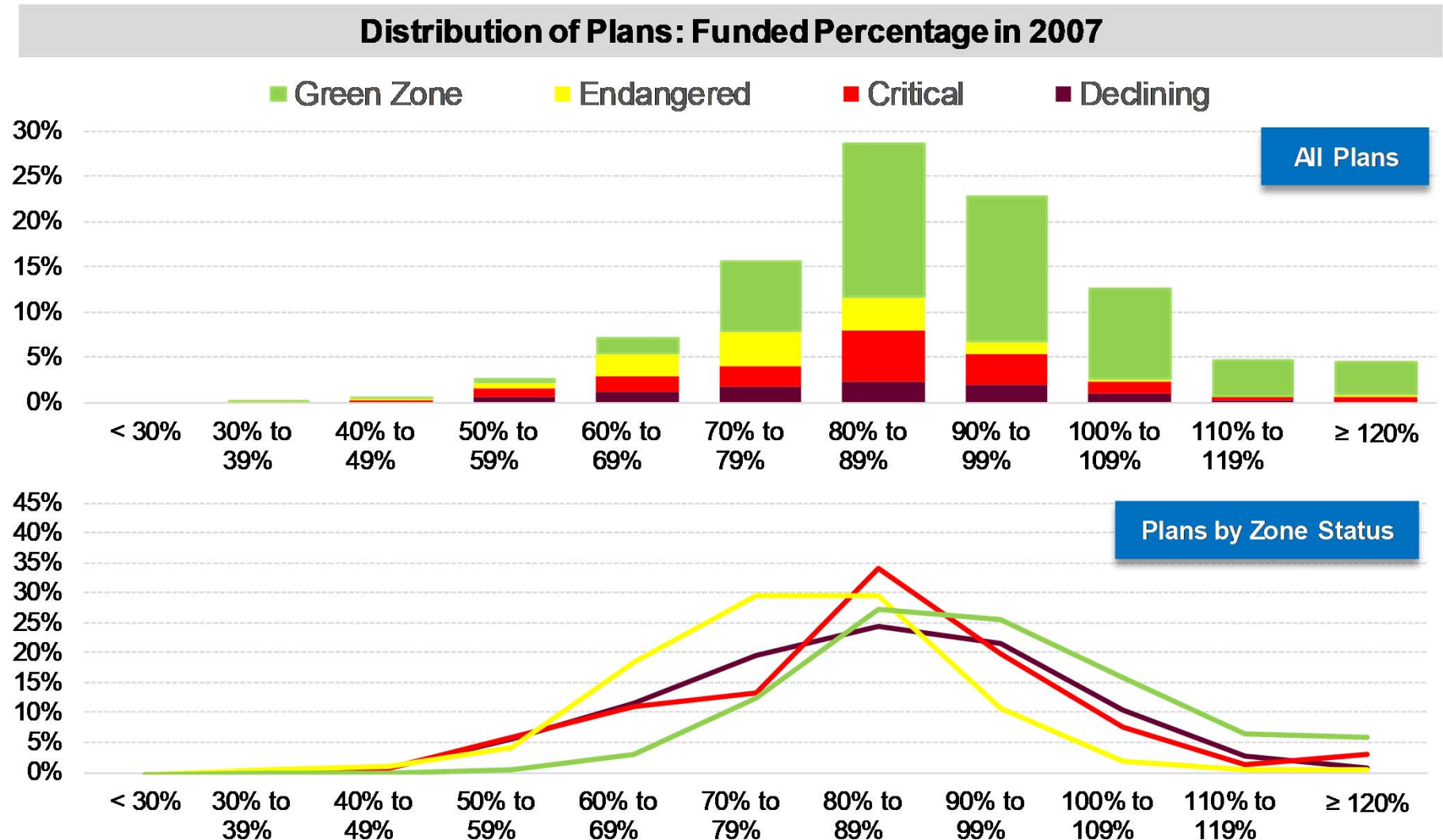
Median Annualized Investment Returns				
2017 Zone Status	Plan Count	2012-2016 (5 Years)	2007-2016 (10 Years)	2002-2016 (15 Years)
All Plans in Sample	627	8.1%	4.7%	5.3%
Green Zone	392	8.1%	4.8%	5.4%
Endangered	65	8.2%	4.5%	5.1%
Critical	105	7.9%	4.6%	5.2%
Declining	65	8.2%	4.5%	5.1%

No significant difference in median annualized investment returns over last 5, 10, and 15 years by PPA zone status. (Time periods are arbitrary.)

Notes

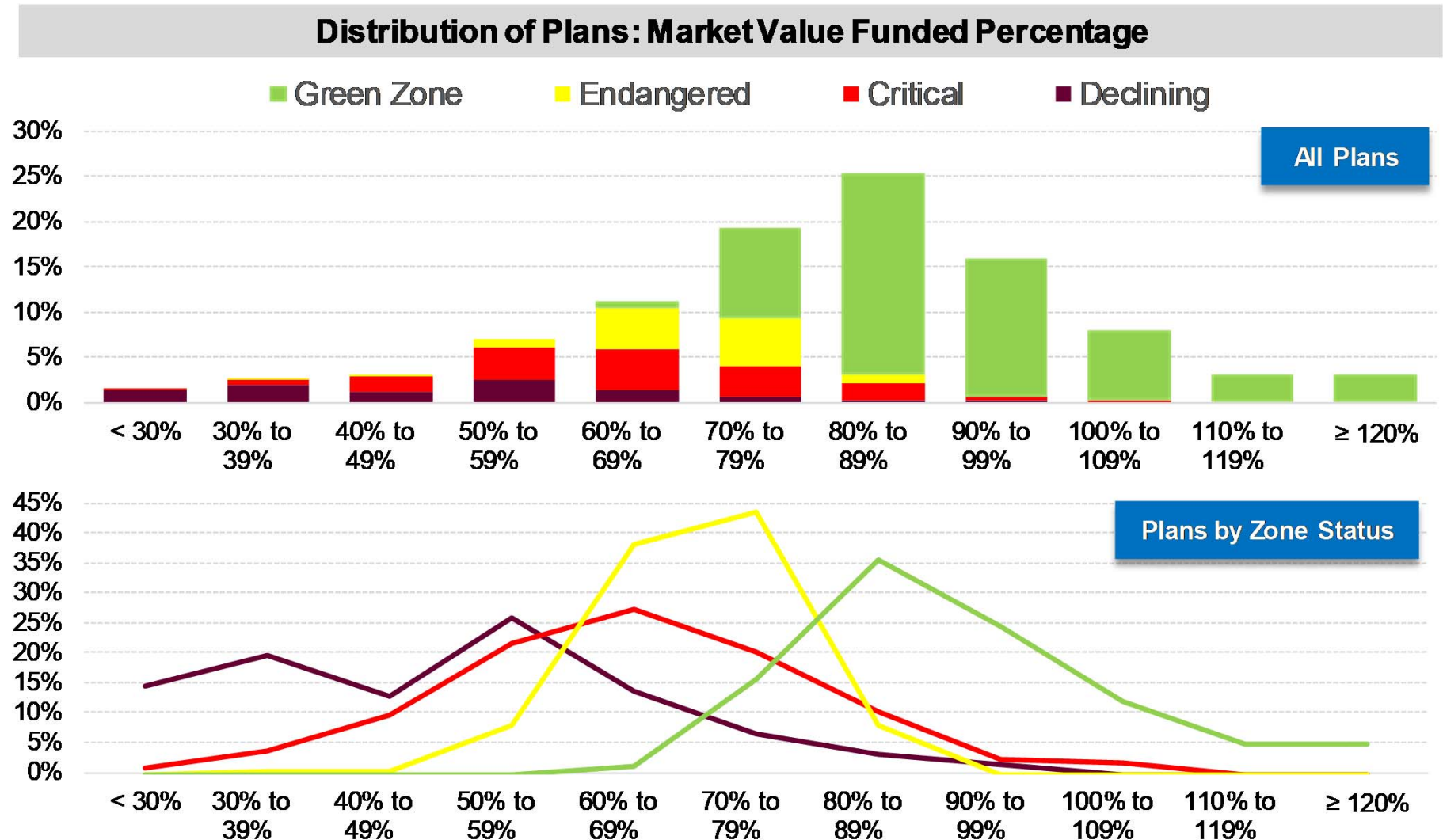
- Based on Form 5500 data for calendar plan years through 12/31/2016
- Analysis includes only calendar year plans with complete investment return data
 - Note that plans above represent a subset of the entire Multiemployer Universe
- Focus on investment returns from 2002 forward, due to availability of data
- Note that 10-year and 15-year annualized returns include 2008 financial market collapse

Plan Funding (2007)



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

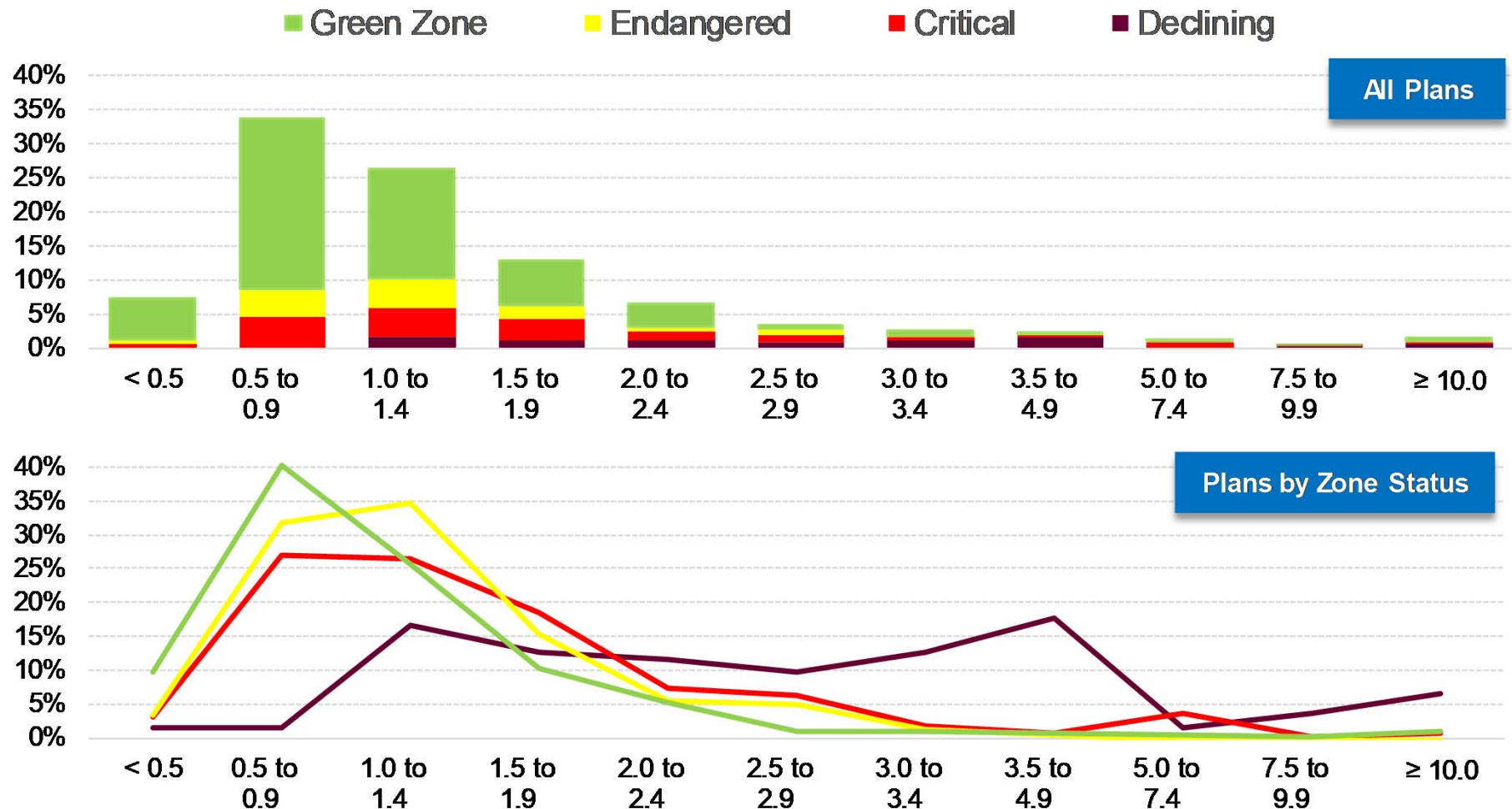
Plan Funding (2016)



Source: Segal Consulting analysis of Form 5500 data for plan years ending in 2016. Zone status applies to plan years ending in 2017.

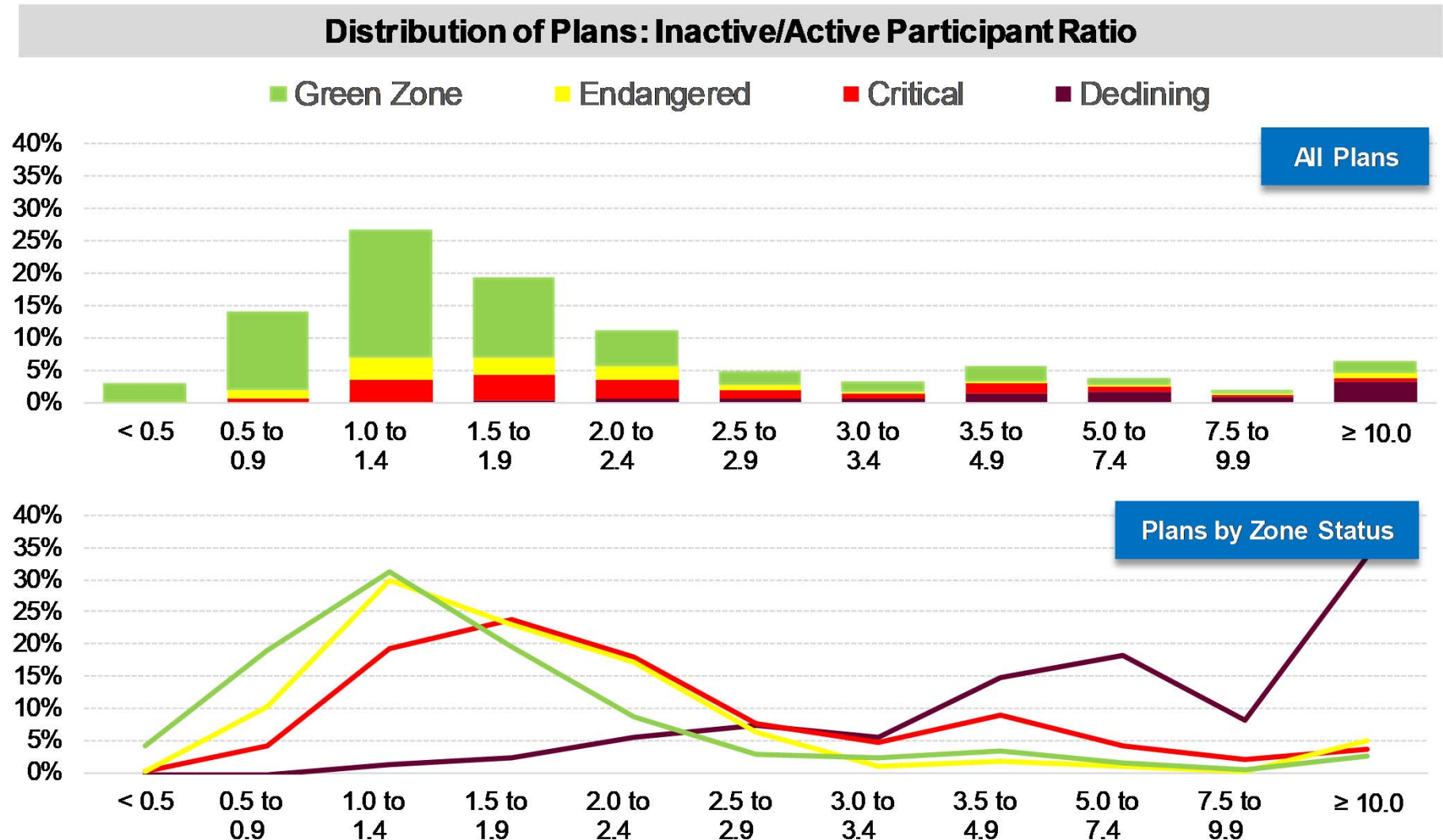
Plan Maturity (2007)

Distribution of Plans: Inactive/Active Participant Ratio in 2007



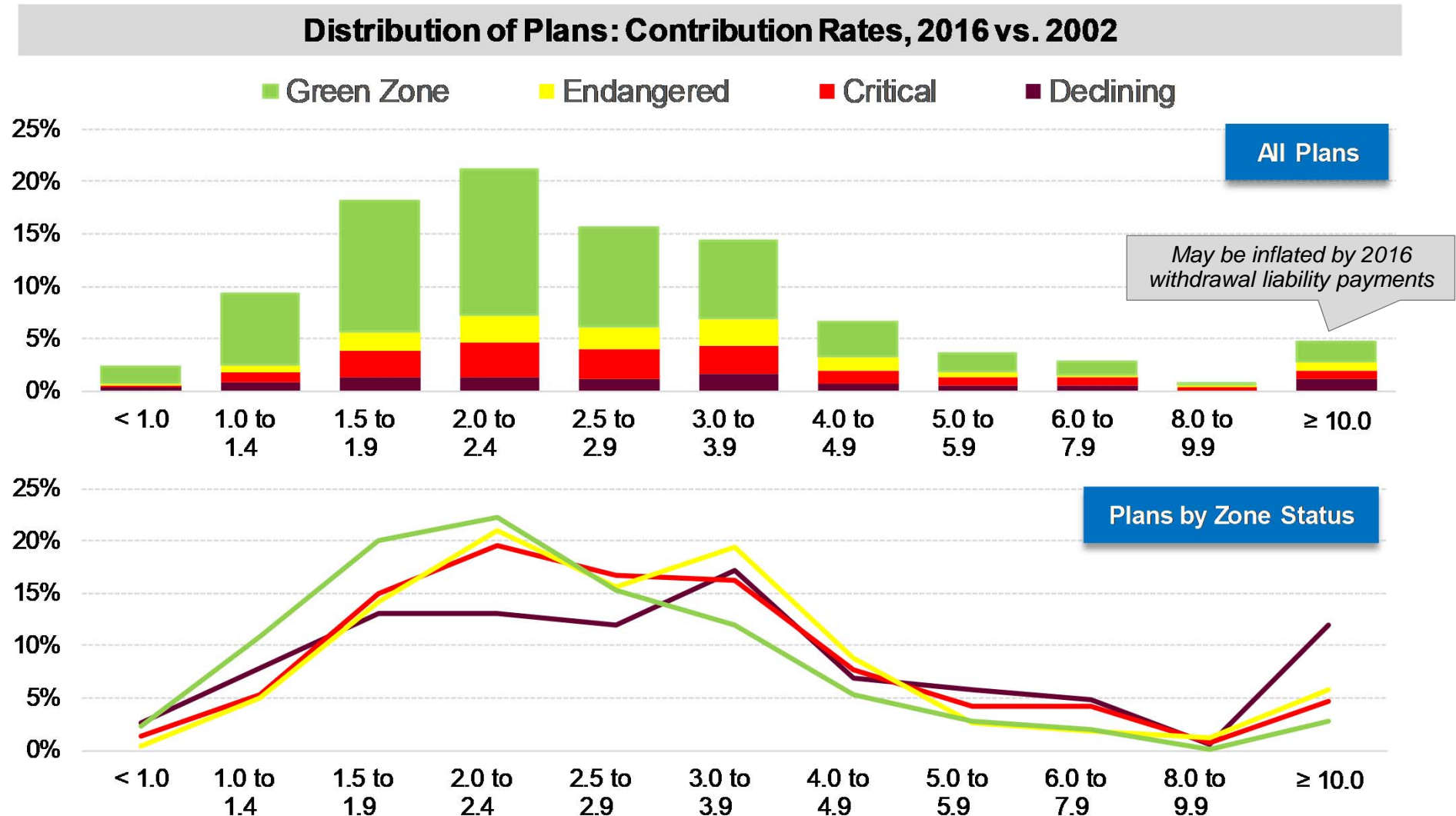
Source: Segal Consulting analysis of Form 5500 data. Zone status applies to plan years ending in 2017.

Plan Maturity (2016)



Source: Segal Consulting analysis of Form 5500 data for plan years ending in 2016. Zone status applies to plan years ending in 2017.

Contribution Rates: 2016 vs. 2002



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

For this purpose, "contribution rates" are the average contributions per active participant

Results by Zone Status: Then and Now

Median Results						
2017 Zone Status	Plan Count	Funded <u>Percentage</u>		Demographic <u>Maturity (I/A Ratio)</u>		Average <u>Contrib. Rates</u>
		2016 ←	2007	2016 ←	2007	2016 vs. 2002
All Plans	1,242	82%	88%	1.6	1.1	x 2.5
Green Zone	772	89%	92%	1.4	1.0	x 2.4
Endangered	149	70%	78%	1.6	1.2	x 2.7
Critical	203	65%	86%	2.0	1.4	x 2.7
Declining	118	51%	83%	6.3	2.6	x 3.0

Notes

- Based on Form 5500 data for plan years through 12/31/2016
- Compare against 2007 (pre-2008 financial crisis) for funded percentage and demographic maturity
 - Funded percentage = market value of assets over actuarial accrued liability at year-end
 - Demographic maturity = ratio of inactive participants to active participants
- Compare against 2002 (post-Dot Com Bubble burst) for increases in average contribution rates
 - Average contribution rate = contributions for plan year, divided by number of active participants
 - *Does not consider reductions in participant benefit levels that often accompanied rate increases*

Observations

➤ Interest rate assumptions

- Assumptions have changed, but not much
- Changing asset allocations may have played a role

➤ Drivers of current zone status

- Historical investment returns not significant
- Prior funding levels somewhat significant
- Prior and current demographic maturity *very significant*

➤ Plans have become more demographically mature

- Ratios of inactive to active participants have increased

➤ Further contribution increases may not be sustainable

- Contribution rates have already increased significantly in recent years
- Some plans may be able to sustain further increases, others may not
- *Note: analysis does not consider reductions in participant benefit levels*



Segal “Data” Publication:

*Appropriateness of Current Assumptions Used for
Funding Multiemployer Pension Plans*



Segal Study on Funding Assumptions

Segal “Data” Publication, July 2018

- Illustrates how low discount rates would be detrimental to healthy plans
- Focus on two well-funded national multiemployer plans
- Model impact of using different discount rate assumptions:

Discount Rate	Description
7.5%	Current assumption for both plans
5.5%	Similar to current mandated rates for single-employer plans, with “stabilization” relief
3.7%	Similar to what mandated rates for single-employer plans would be, without relief
3.0%	Similar to current liability rates, based on 30-year Treasury securities (also includes mandated mortality tables)

See key results on following slide.



Segal Study on Funding Assumptions *Continued*

Plan A	Current Rate	Possible Alternate Rates		
	7.5%	5.5%	3.7%	3.0%
Zone Status	Green	Yellow	Red	Red
Funded Status	97%	77%	60%	54%
Increase in Cost of Annual Benefit Accruals	N/A	48%	123%	166%
Year of Projected Funding Deficiency	N/A	N/A	2021	2021
Magnitude of Contribution-Rate Increase Required	N/A	Nearly double over 10 years	More than double over 5 years	Nearly triple over 5 years

Plan B	Current Rate	Possible Alternate Rates		
	7.5%	5.5%	3.7%	3.0%
Zone Status	Green	Red	Red	Red
Funded Status	105%	79%	58%	50%
Increase in Cost of Annual Benefit Accruals	N/A	58%	156%	216%
Year of Projected Funding Deficiency	N/A	2022	2019	2019
Magnitude of Contribution-Rate Increase Required	N/A	25% per year for 5 years	Double each year for 3 years	4-fold each year for 2 years



Comments? Discussion?

