AOFF Consulting

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Introduction

Actuarial Funding Valuation

1. Experience Study
2. Justification
3. Updated Assumption
4. Funding Target

Recommendation for Active Retirement Rates

Age	Current	New
55	5%	5%
56	5%	5%
57	5%	5%
58	5%	5%
59	5%	10%
60	10%	20%
61	10%	25%
62	20%	30%
63	30%	30%

Age	Current	New
64	40%	30%
65	100%	30%
66	100%	30%
67	100%	30%
68	100%	30%
69	100%	30%
70	100%	65%
71	100%	100%

Assumptions Review

Active Retirement Rates

Age	Rates
55	5%
56	5%
57	5%
58	5%
59	5%
60	10%
61	10%
62	20%
63	30%
64	40%
65	100%

Active Retirement Rates

Age	Rates
55	5%
…	…
60	10%
…	…

Mr. Switch, born in 2000

Age 60 in 2060

Retire in 2060 – 2061: 10%

Active Retirement Rates

$$\text{RATE} = \frac{\text{DECREMENTS}}{\text{EXPOSURE}}$$

(Retire at Age 60) ← EVENTS

(Age 60) ← TRIALS

	YEAR 2012	YEAR 2013	YEAR 2014	YEAR 2015	YEAR 2016
DECREMENTS	12	14	6	7	8
EXPOSURE	51	72	54	46	44

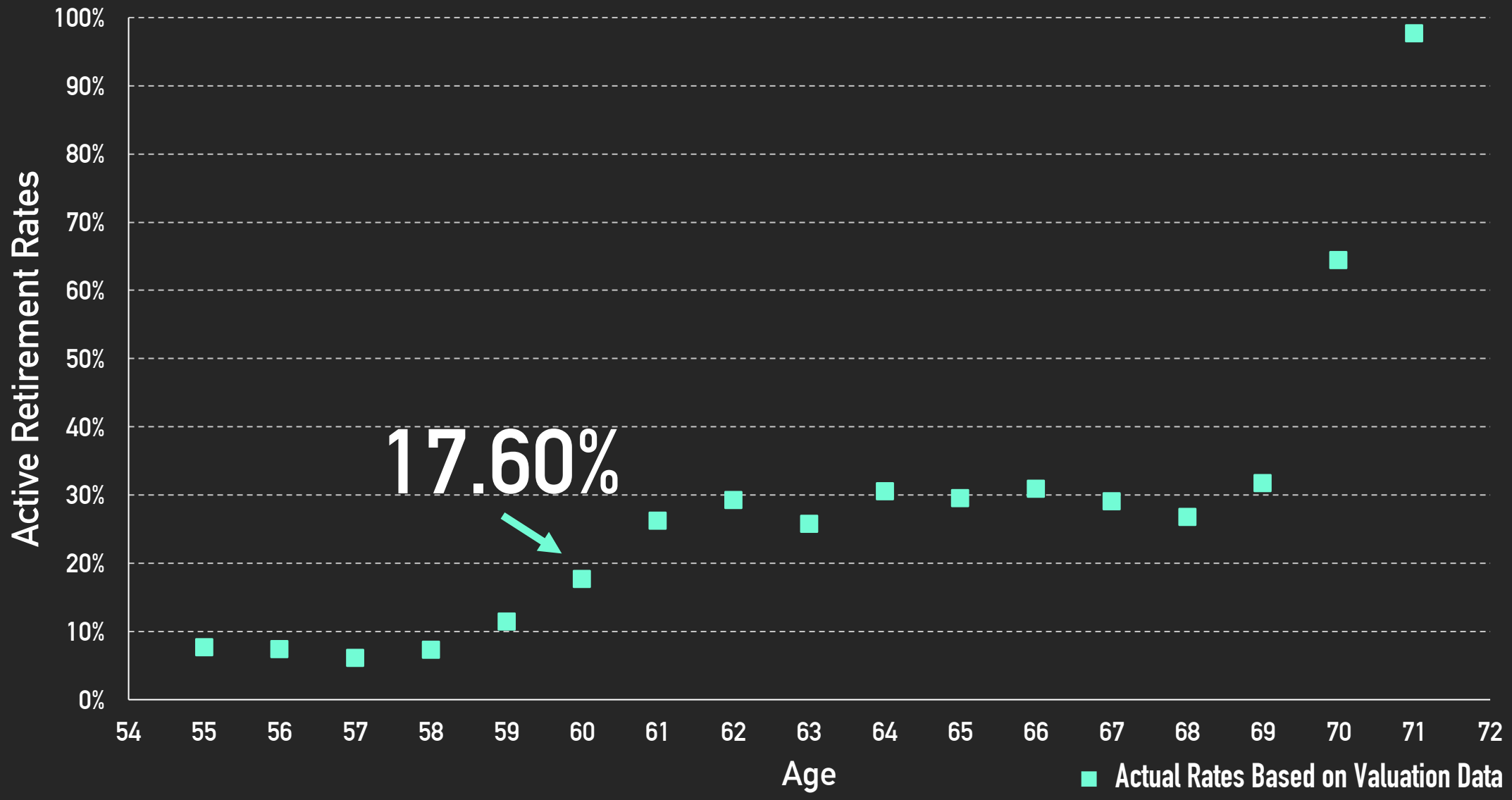
Active Retirement Rates

$$\text{RATE} = \frac{\text{DECREMENTS}}{\text{EXPOSURE}} \quad \begin{matrix} \#\text{ (Retire at Age 60)} \leftarrow \text{EVENTS} \\ \#\text{ (Age 60)} \leftarrow \text{TRIALS} \end{matrix}$$

	YEAR 2012	YEAR 2013	YEAR 2014	YEAR 2015	YEAR 2016
DECREMENTS	12	14	6	7	8
EXPOSURE	51	72	54	46	44

$$47/267 = 17.60\%$$

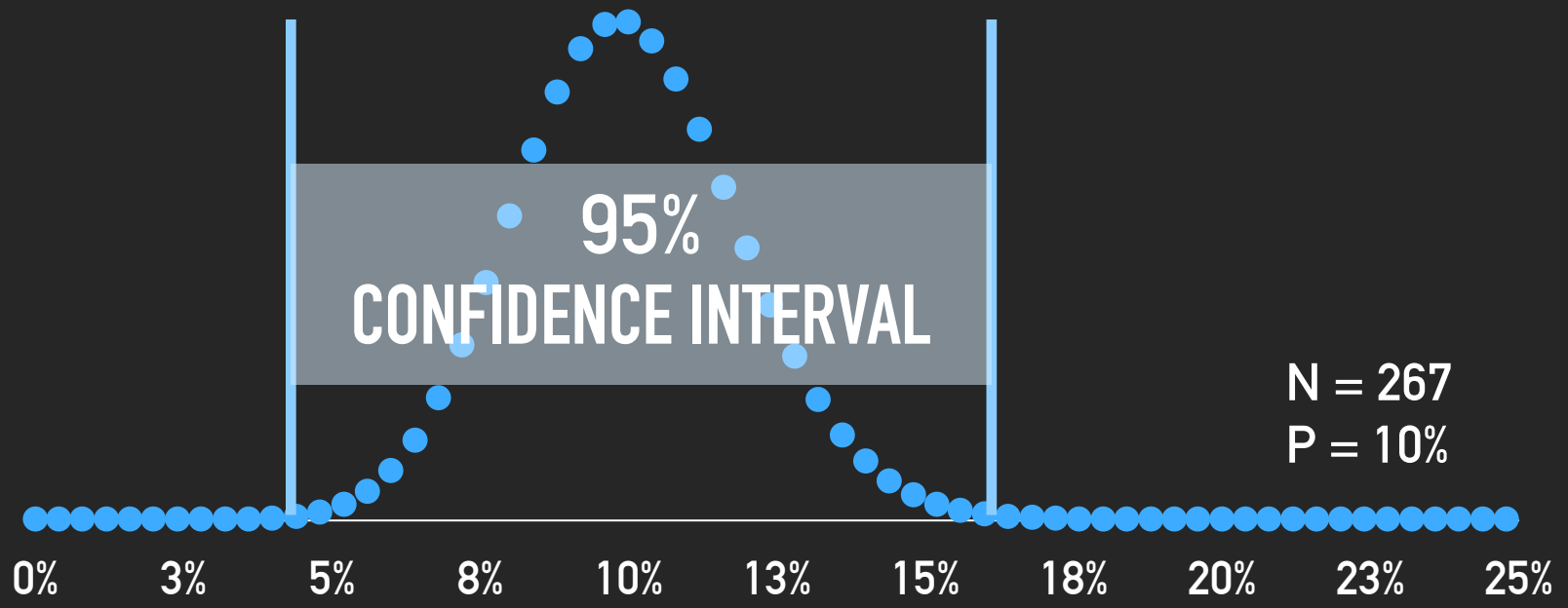
Active Retirement Rates Based on 2012-17 Valuation Data



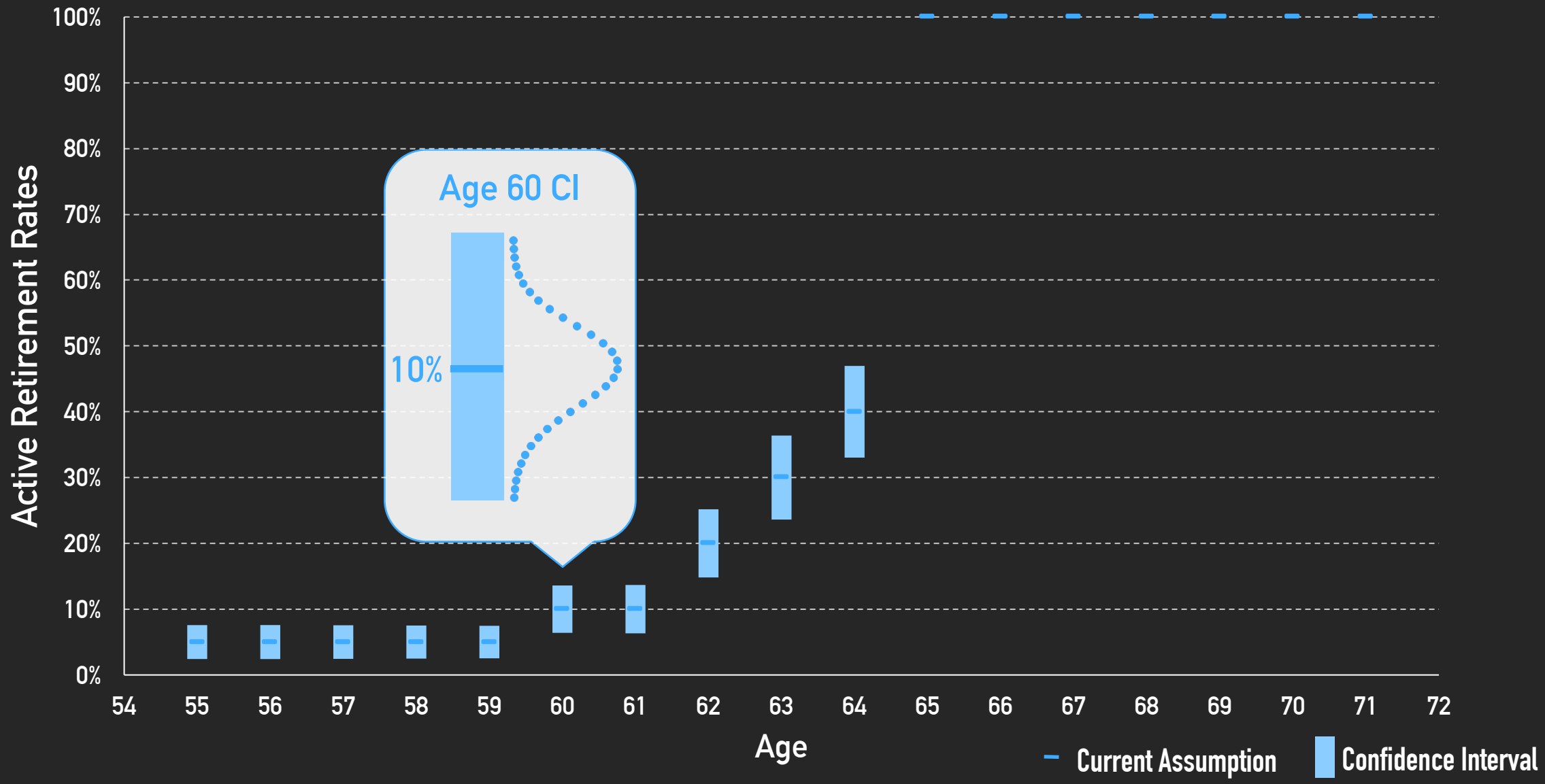
Active Retirement Rates

Sample Proportion → ESTIMATE → Population Proportion

Age	Rates
60	10%



Active Retirement Rates with 95% Confidence Interval Around Current Assumption



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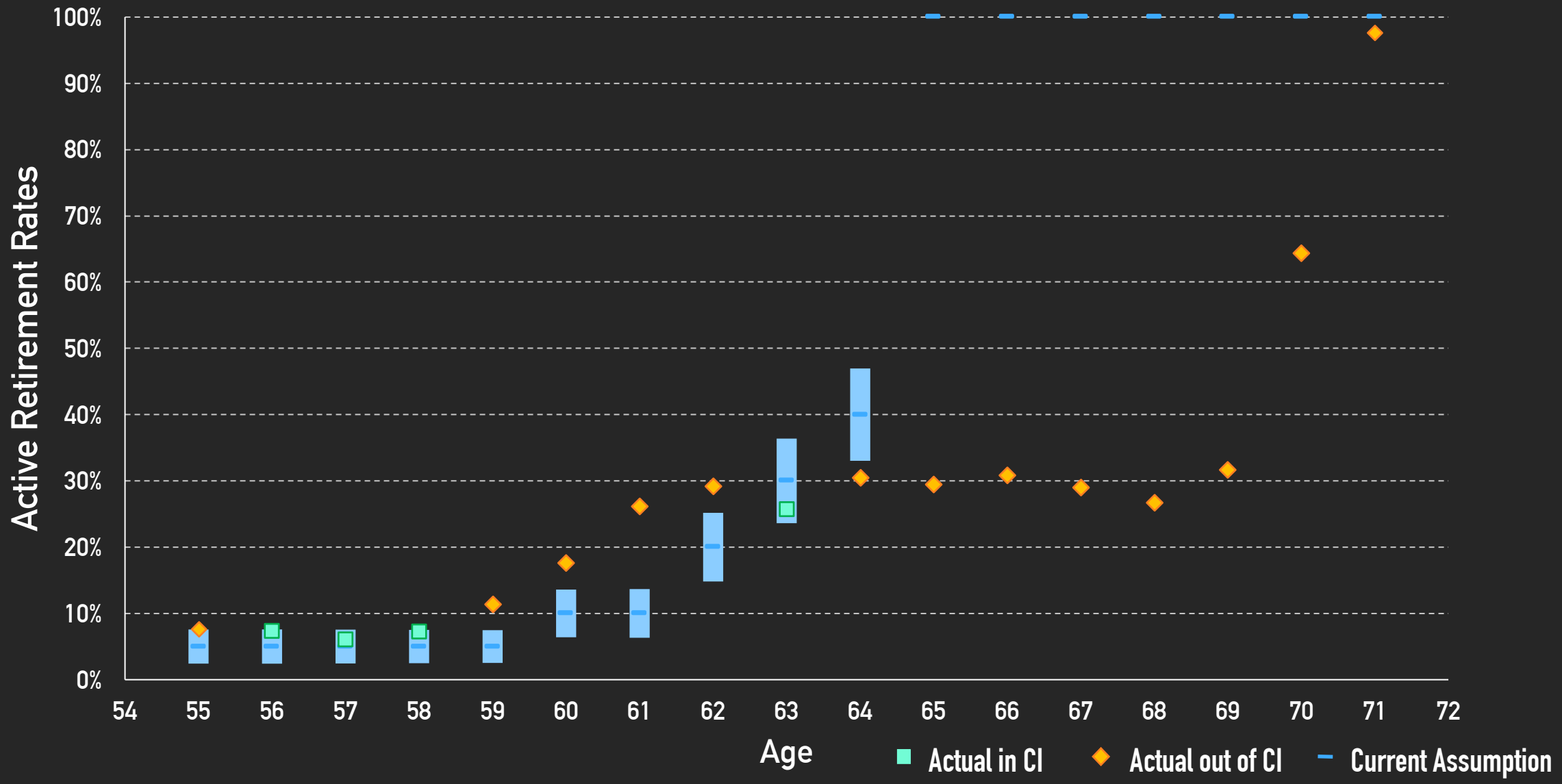
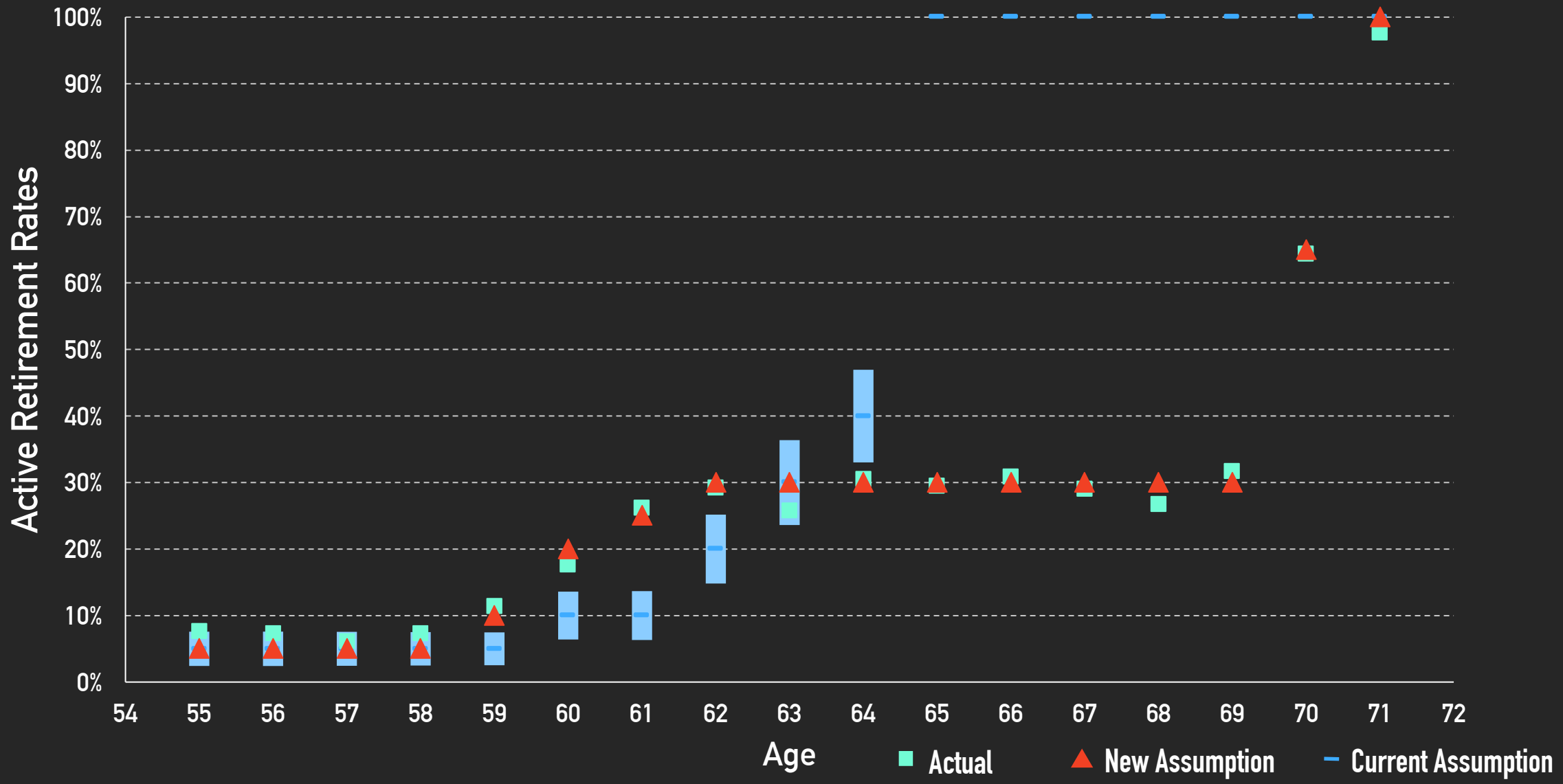
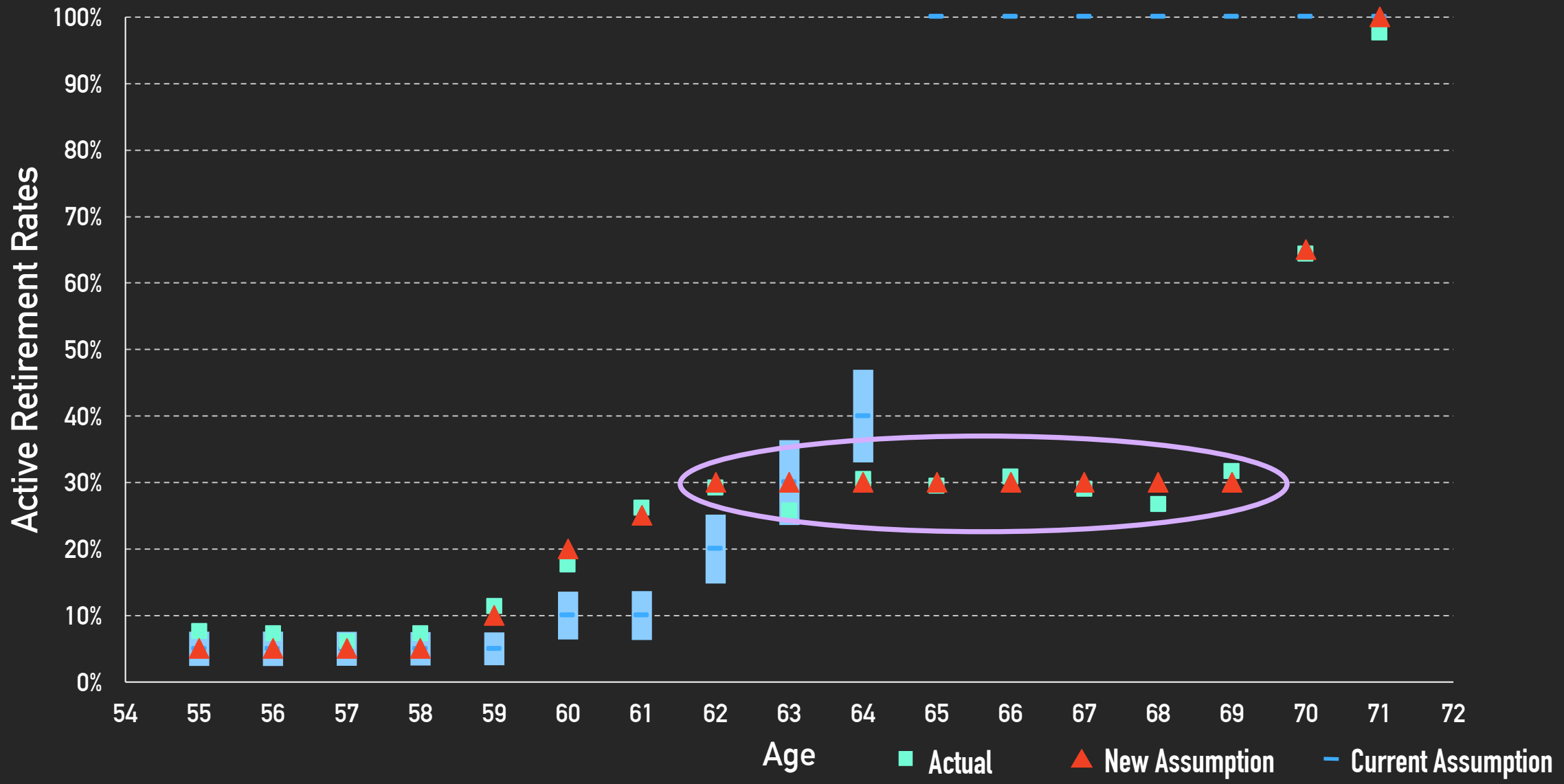


New Assumptions

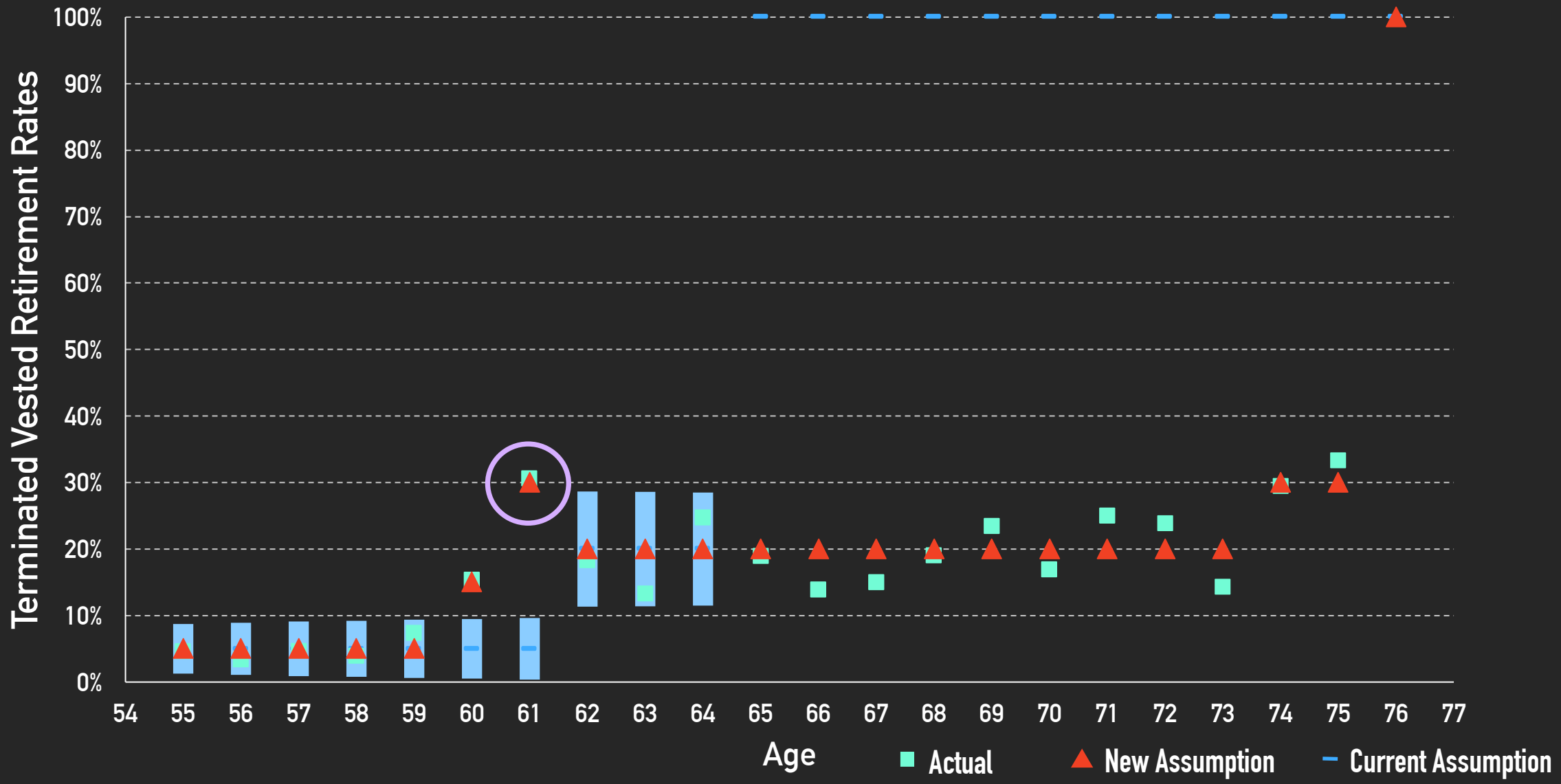
Active Retirement Rates



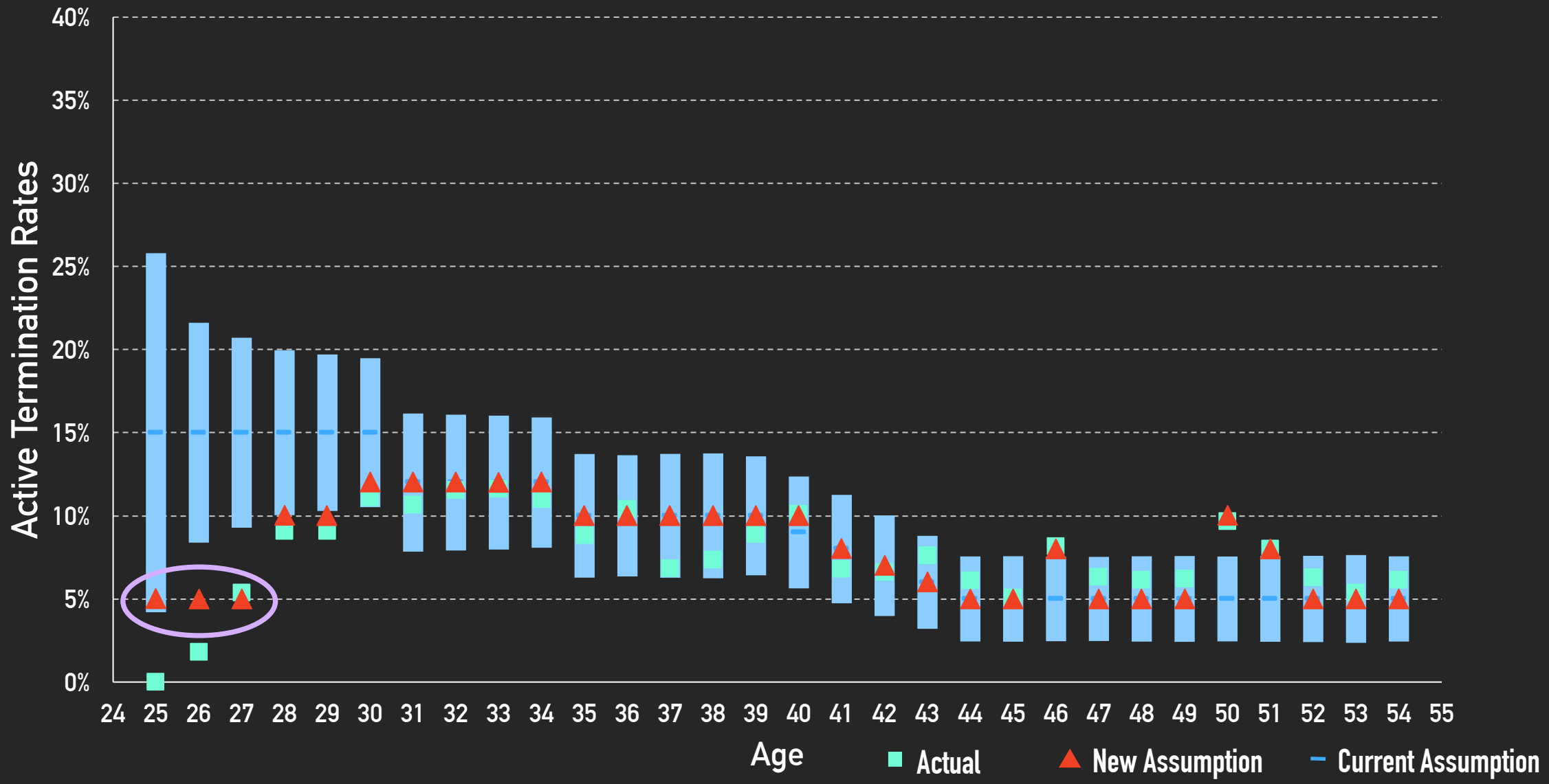
Active Retirement Rates



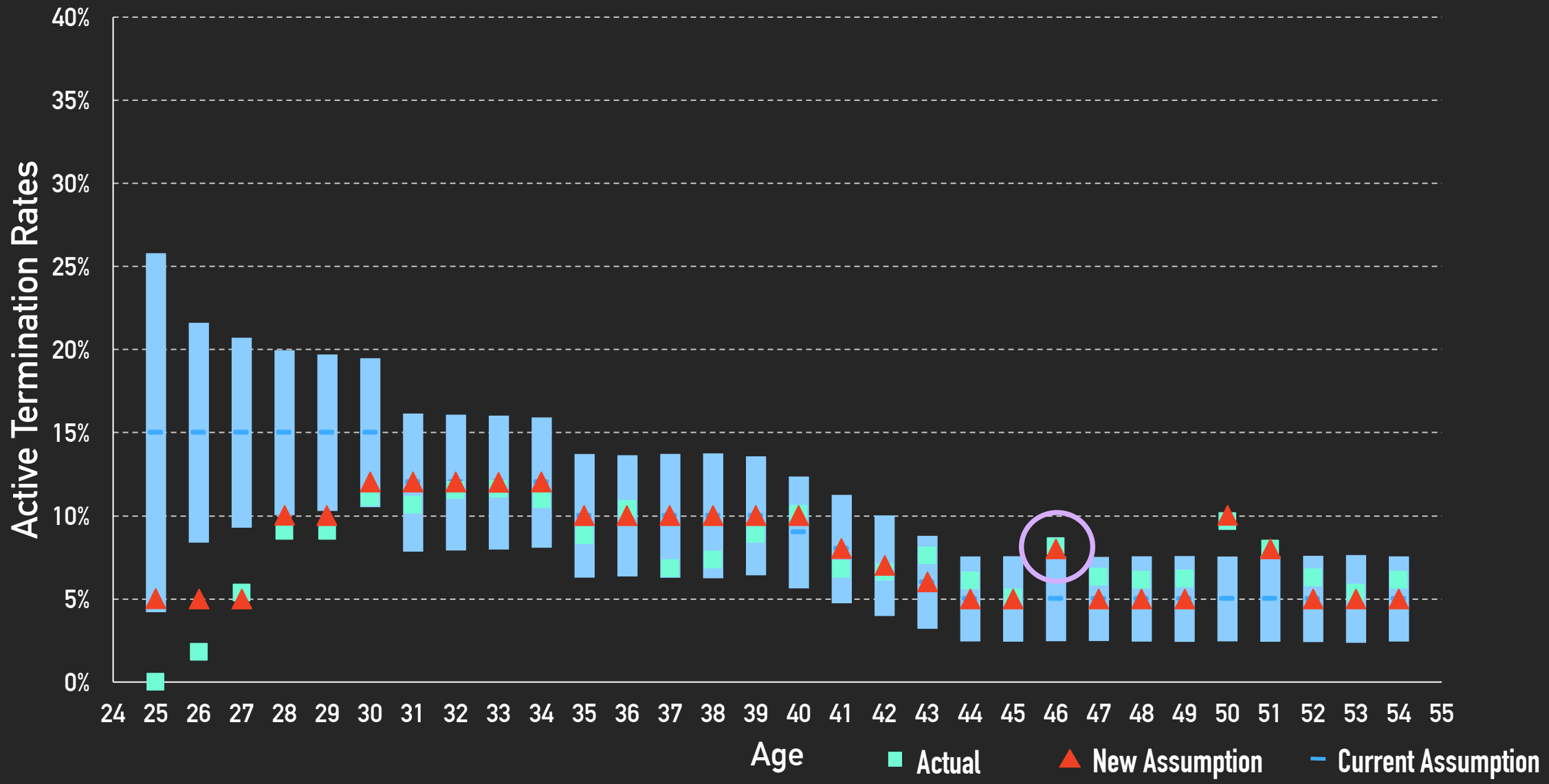
Terminated Vested Retirement Rates



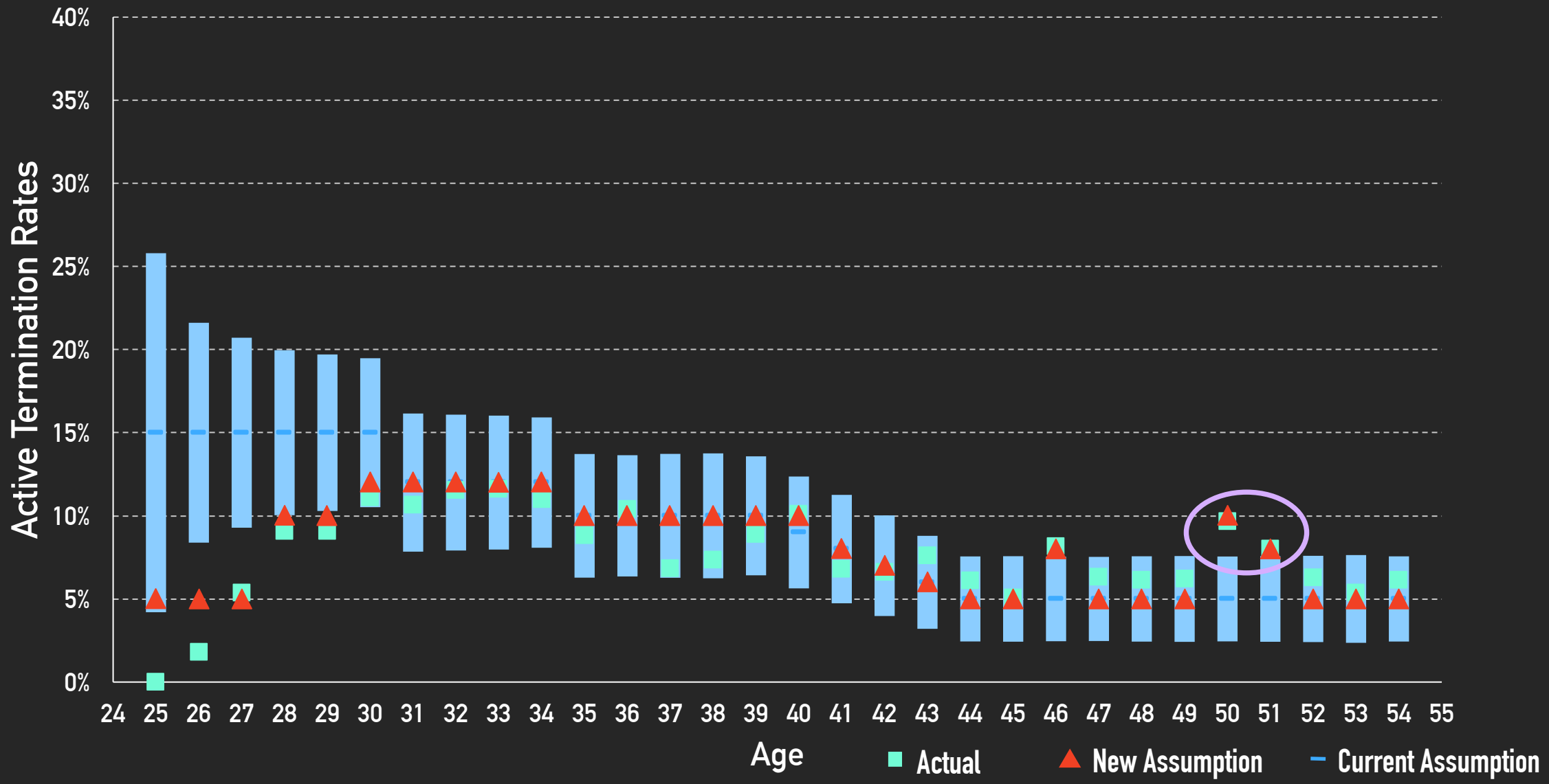
Active Termination Rates



Active Termination Rates



Active Termination Rates



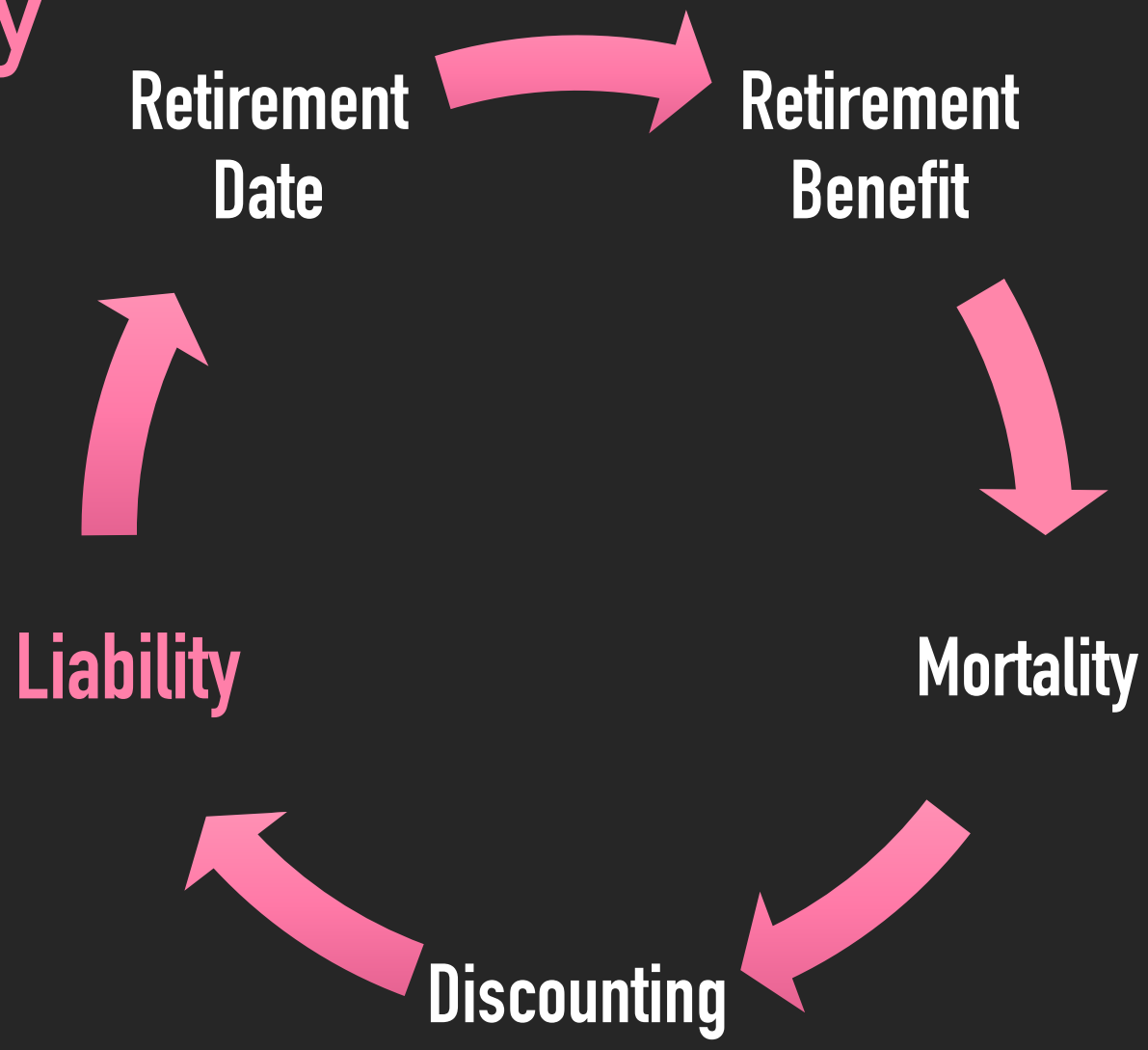
Liability

Types of Participants

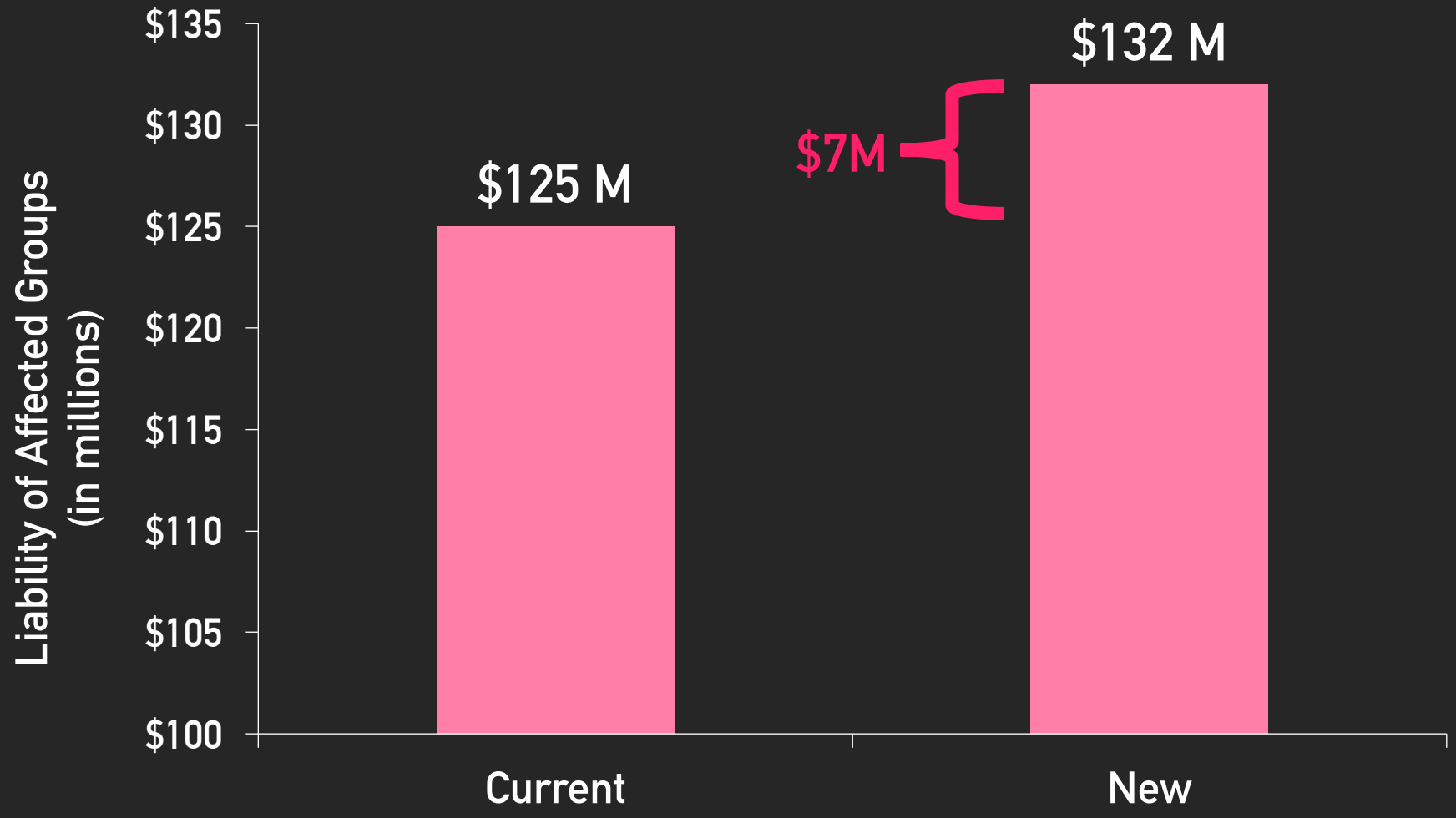
RETIRED	ACTIVE	TERMINATED
• Commenced Benefit	• Increase future liability	• Vested • Not vested

Application of Rates

Methodology



Change in Liability



Conclusion

Our Recommendation

- Extend the age range for retirement
- Update based on real-life experience

Ramification

- New retirement rates and termination rates
- Increase liability

Thank You

Appendix I

CONFIDENCE INTERVAL

$$\left(P - Z\sqrt{\frac{P(1-P)}{N}}, P + Z\sqrt{\frac{P(1-P)}{N}}\right)$$

Appendix II

Plan Provisions

- Annuity = $800 × Years of Service
- Retirement Age: normal 65, early 55
- Vesting: 100% after 5 years of service

Assumptions

- Pre-retirement rates
- Investment return: 7.5%
- Mortality: age 80

Appendix III

Present Value of Pension Payments for One Participant:

$$\$800 \cdot y_x \cdot a_{\overline{n}|} \cdot v^{2017-t}$$

where i: investment return

t: retirement year

x: age at t

y_x: average years of service for age x group

Appendix IV

Avg yrs of service	Age	Assumption rates	Active in '18	Still active '18	Act-ret '18	Liability
21.20	55	5%	44	42	2	$384,199
17.75	56	5%	41	39	2	$296,320
21.98	57	5%	33	32	2	$293,920
21.14	58	5%	38	36	2	$317,287
23.77	59	5%	48	46	2	$446,273
22.75	60	5%	47	44	2	$401,694
21.85	61	5%	34	32	2	$276,906
24.58	62	20%	24	19	5	$843,328
23.06	63	20%	21	17	4	$673,370
25.94	64	20%	14	12	3	$508,162
26.55	65	100%	4	0	4	$697,684