VM22 Deep Dive: From Baseline to Reserve Volatility

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What are the Fundamental Differences between VM-22 and AG33?

Area	AG33	VM-22
Liability assumptions	Conservative surrender and partial withdrawal. Mortality includes a 10% margin and significant historical MI	Company experience with explicit margins
Valuation discount rate	Prescribed discount rate	Modeled net asset return on each economic scenario with guardrails
Scenarios	Most conservative scenario	GOES conning scenarios
Margins	Implied conservative margins	Explicit
Regulator	NAIC	NAIC

VM-22 Methods

Total VM-22 reserve is the sum of stochastic reserves, deterministic reserves, and other reserves

FIA GLWB will fall under stochastic reserves

Components / formula	Approach	When does it apply?
Stochastic Reserve (SR)	CTE_{70} of stochastic scenario reserve results **Aggregation is limited to each reserving category, unless the liabilities are managed together**	Products with material market or policyholder behavior risk
+		
Deterministic Reserves (DR)	*Not expected to apply to FIA* Scenario reserve under a single economic scenario	Products with stable and predictable cash flows **Pass SST**
+		
Other Reserve	*Could apply to FIA accumulation (not GLWB)* Formula-based statutory reserves	Products excluded from PBR modeling and valued under VM-A / VM-C / VM-M / VM-V **Pass SET**
=		
Company Level VM-22 Aggregate Reserve (S3.A.)		

Stochastic Exclusion Test (SET)	Single Scenario Test (SST)
A company must pass **one** of the following: 1. Stochastic Exclusion Ratio Test (SERT) 2. Stochastic Exclusion Demonstration Test 3. SET Certification Method	A company must: 1. Certify that a) Cash flows are predictable and stable b) PH behavior not materially driven by economic conditions c) There is no material future hedging strategy 2. Pass a *modified* version of the SET

FIA GLWB reserve comparison of AG33 to VM-22

	Component	Benefit of VM-22	AG33	VM-22
A	**Surrender**	▲	None (not a binding condition)	Based on experience (plus prudent margin)
B	**Partial Withdrawals**	▲	Only income withdrawals (non-income are not binding)	Based on experience (plus prudent margin)
C	**Mortality**	▲	Conservative assumption	Based on experience (plus prudent margin)
D	**Discount Rate**	■	Prescribed valuation rates (based on a 3-year lag)	Based on actual investments (subject to limits)

Greatest present value of all income start points

Based on ALM runs under a range of economic scenarios

VM-22 reserves are expected to be lower than AG33 due to discounting based on actual asset yield and the company's own assumptions

Baselining Results

MYGA

Analysis powered by RiskAgility FM

Shift in 5-year UST influences renewal rates & lapses are a key driver of reserves

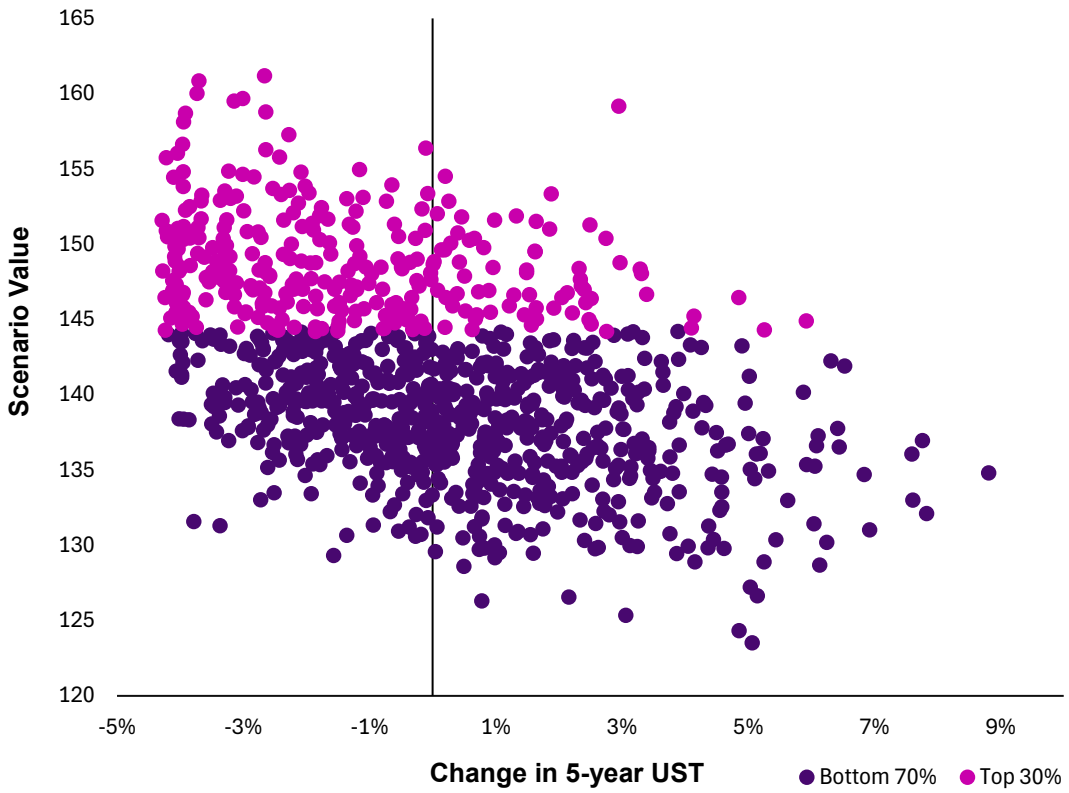
Results

Product	Premium	CSV	AG33 reserve	VM-22 reserve	% Change in reserve
MYGA 3	200.0	184.0	200.7	201.3	0.3%
MYGA 5	150.0	138.0	152.1	150.0	-1.4%
MYGA 7	150.0	138.1	154.4	148.8	-3.6%

Key observations

- Renewal rate strategies and persistency are key drivers
- Optimized investment strategy will help decrease rate sensitivity to GOES
- CTE 70 results are skewed towards a drop in rates, when the target spread can be squeezed
- Longer MYGA SCPs benefit from maximum net spread adjustment (MNSA) grade-in more so than shorter terms

7-Year MYGA: Change in 5-year UST (at issue to year 5)



Longer MYGA terms provide more time for MNSA grade-in process, increasing profitability and reducing reserves

FIA Accumulation

Analysis powered by RiskAgility FM

Similar to MYGA reserves will be defined by changes in interest rates

Results

Product	Premium	CSV	AG33 reserve	VM-22 reserve	% Change in reserve
FIA Accum	250.0	226.6	235.0	226.6	-3.6%

CTE 70: 217.9

Key observations

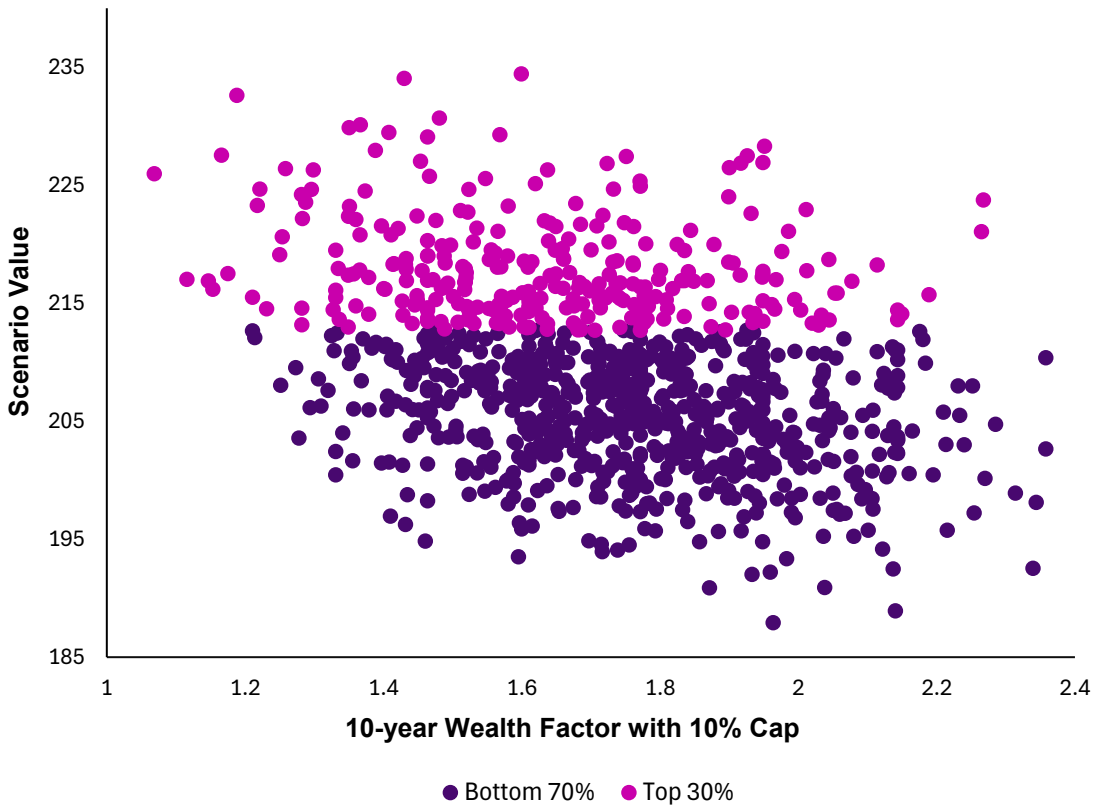
FIA Accumulation results are driven by the impact of equity returns and interest rates

As a spread-based product, higher equity performance leads to more assets under management (AUM) and profits, assuming asset yields are sufficient (shown on the right)

Lower equity performance exposes the company to Guaranteed Minimum Surrender Value (GMSV) requirements

ALM and understanding policyholder behavior assumptions and dynamics are key to achieving reserve optimization

Year 10 Cumulative AV Growth with 10% Cap



Higher equity returns are highly correlated with lower reserves

FIA Income

Analysis powered by RiskAgility FM

Reinvestment by scenario is a key driver of reserves

Results

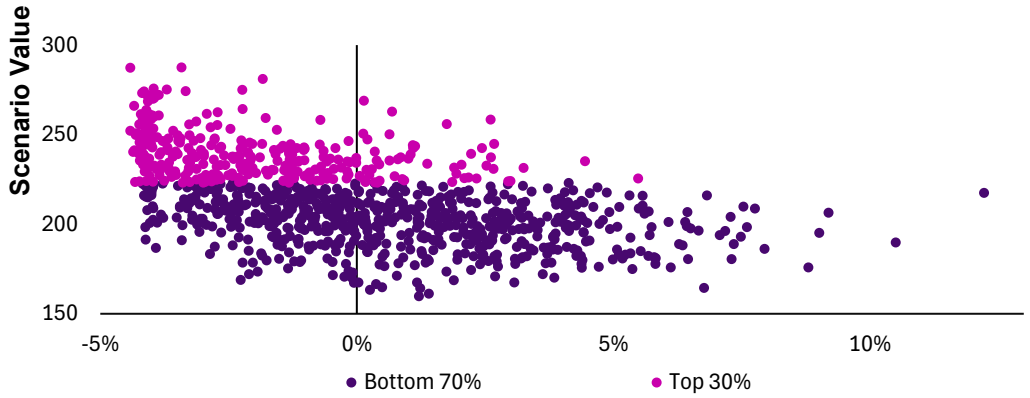
Product	Premium	CSV	AG33 reserve	VM-22 reserve	% Change in reserve
FIA Income	250.0	227.3	268.0	239.6	-10.6%

Key observations

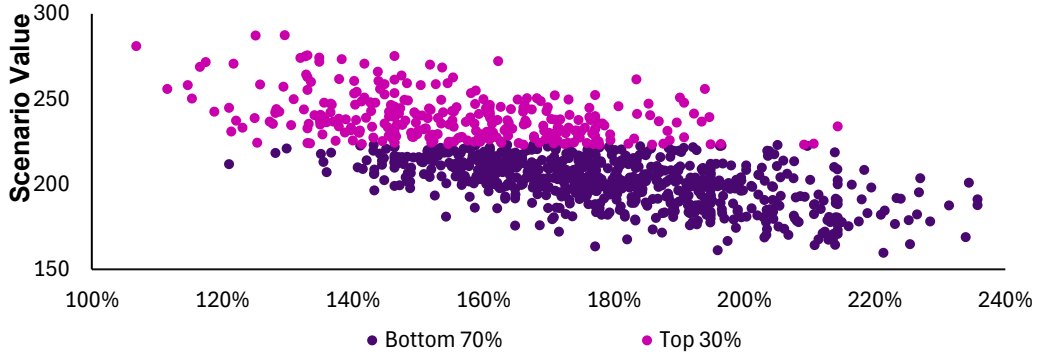
The results are more variable than accumulation products as they are driven by additional policyholder behavior options and the addition of longevity risk.

Increasing rate scenarios drive up the NAER and option budgets and when combined with strong equity growth, WB claims are lower, which leads to lower GPVADs / lower VM-22 reserve.

Change in 5-year UST (at issue to year 10)



Year 10 Wealth Factor with 10% Annual Cap



Increased reinvestment rates reduce deficiencies and reserves under VM-22

Impact of Asset Duration

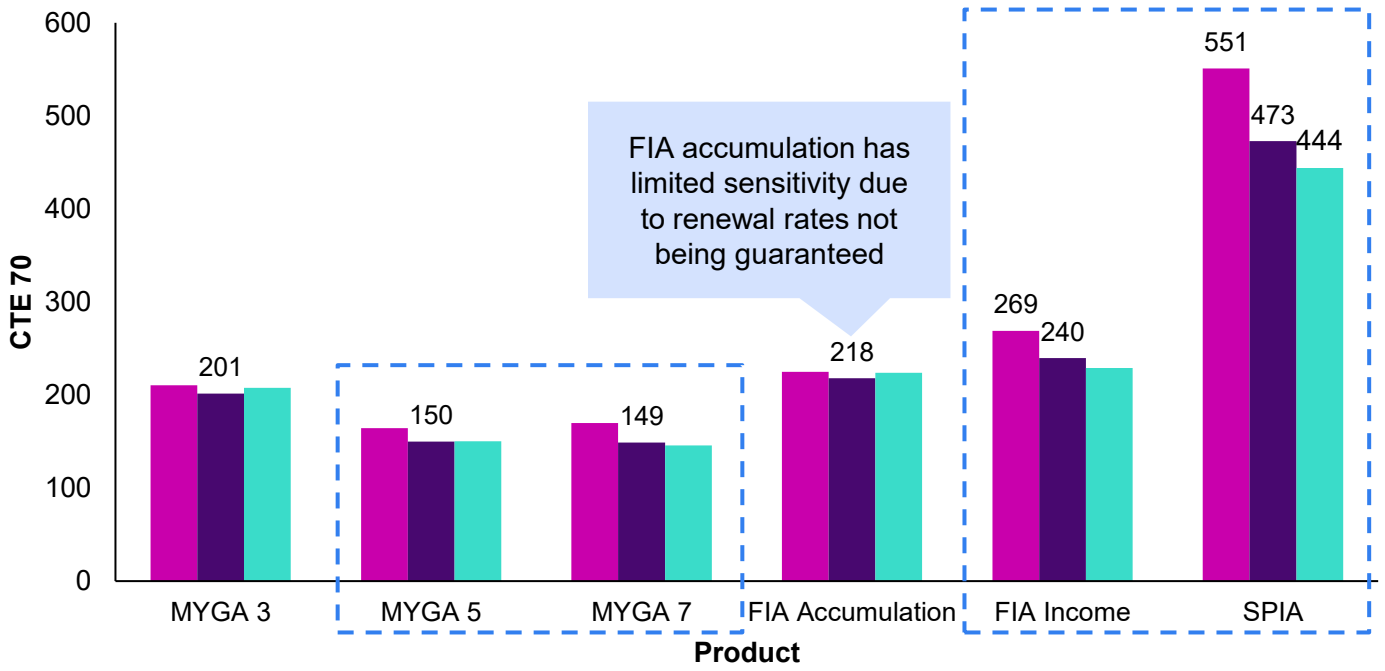
Summary of Results ($M)

Results shown are highly driven by the scenario set

Analysis powered by RiskAgility FM

Background of analysis:
WTW performed an independent analysis of VM-22 reserves under shorter (Short) and longer (Long) asset durations in the initial investment portfolio for MYGA, FIA accumulation, FIA income and SPIA products. The baseline strategy is based on a simple initial investment portfolio, where the asset tenor is based on the surrender charge period (SCP) or liability duration. The results are as of 12/31/2024 and market rates reflect those offered for the top 25% percentile of competitiveness.

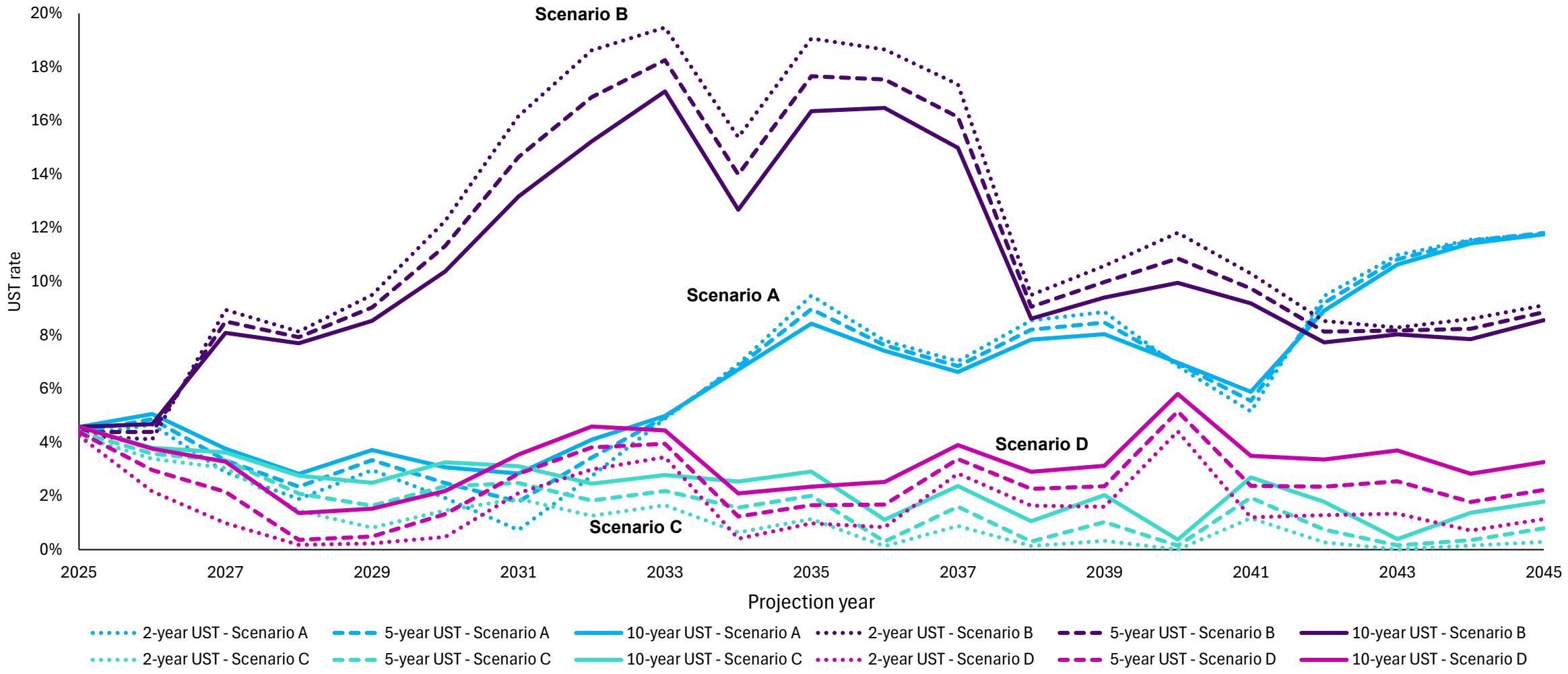
Product	Premium	CSV	AG33
MYGA 3	200	184	203
MYGA 5	150	138	154
MYGA 7	150	138	157
FIA Accumulation	250	227	235
FIA Income	250	227	268
SPIA	500	NA	517



Longer dated guaranteed rate products have significant sensitivity to the duration of the asset strategy

Scenarios A through D

A range of scenarios are represented in the analysis



MYGA5

Results shown are highly driven by the scenario set

Analysis powered by RiskAgility FM

Short strategy leads to materially higher reserves under a range of interest rate changes

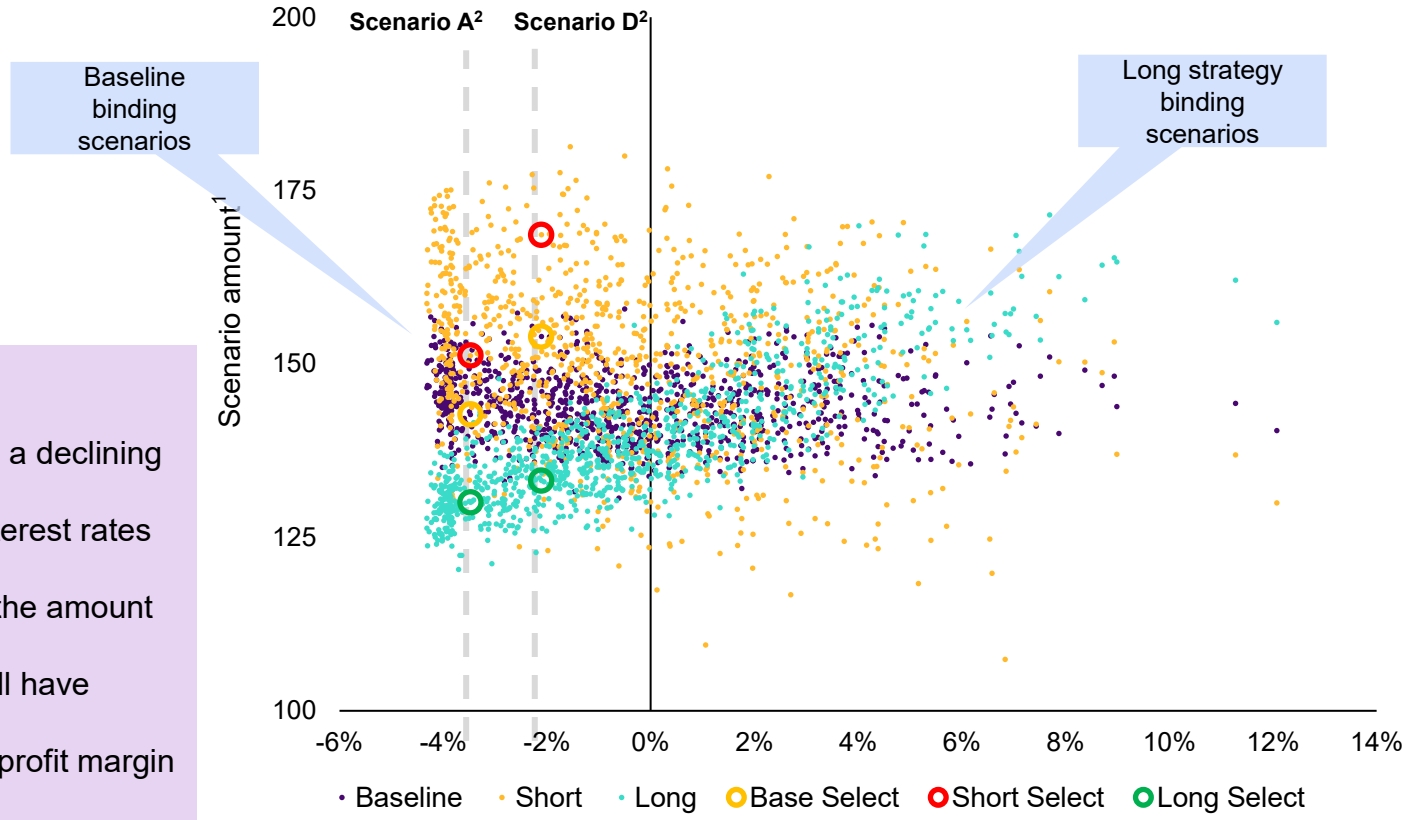
CTE 70 by asset strategy

Short	164
Baseline	150
Long	150

Observations

- Long asset strategy provides much lower scenario amounts in a declining interest rate scenario
  - Credited rates after the SCP will be based on higher interest rates than the prevailing competitor rate[3]
  - Dynamic lapses will decrease lapsation and maintains the amount earning the product spread for a longer period
- Under Increasing interest scenarios the long asset strategy will have higher scenario amount and more likely to be binding due to
  - Dynamic lapse increases resulting in decreased future profit margin
  - Assets sold at a loss

Δ 2-year UST from issue to duration 6



CTE 70 for the baseline and long strategy are similar, driven by opposite binding scenarios

1. Scenario amount is the total asset requirement for the specific scenario, or greatest present value of accumulated deficiencies (GPVAD)
2. Scenarios are deep dived in the appendix
3. Competitor rates are the credited rates offered by competitor companies in the scenario

FIA Accumulation (1/2)

Results shown are highly driven by the scenario set

Analysis powered by RiskAgility FM

Asset strategies disconnected from liability duration results in reinvestment / disintermediation risk

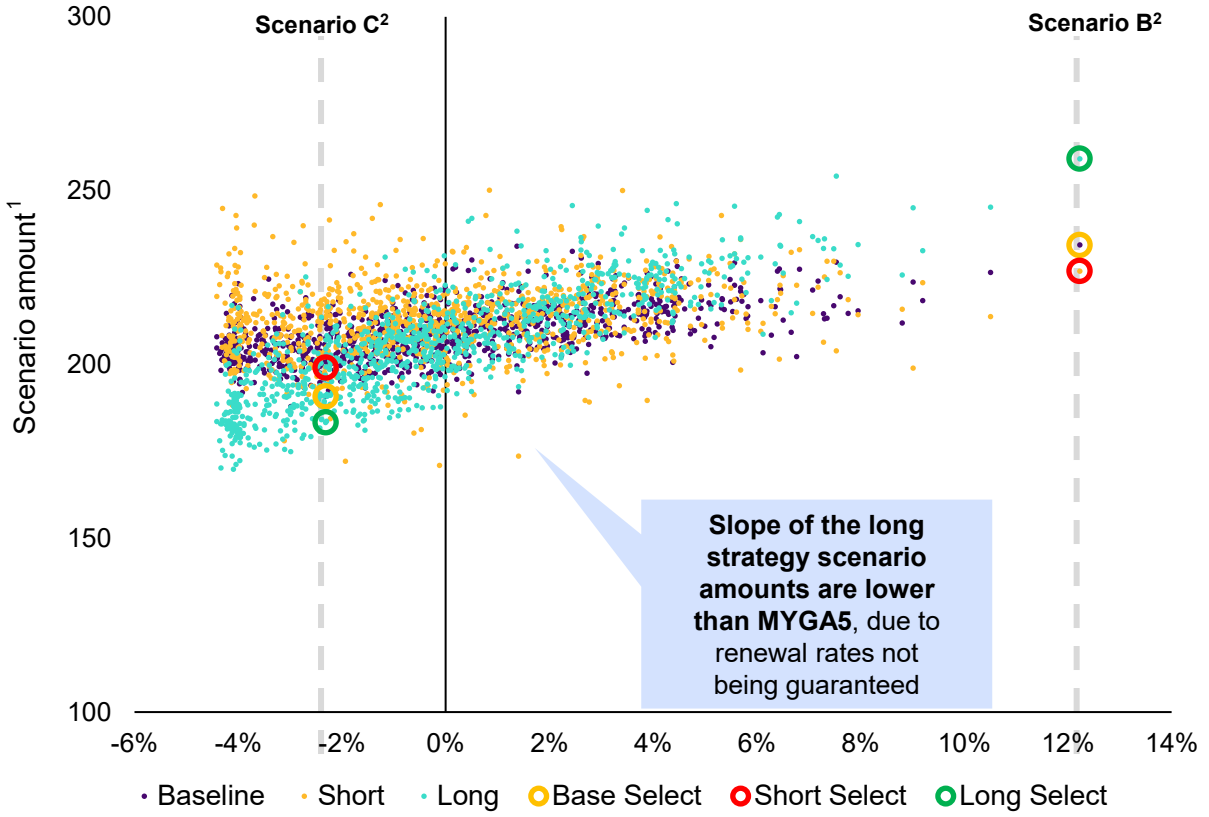
CTE 70 by asset strategy

Short	225
Baseline	218
Long	224

Observations

- While the scenario amount pattern across the short and long strategies are similar to that observed in MYGA5, there is less dispersion due to renewal rates not being guaranteed.
  - Unlike MYGA5, the long scenario amount shows an increase from baseline due to the longer surrender charge period (more frequent high-interest rate scenarios later in the projection)
  - 100 scenarios (of 1,000) have a change in rates of 4% or more at year 10, versus 80 scenarios have a change in rates of 4% or more at year 5.
- Short strategy scenario amount slope is similar to baseline

Δ 5-year UST from issue to duration 10



Baseline asset strategy provides a reasonably stable scenario amount across the scenario set

1.Scenario amount is the total asset requirement for the specific scenario, or greatest present value of accumulated deficiencies (GPVAD)
2.Scenarios are deep dived in the appendix

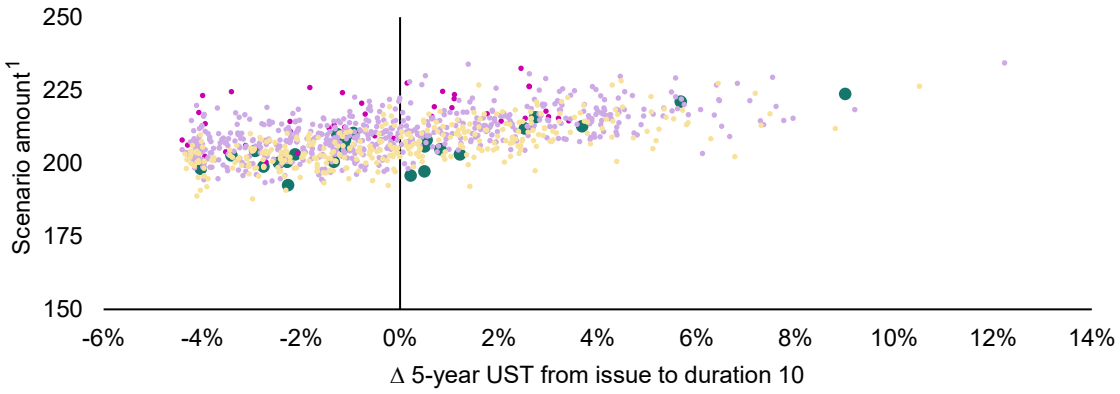
FIA Accumulation (2/2)

Results shown are highly driven by the scenario set

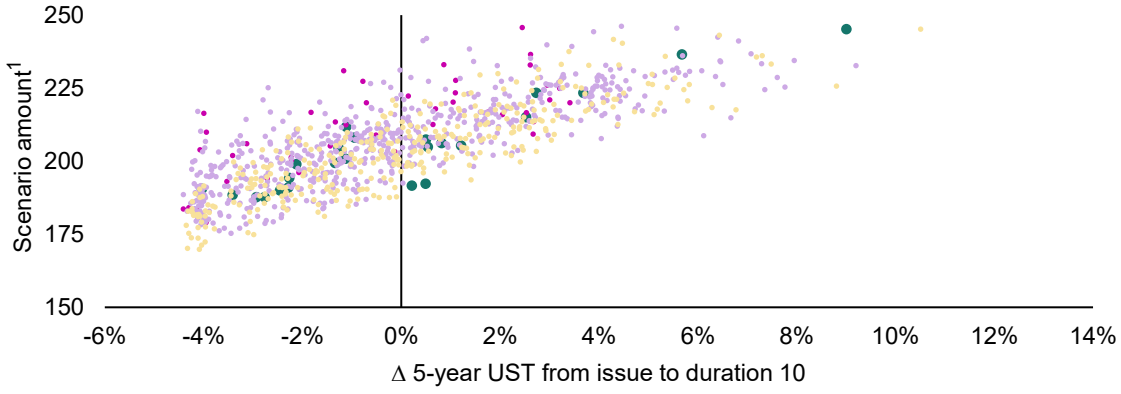
Analysis powered by RiskAgility FM

Higher equity scenarios are strongly correlated with lower scenario amounts

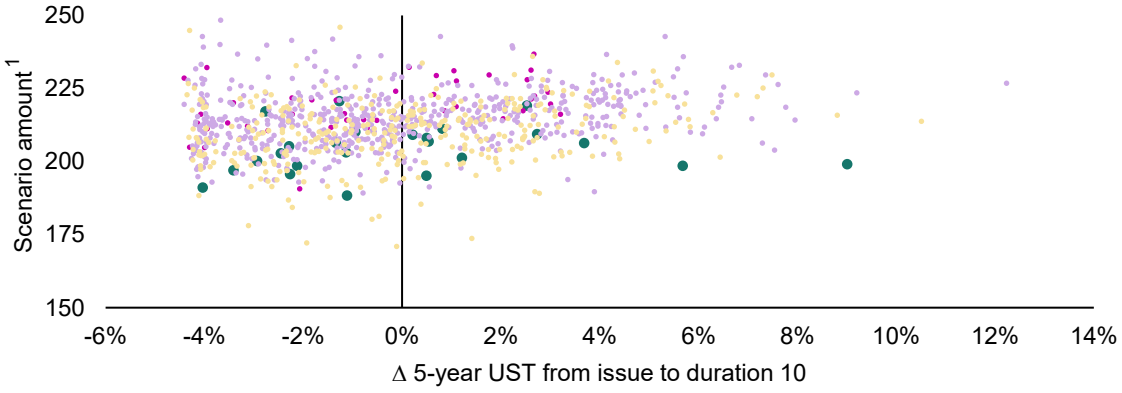
Baseline



Long



Short



Observations

- Equity return correlation is maintained across asset strategies

Equity return legend	High	Medium-high	Medium-low	Low
	8%+	6-8%	3-6%	3% or less

Equity return defined as 1-year S&P500 10% cap with geometric average of the first 10 projection years

1.Scenario amount is the total asset requirement for the specific scenario, or greatest present value of accumulated deficiencies (GPVAD)

FIA Income (1/2)

Results shown are highly driven by the scenario set

Analysis powered by RiskAgility FM

Shorter assets strategies increase scenario amounts due to a bias toward decreasing rates

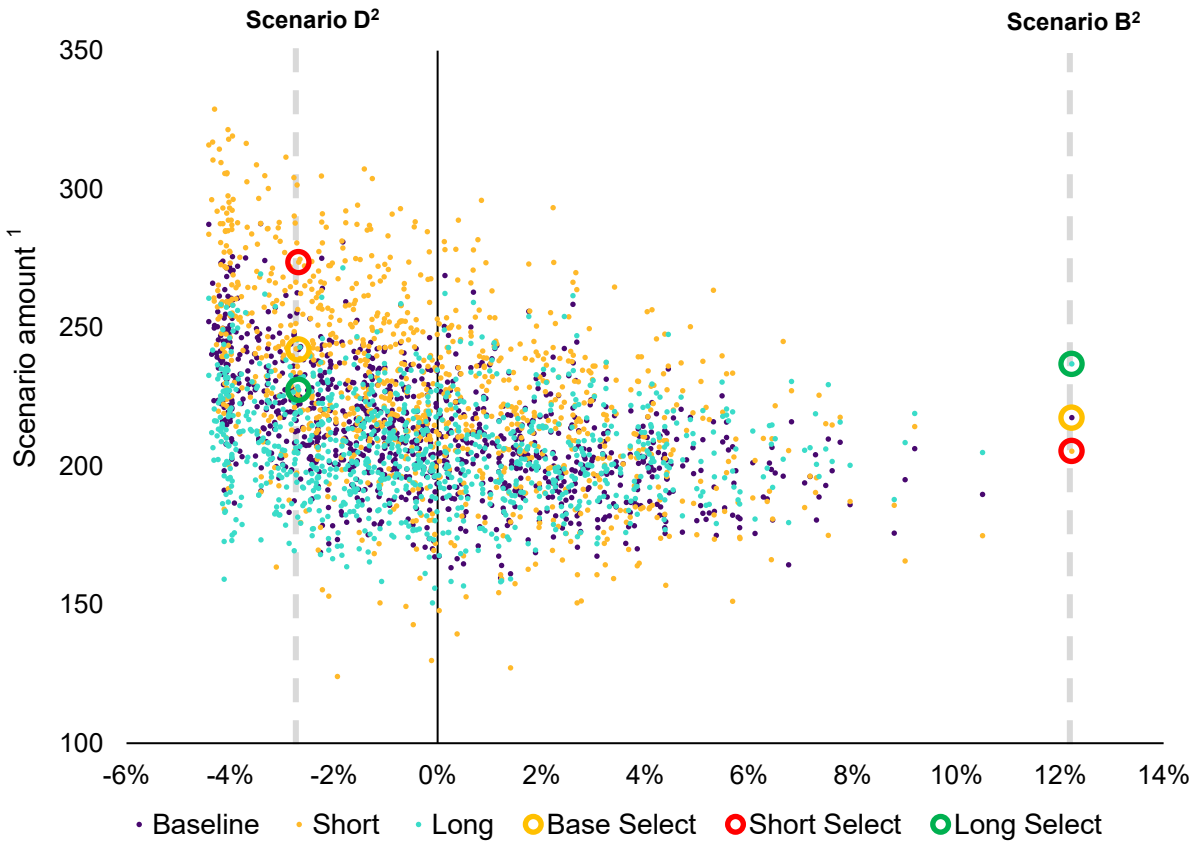
CTE 70 by asset strategy

Short	269
Baseline	240
Long	229

Observations

- Short asset strategy has a wider range of results, due to the longer duration compared to FIA accumulation
  - Chart shown to the right displays 5-yeat UST at year 10, where liability duration is longer allowing for higher rates in future projection years

Δ 5-year UST from issue to duration 10



Scenario amounts generally show a linear shift upward for shorter asset strategies

1.Scenario amount is the total asset requirement for the specific scenario, or greatest present value of accumulated deficiencies (GPVAD)
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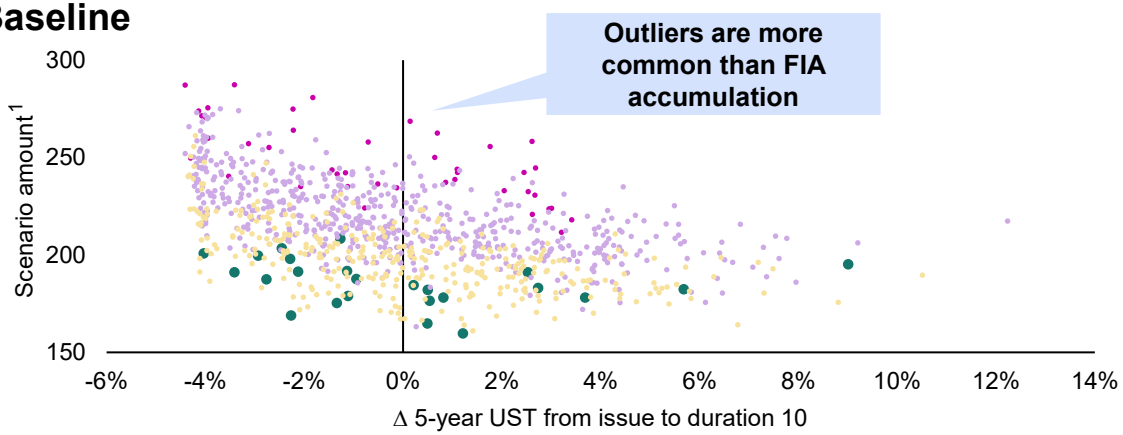
FIA Income (2/2)

Results shown are highly driven by the scenario set

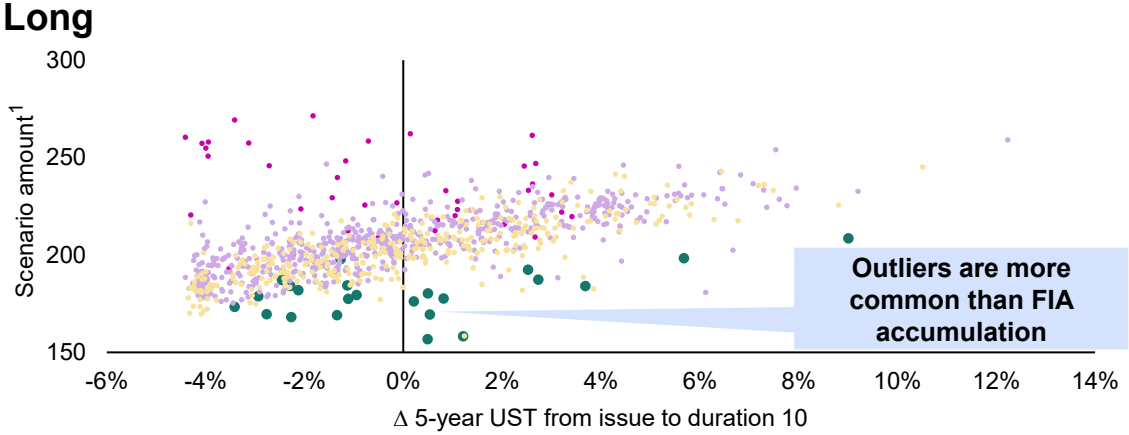
Analysis powered by RiskAgility FM

Equity scenario correlation is more pronounced in FIA income compared to FIA accumulation

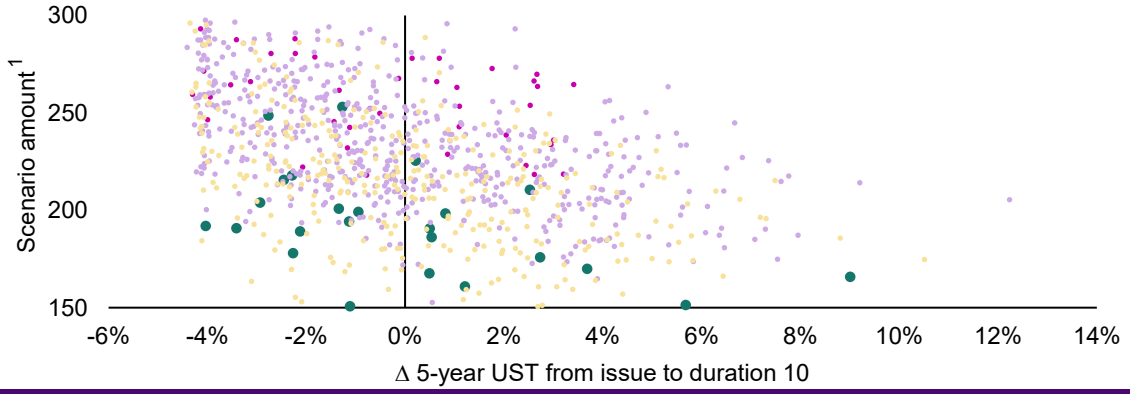
Baseline



Long



Short



Observations

- Equity return correlation is maintained across asset strategies

Equity return legend	High	Medium-high	Medium-low	Low
	8%+	6-8%	3-6%	3% or less

Equity return defined as 1-year S&P500 10% cap with geometric average of the first 10 projection years

Higher equity scenarios are beneficial due to account value hedging. Account value hedging provides hedge returns in excess of required policyholder benefits

1.Scenario amount is the total asset requirement for the specific scenario, or greatest present value of accumulated deficiencies (GPVAD)
2.Scenarios are deep dived in the appendix

SPIA

Results shown are highly driven by the scenario set

Analysis powered by RiskAgility FM

Shorter asset strategies lead to higher scenario amounts in lower interest rate scenarios

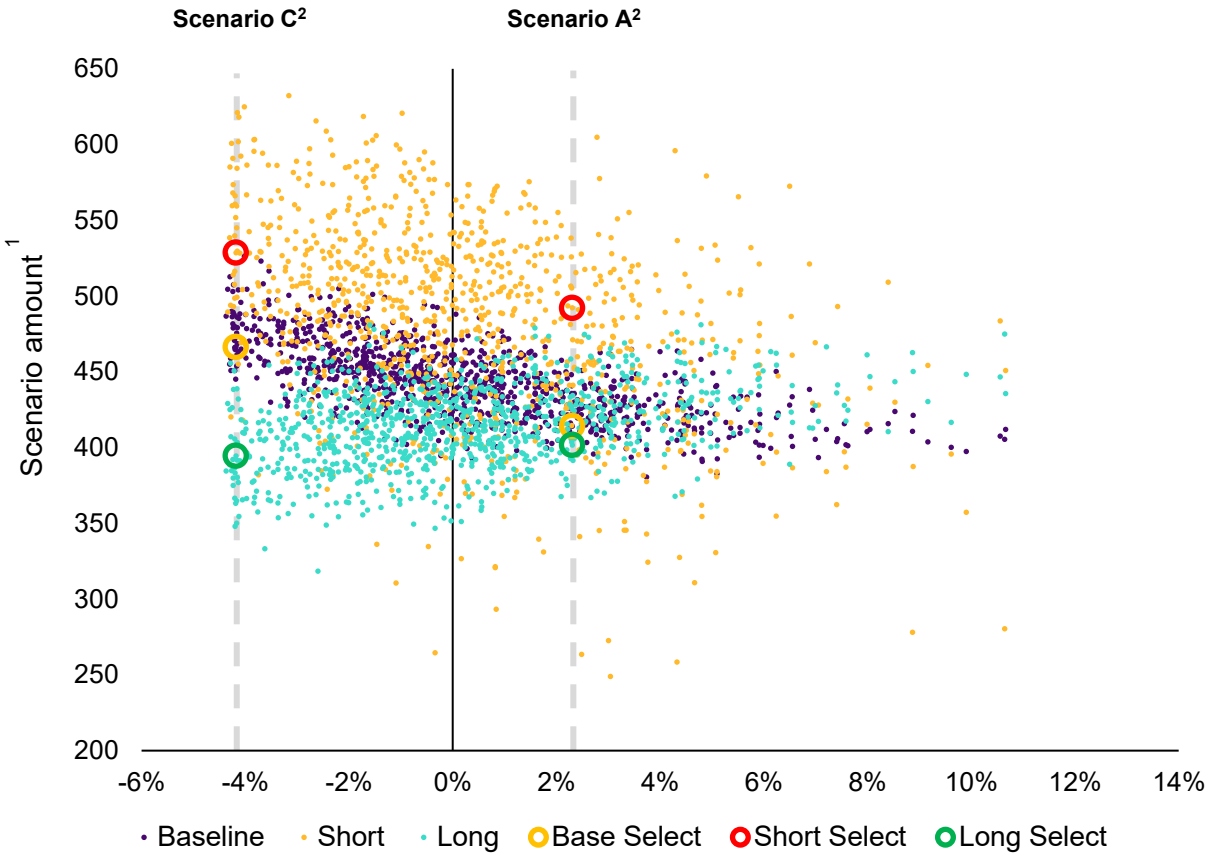
CTE 70 by asset strategy

Short	551
Baseline	473
Long	444

Observations

- SPIA liabilities are not interest sensitive resulting in no impact to liability cash flows from changes in asset strategy

Δ 10-year UST from issue to duration 15



Long asset strategy results in the lowest CTE70 and binding scenarios are increasing rate scenarios

1.Scenario amount is the total asset requirement for the specific scenario, or greatest present value of accumulated deficiencies (GPVAD)
2.Scenarios are deep dived in the appendix

Asset Guardrails

Reinvestment Strategy

Analysis powered by RiskAgility FM

Asset Allocation

Asset Category & Rating*	Guardrail				Non-guardrail			
	MYGA5	FIA Accumulation	FIA Income	SPIA	MYGA5	FIA Accumulation	FIA Income	SPIA
Govt	5%	5%	5%	5%	0%	0%	0%	0%
Corp Bond AA	15%	15%	15%	15%	0%	0%	0%	0%
Corp Bond A	80%	80%	80%	80%	40%	40%	40%	10%
Corp Bond BBB	0%	0%	0%	0%	60%	60%	60%	35%
Corp Bond BB	0%	0%	0%	0%	0%	0%	0%	15%
Private A	0%	0%	0%	0%	0%	0%	0%	20%
Private BBB	0%	0%	0%	0%	0%	0%	0%	20%

Reinvestment assets tenors are the same for guardrail and non-guardrail analysis

Detailed net cash flows and interest rate scenarios are shown in the following slides for scenarios A, B, C and D

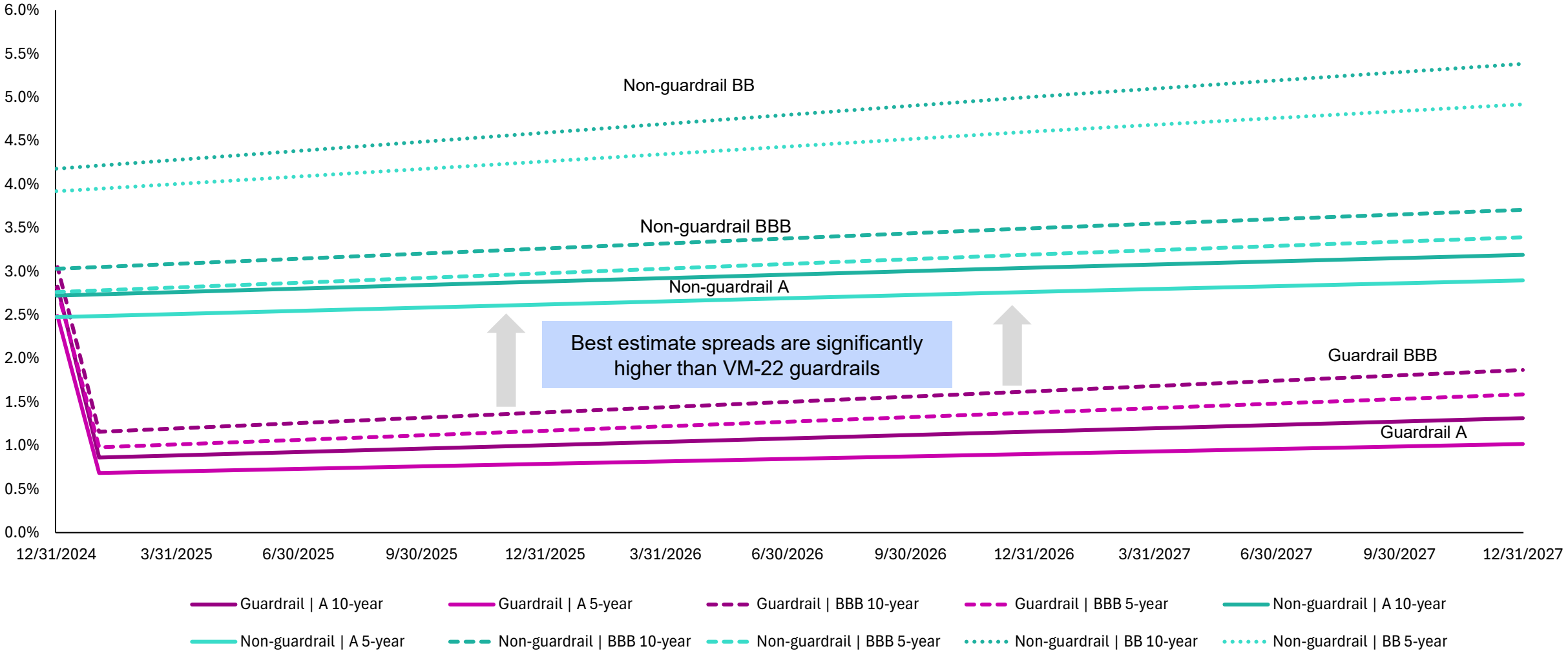
Scenario ranks on the following slides: Rank 1 to 300 are binding scenarios, 301 to 1000 are not included in CTE 70

*Hypothetical S&P rating

Initial Asset Purchase

Analysis powered by RiskAgility FM

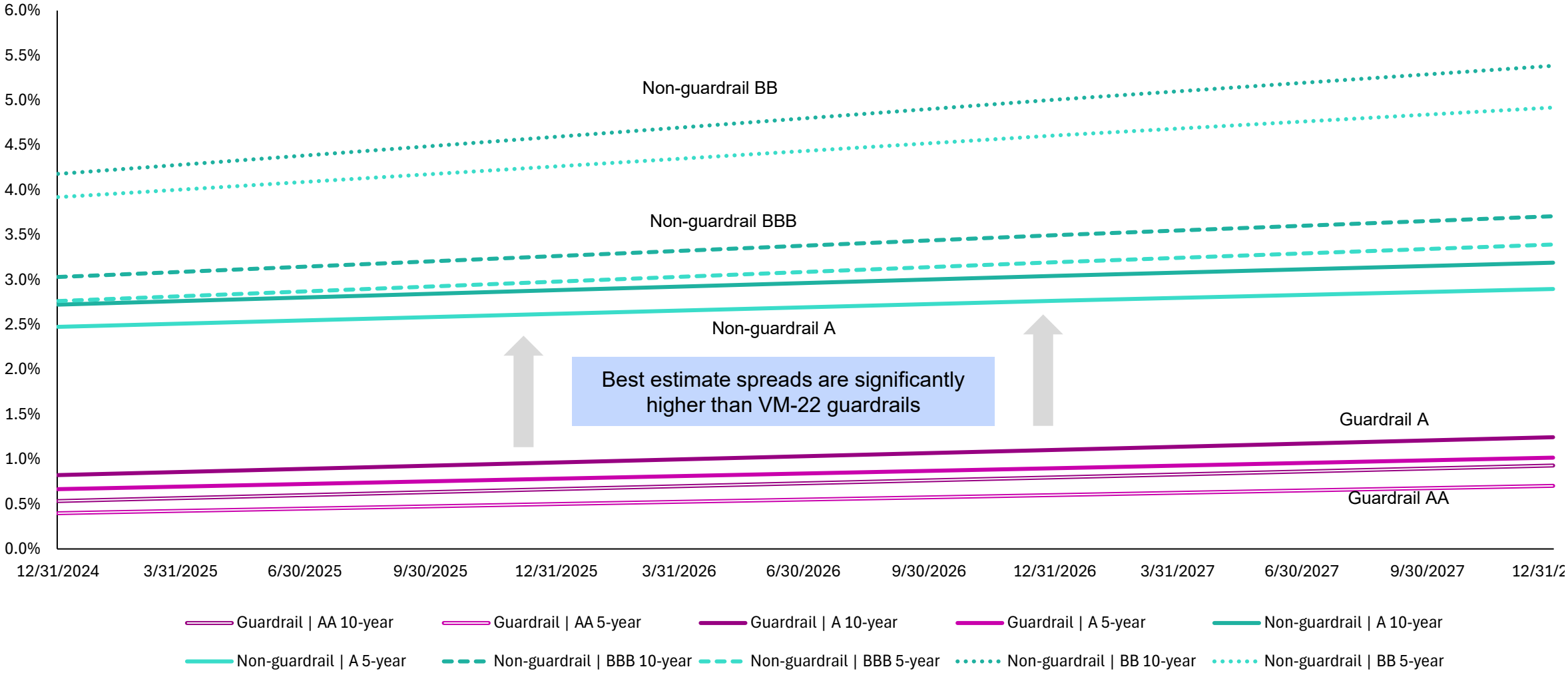
Initial investment spreads



Reinvestment Strategy

Analysis powered by RiskAgility FM

Reinvestment spreads

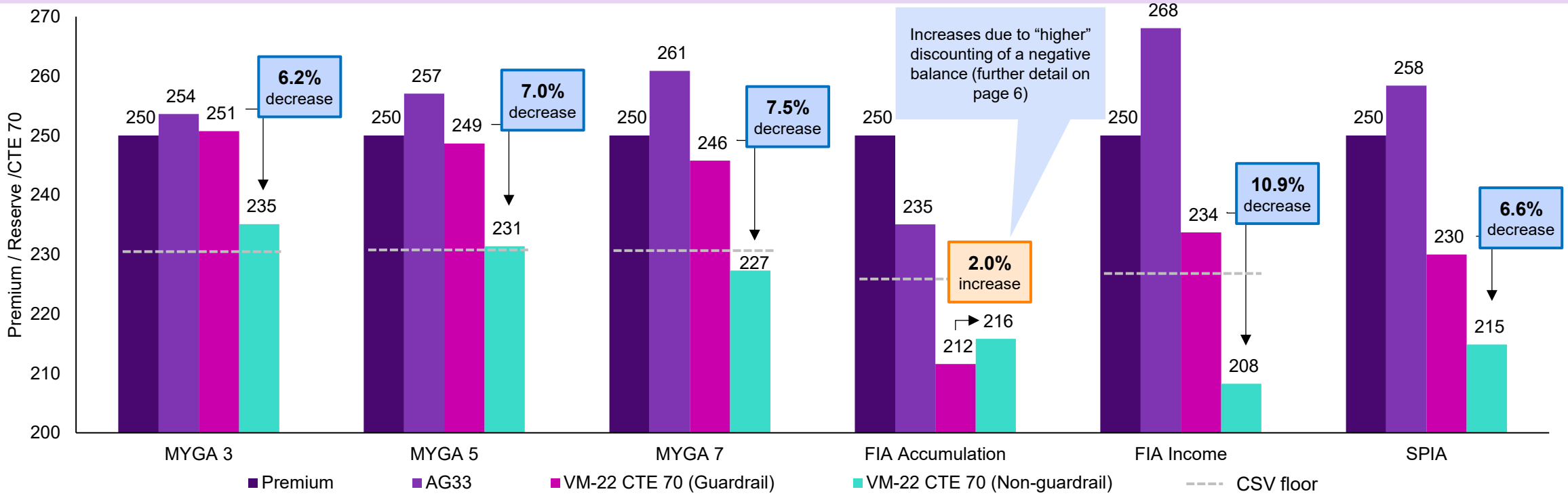


Summary of Results ($M)

Results shown are highly driven by the scenario set

Analysis powered by RiskAgility FM

Background of analysis:
WTW performed an independent analysis of VM-22 reserves using the existing assets guardrail and removal of the asset guardrails for MYGA, FIA accumulation, FIA income and SPIA products. The results are as of December 31, 2024, and market rates reflect those offered for the top 25% percentile of competitiveness. Guardrail represents results under the prior guardrails (pre-March 2026) and Non-Guardrails assumes a representative company's assets strategy without application of VM-22 asset guardrails.



Long-dated guaranteed rate products exhibit a greater reduction in CTE 70 due to a higher reliance on reinvestments

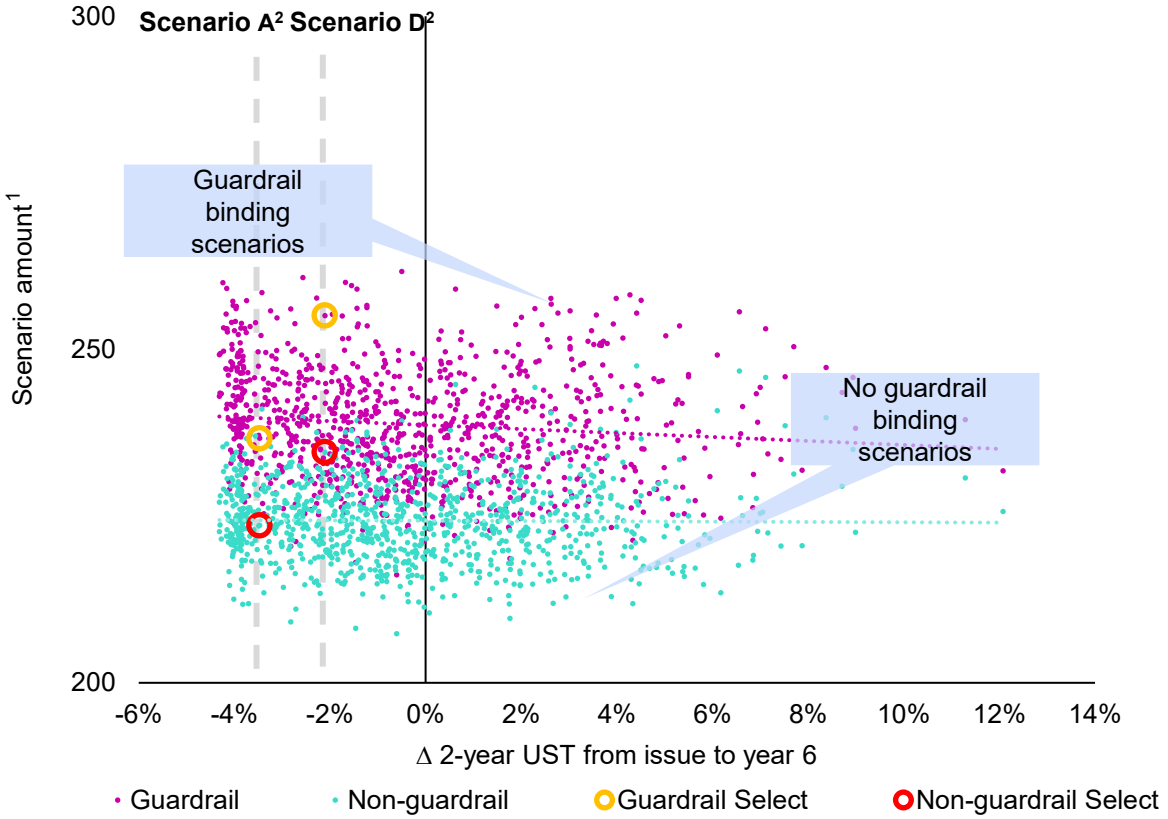
MYGA5

Results shown are highly driven by the scenario set

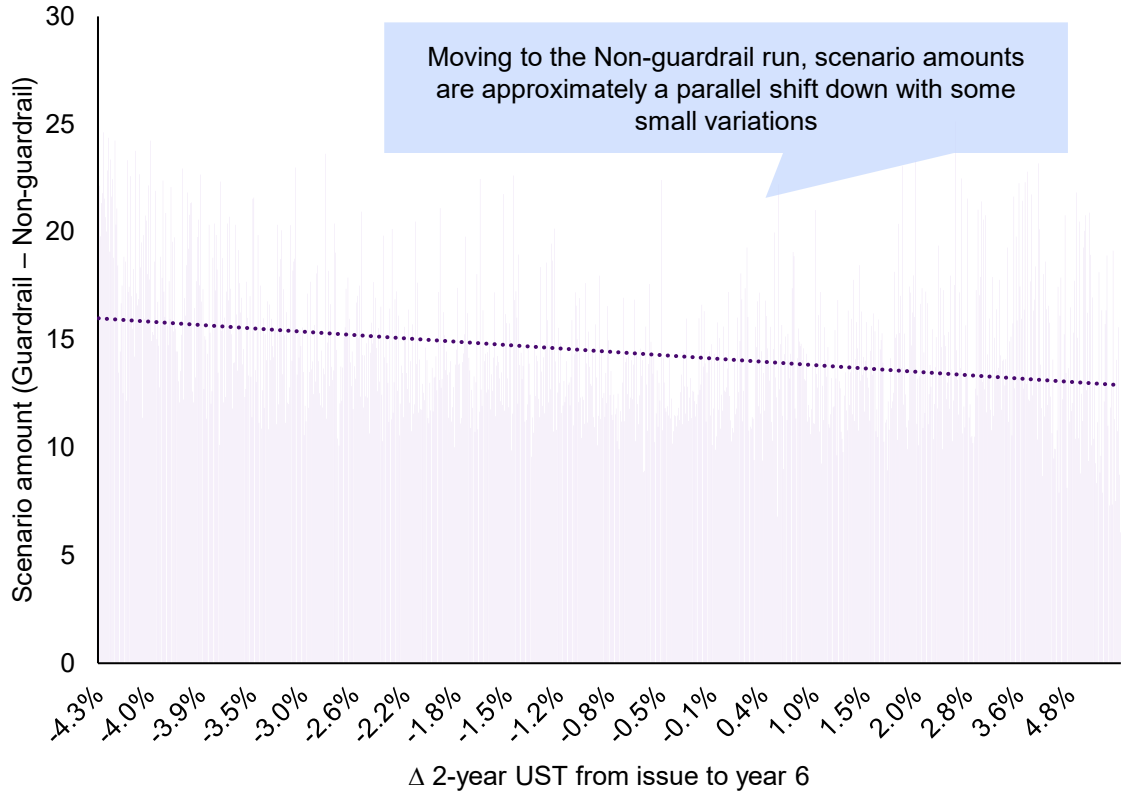
Analysis powered by RiskAgility FM

CTE 70	Guardrail	249	Non-guardrail	231

Δ 2-year UST from issue to duration 6



Guardrail minus non-Guardrail



CTE 70 for the guardrail run is higher, driven by lower investment returns under the guardrail run

1.Scenario amount is the total asset requirement for the specific scenario, or greatest present value of accumulated deficiencies (GPVAD)
2.Scenarios are deep dived in the appendix
3.Competitor rates are the credited rates offered by competitor companies in the scenario

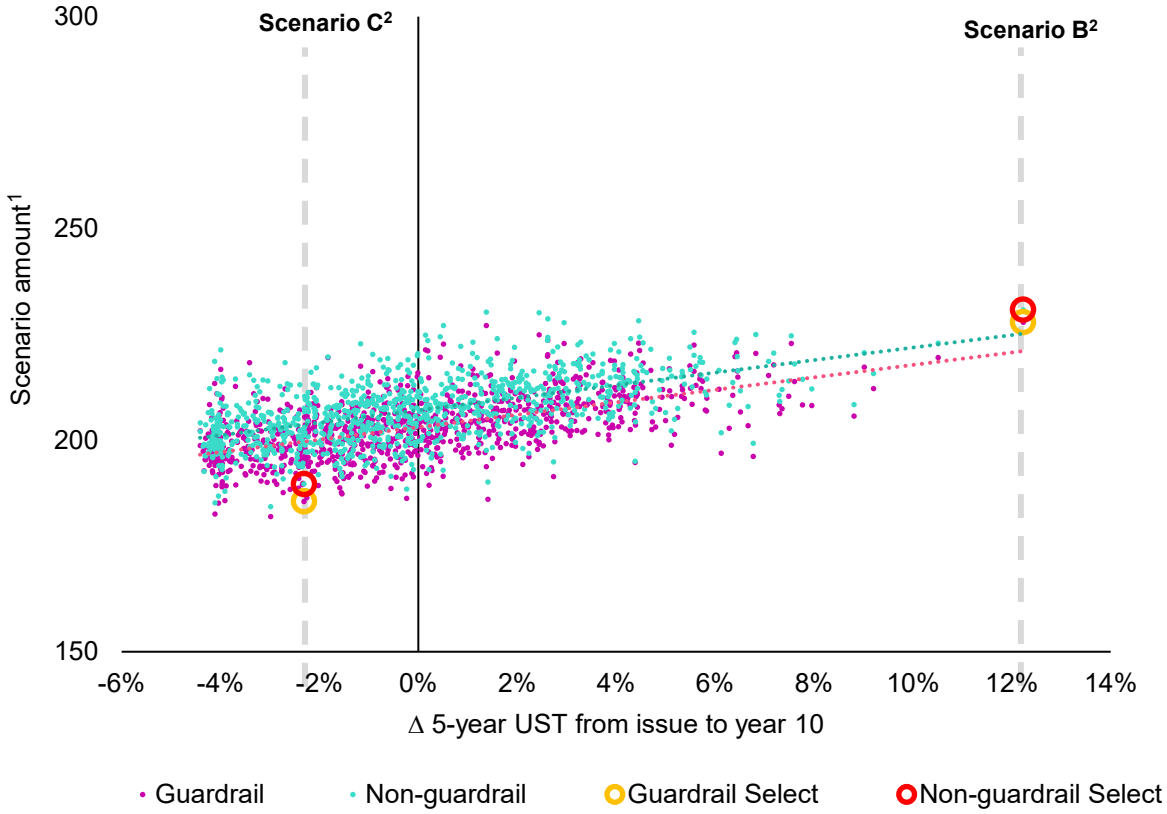
FIA Accumulation (1/2)

Results shown are highly driven by the scenario set

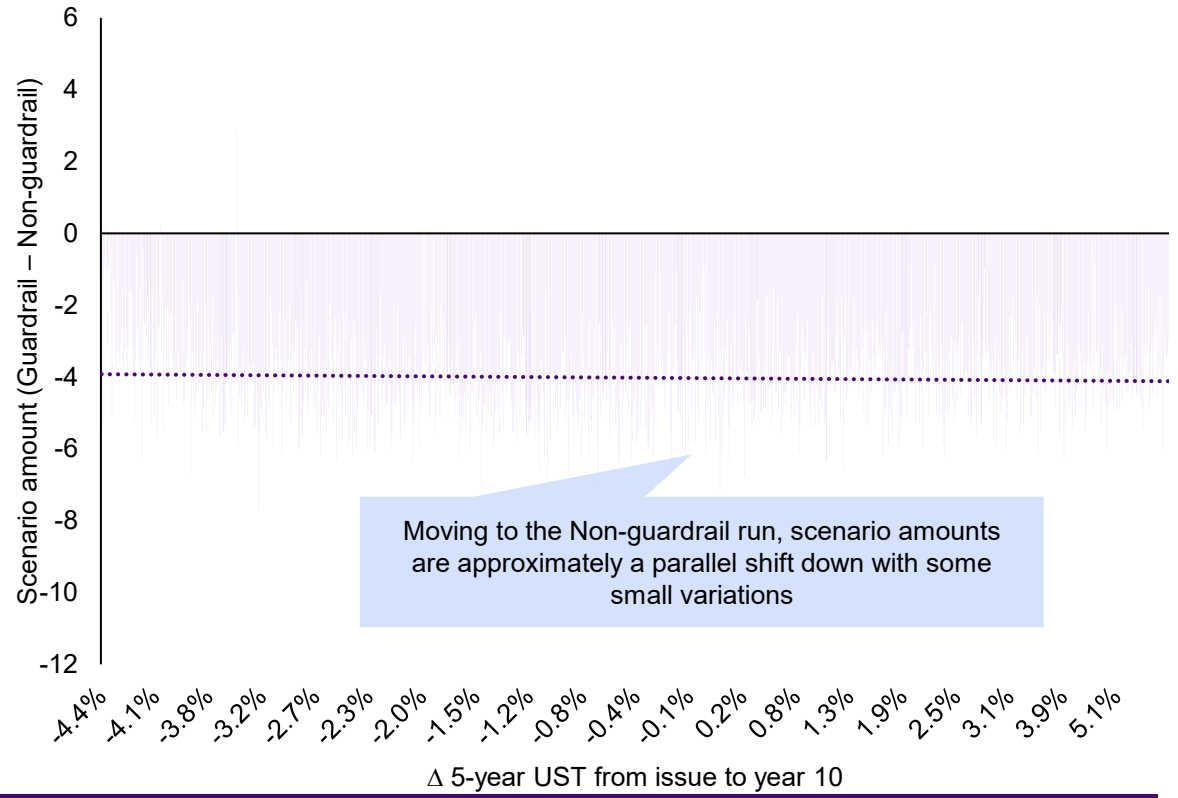
Analysis powered by RiskAgility FM

CTE 70	Guardrail	212	Non-guardrail	216

Δ 5-year UST from issue to duration 10



Guardrail minus non-guardrail



Non-guardrail has higher reserves driven by higher discounting of a negative balance, resulting in a higher overall reserve

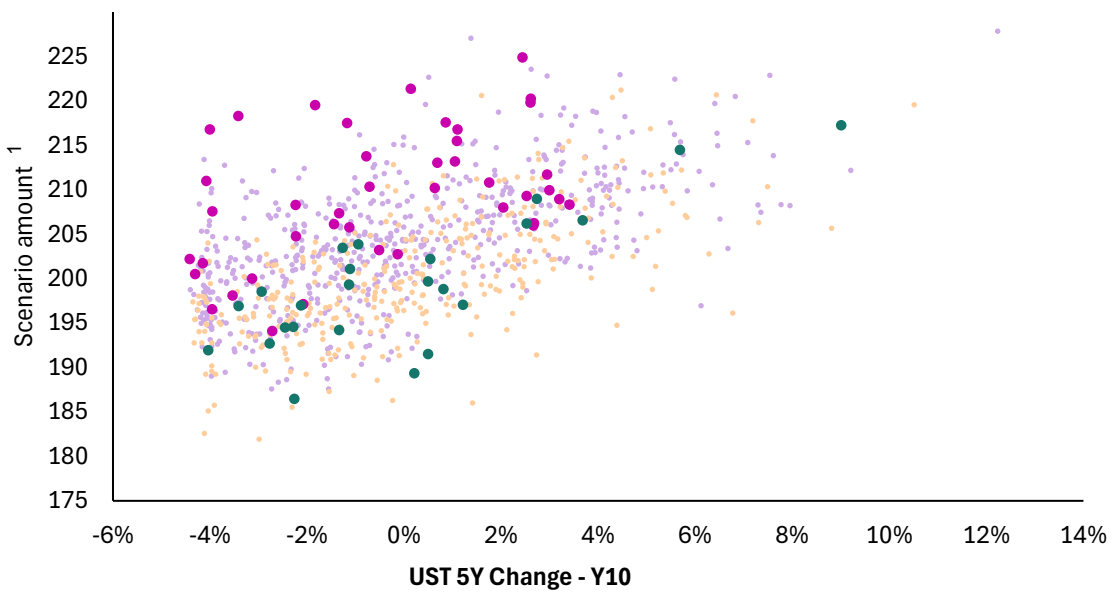
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FIA Accumulation (2/2)

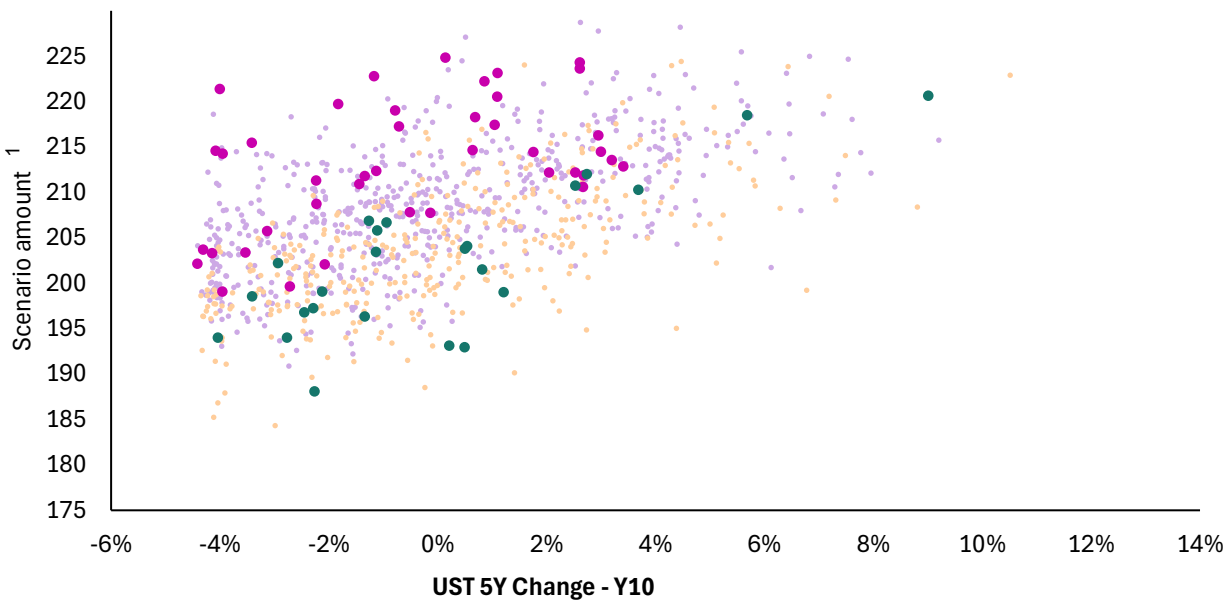
Results shown are highly driven by the scenario set

Analysis powered by RiskAgility FM

Guardrail



Non-guardrail



Observation

Equity return and scenario level correlation is maintained in Guardrail and Non-guardrail runs. Change is related to the difference in investments.

Equity return legend Medium-Low · Medium-High · Low · High

Equity return defined as 1-year S&P500 10% cap with geometric average of the first 10 projection years

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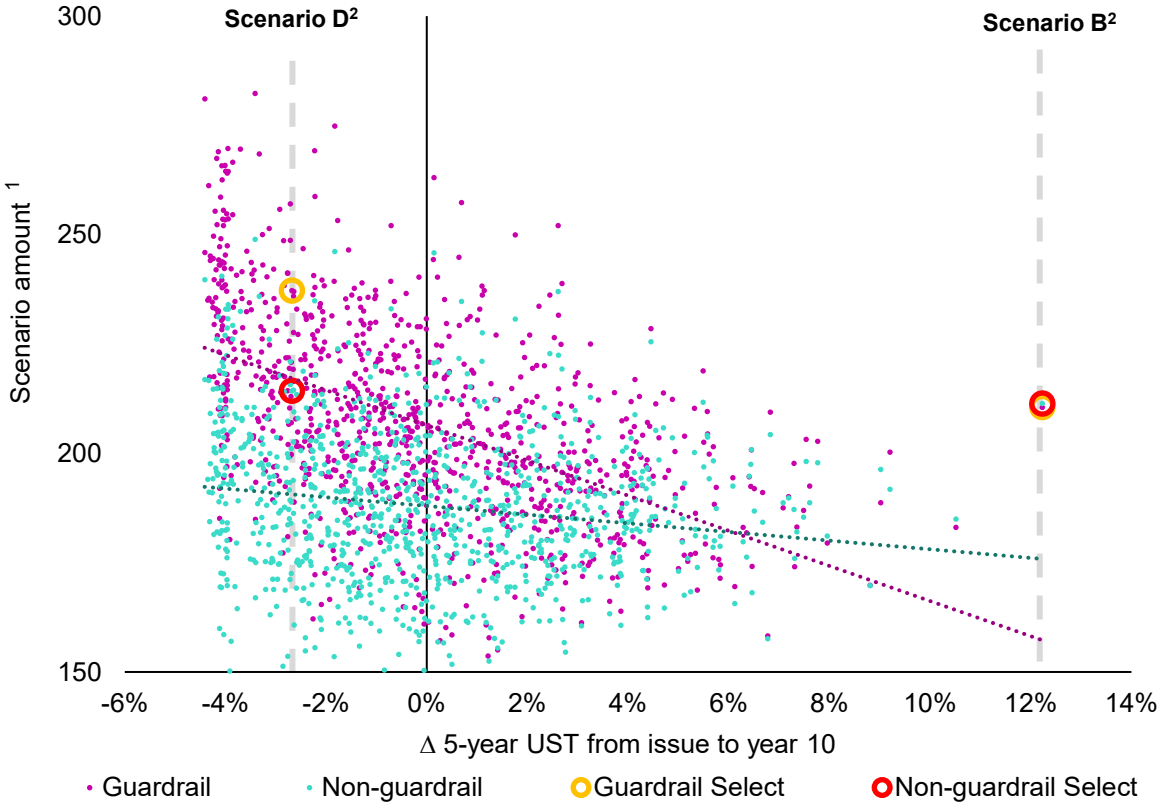
FIA Income (1/2)

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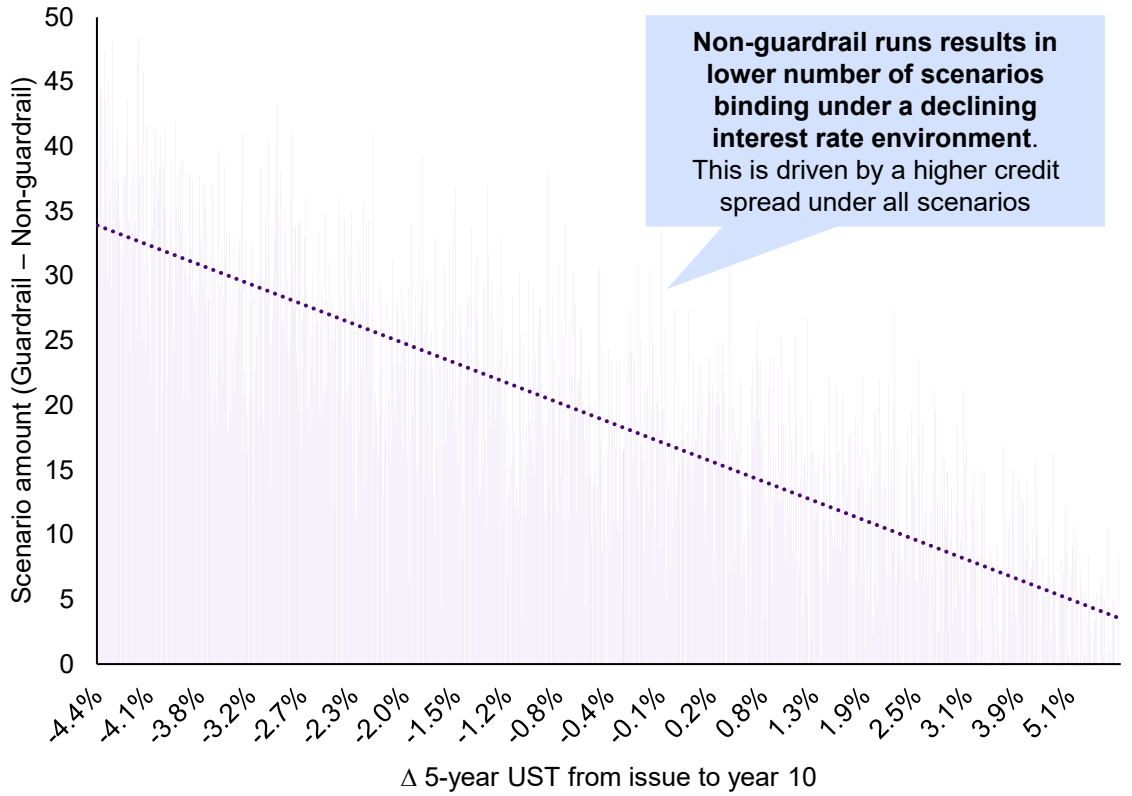
Analysis powered by RiskAgility FM

CTE 70	Guardrail	234	Non-guardrail	208

Δ 5-year UST from issue to duration 10



Guardrail minus non-guardrail



Non-guardrail runs results in lower number of scenarios binding under a declining interest rate environment. This is driven by a higher credit spread under all scenarios

Moving to the non-guardrail run results in less scenarios binding under a declining interest rate scenarios

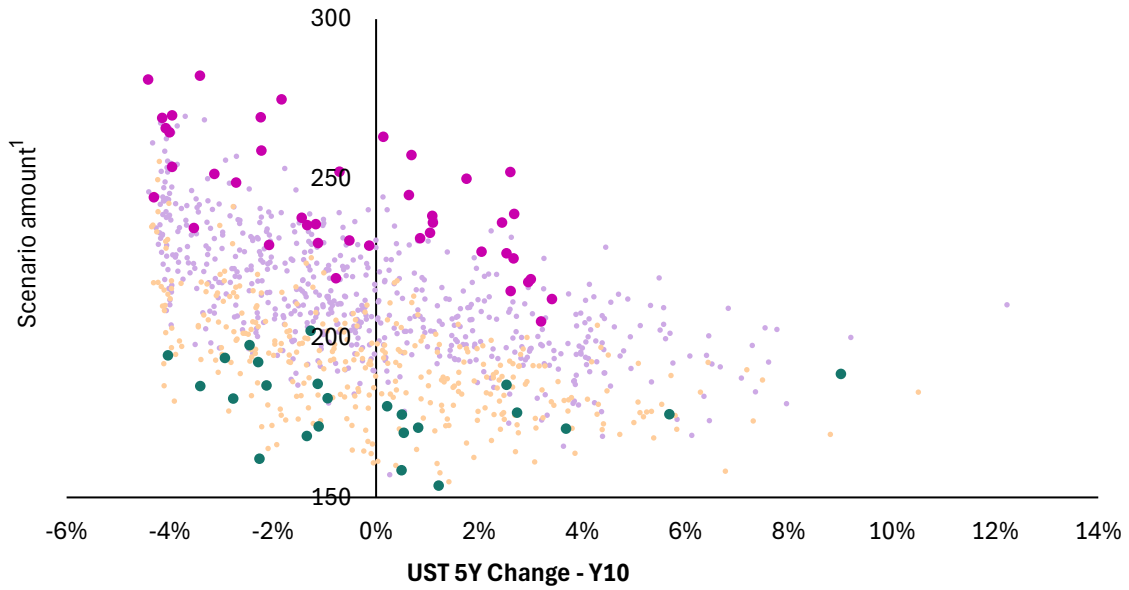
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FIA Income (2/2)

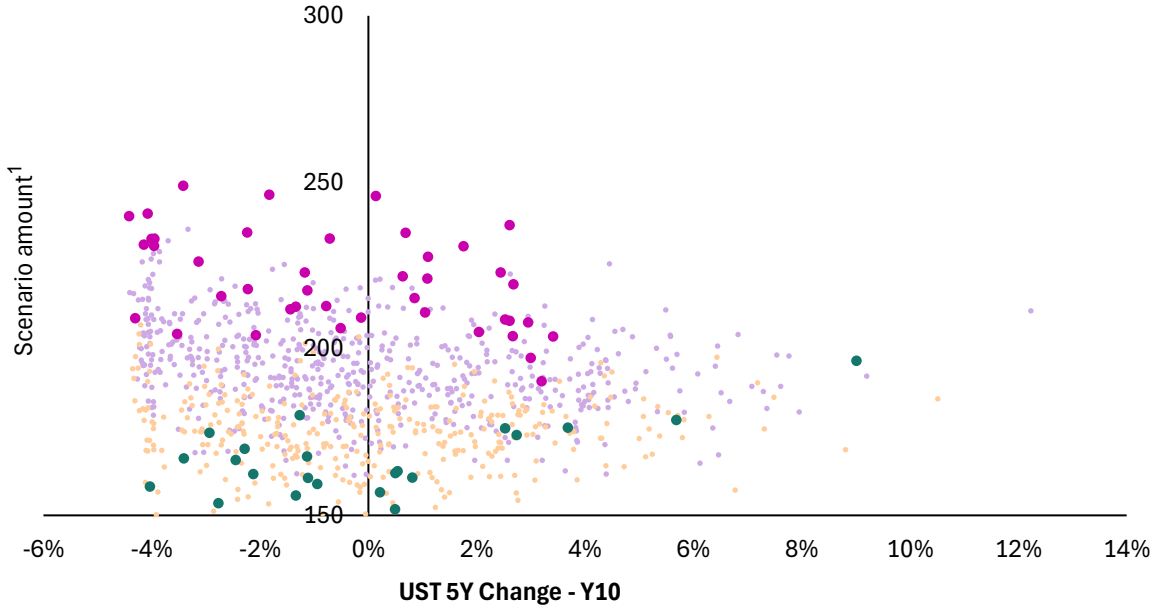
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Guardrail



Non-guardrail



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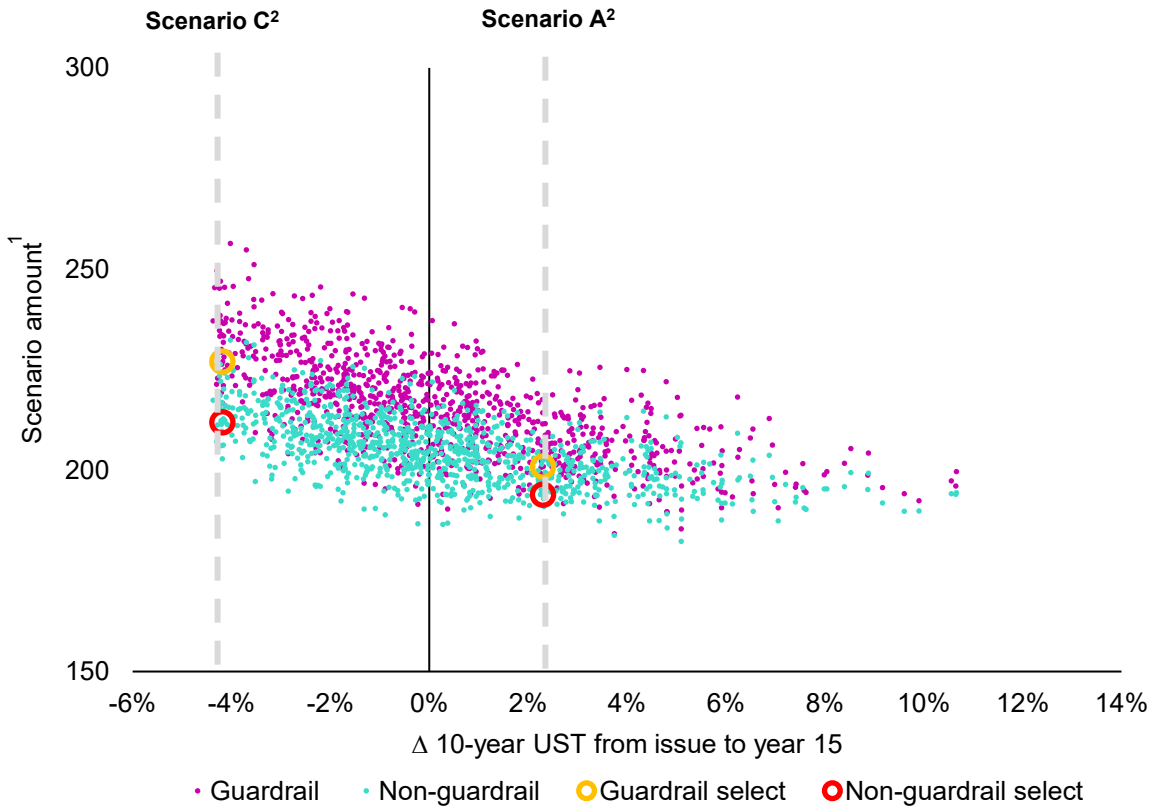
SPIA

Results shown are highly driven by the scenario set

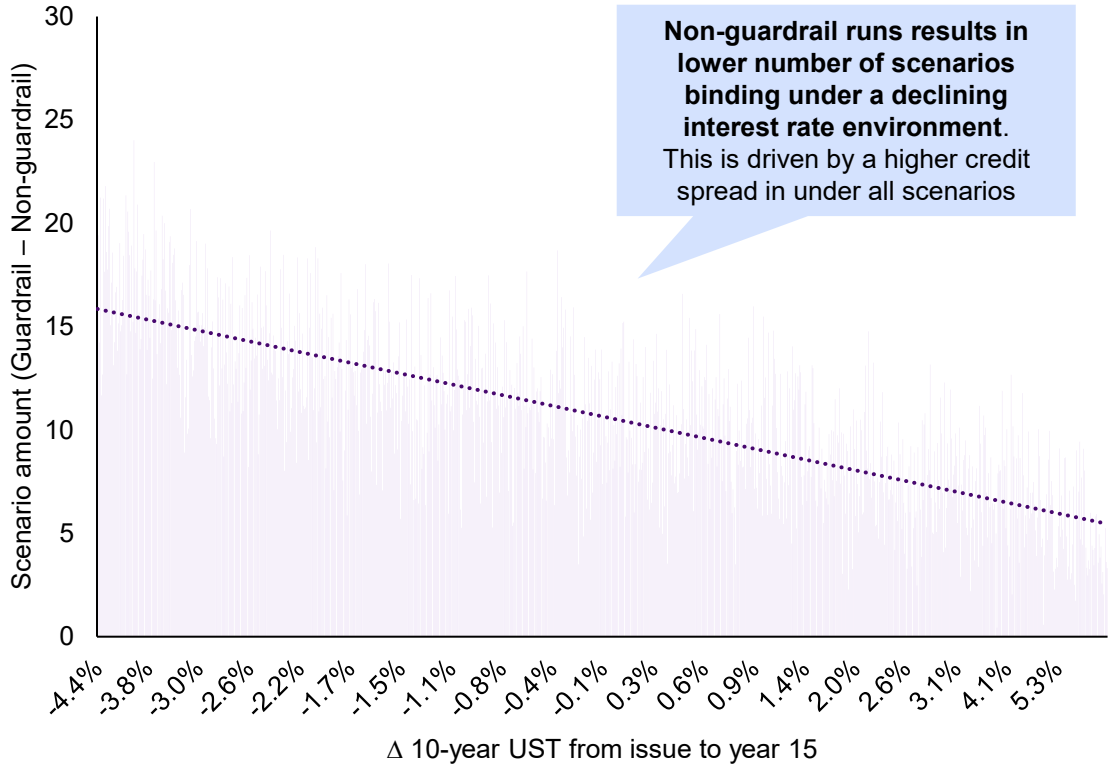
Analysis powered by RiskAgility FM

CTE 70	Guardrail	230	Non-guardrail	215

Δ 10-year UST from issue to duration 15



Guardrail minus Non-guardrail



Guardrail results in the lowest CTE70 and binding scenarios are in decreasing rate scenarios

1.Scenario amount is the total asset requirement for the specific scenario, or greatest present value of accumulated deficiencies (GPVAD)Scenarios are deep dived in the appendix

Implementation

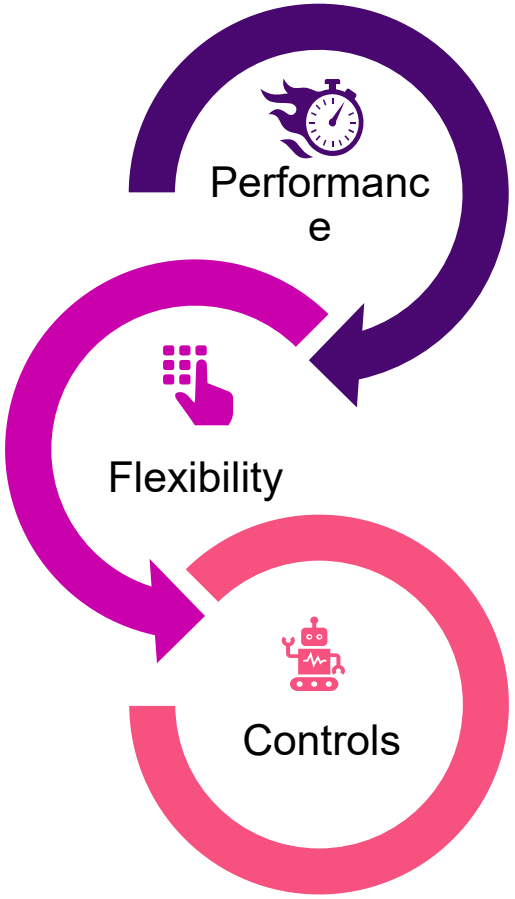
Implementation Considerations

Implementation will require assessing capabilities and potentially enhancing them

	Considerations
1	Technology and Tools
2	Experience and Assumptions
3	Governance, Documentation and Controls
4	Strategic Analysis

1 Technology and Tools

VM-22 will be impetuous for companies to reconsider their modeling platform



Performance

- Runtime efficiency can be achieved with distribution of inner and outer loops
- Optimize engine and cores - GPU is faster for some run types, but can be significantly more expensive
- Performance per dollar *is key*

Flexibility

- Ability to reflect segment-specific investment / reinvestment strategies
- Ability to analyze scenario specific results and perform attribution analysis
  - Seamless assumption set or data file input setup and changes to develop waterfalls

Controls

- Transparent and auditable output
- Ability to audit loop mechanics and not just total results
- Automation of manual touchpoints

2 Experience and Assumptions

Experience studies matter! Company experience can decrease reserves under VM-22

	Key areas to consider
1	Refine experience study processes and frequency
2	Leverage industry data to supplement lack of experience, when needed
3	Margin levels will depend on credibility
4	No binding SPA in VM-22, so assumptions matter when achieving reserve relief
5	Harmonized reinvestment strategy assumptions will be key to aggregation benefits
6	All of this subject to additional regulator / auditor scrutiny

3 Governance, Documentation and Controls

Modeling and documentation complexity emphasizes controls

Key areas to consider	
1	Have you produced a VM-31 report before? Not to be underestimated
2	What type of validation have models undergone? Will this be revisited on a frequent basis?
3	Do models have documentation and governance processes in place?
4	PBR Documentation production strain is alleviated with process automation and tools

4 Strategic Analysis

When and what products do we want to implement first?

Key questions being asked by most companies is:

When should we implement?

Should we implement certain products earlier and others later?

	Key areas to help assess implementation
1	Asset allocation approach: Should a new approach be taken to minimize reserve volatility? Will more companies leverage swaps for longer liabilities?
2	ALM approach: Duration management will become more important especially with reinvestments being guard railed
3	Reserve volatility
4	Comparison of existing US statutory reserves and potential offshore solutions
5	AG55 impacts / considerations
6	Results compared to existing Fin-Re agreements
7	Will some products pass the SET?