

# PBR: Is it almost 2019 already?!? How ready are you for PBR?

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# Biographies – Ben Farnsworth

**Ben Farnsworth, FSA, CERA, MAAA, CFA**  
**Director, KPMG LLP**

Ben Farnsworth is a Director in KPMG's Risk Analytics practice with over 15 years' experience in the life insurance industry. His current areas of focus include financial transformation, business analytics, model validation and risk analysis, and actuarial audits.

He is a Fellow of the Society of Actuaries, Member of the American Academy of Actuaries and CFA charter holder.

# Biographies – Reanna Nichol森

**Reanna Nichol森, FSA, MAAA**  
**Corporate Vice President & Actuary, New York Life Insurance Company**

Reanna Nichol森 is a Corporate Vice President & Actuary for New York Life Insurance Company and is responsible for the implementation of Principle-Based Reserving. Reanna has worked within the New York Life departments of Financial Risk Management and Individual Annuity Product Pricing.

Reanna is a Fellow of the Society of Actuaries (FSA) and a Member of the American Academy of Actuaries (MAAA).

# New York PBR Update



# New York PBR

PBR is not yet adopted in New York State

PBR Bill approved by NY  
State Legislature

Bill has not yet been  
passed to the governor  
for approval

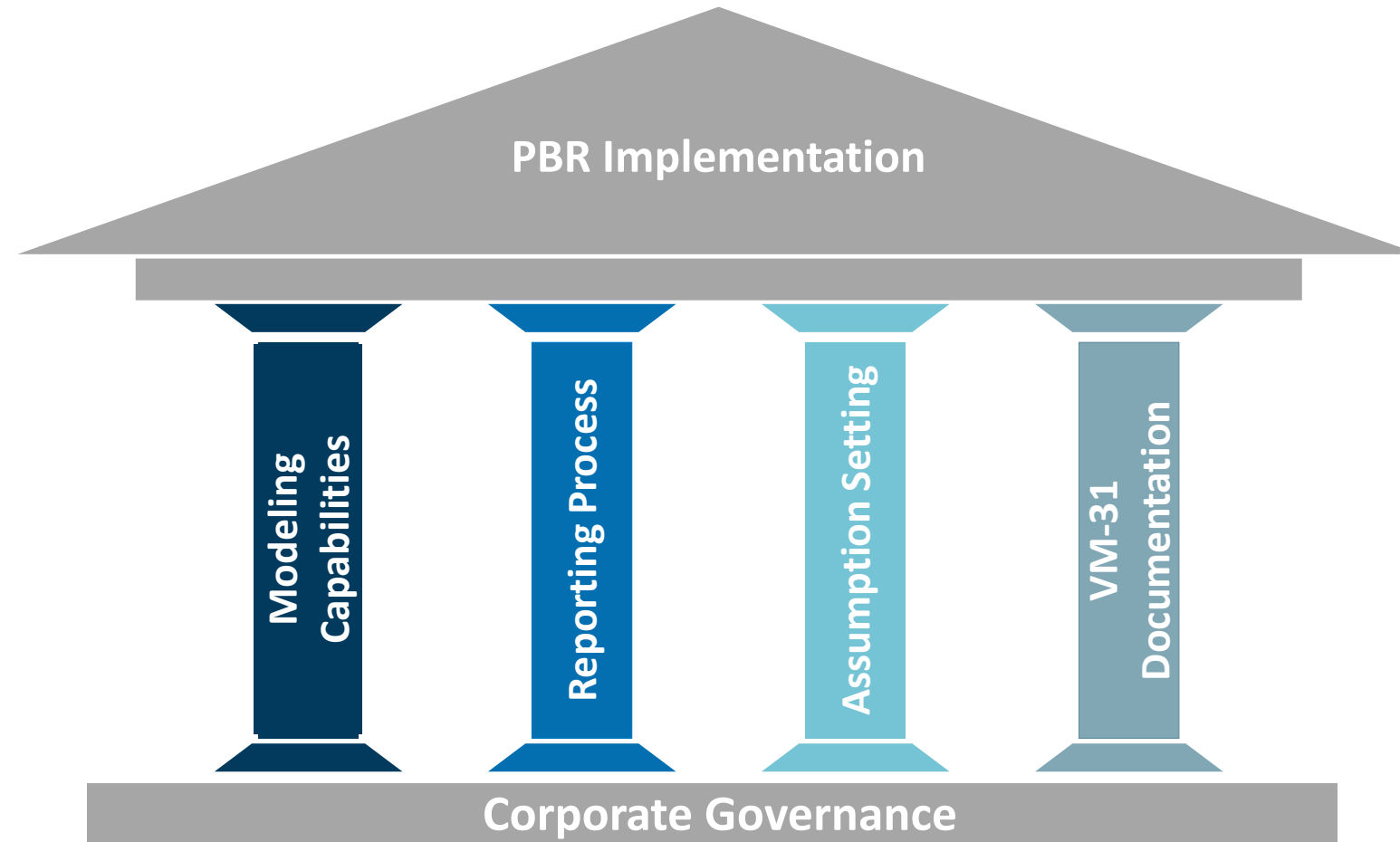
Once (and if) Bill is  
signed by the governor,  
NY DFS expected to  
share proposed PBR  
calculation

Implementation Strategy:  
What should we do in the next year?





# Pillars of PBR Implementation



## Modeling Capabilities

- Upgrade models / request vendor assistance
- Assess computing power
- Consider modeling approximations

## Reporting Process

- Identify data sources
- Set valuation timeline & consider lags
- Establish reporting and rollforward process

## Assumption Setting

- Ensure compliance with PBR
- Review assumption governance
- Establish frequent experience studies

## VM-31 Documentation

- Draft documentation during implementation
- Incorporate in valuation processes
- Gather supporting documentation

# PBR Resources

## Academy PBR Toolkit

- Model Governance Checklist -> Governance and validation items covering 10 governance categories for companies to consider
- Model Governance Practice Note -> Practice note on models, model risks, and model governance
- Life PBR Practice Note -> Reviews PBR valuation practices in Q&A format

## Academy PBA Projections Practice Note

- Reviews common projection methods
- Provides techniques for complexities, including starting assets and mortality grading
- Addresses Simplifications

## PBR Assumptions Resource Manual

- Expected to be released in 2018
- Provides PBR assumption development framework and case studies

# Beyond Valuation: Projecting PBR Reserves



# Why project PBR reserves?

- Future PBR reserves needed for actuarial projections, including: financial planning & forecasting, product pricing, or ALM analysis

Based on actual PBR valuation

| <b>Income Statement</b> | <b>12/31/2018</b> |
|-------------------------|-------------------|
| Premium Income          |                   |
| Investment Return       |                   |
| Total Revenue           |                   |
| Benefit Outgo           |                   |
| Expenses                |                   |
| Increase in Reserve     |                   |
| Total Expenses          |                   |
| Taxes                   |                   |
| Net Income              |                   |

Projected based on future values & assumptions

| <b>12/31/2019</b> | <b>12/31/2020</b> | <b>12/31/2021</b> |
|-------------------|-------------------|-------------------|
|                   |                   |                   |
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# Why are nested models needed to project PBR reserves?

- Nested models are needed to because assumptions will differ between actuarial projections (outer loops) and PBR valuations (inner loops), or may change over time.

## Liability Assumptions

- Credibility
- Mortality improvement

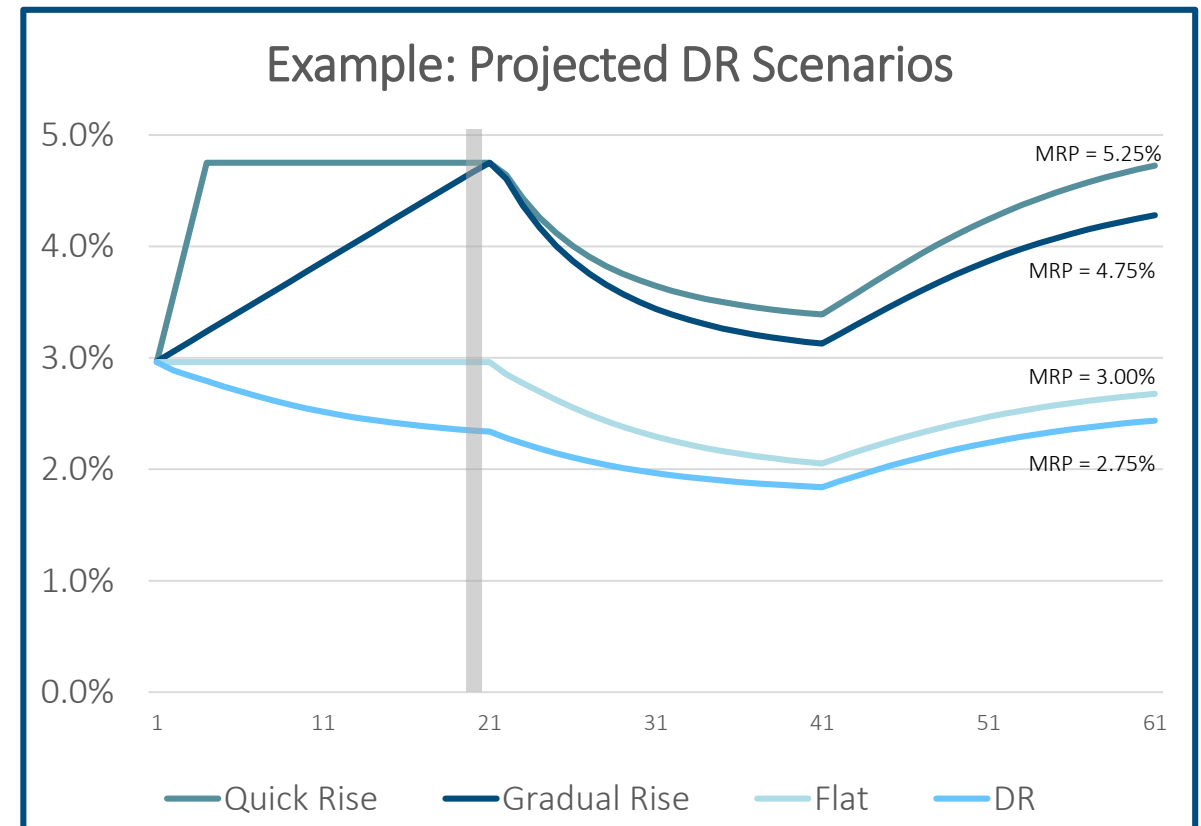
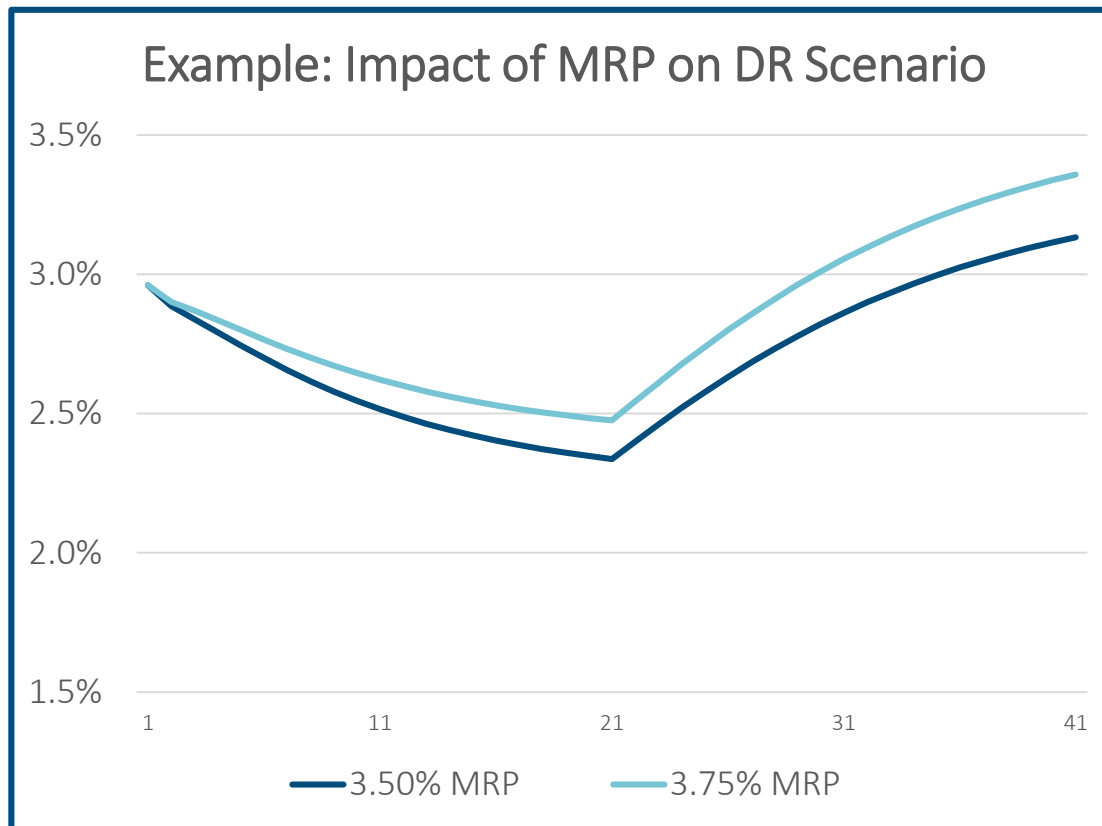
## Asset Assumptions

- Interest and equity scenarios
- Corporate credit spreads
- Asset default cost rates

# Example: Projected Interest Rates

Historical interest rates affect the mean reversion parameter and prescribed PBR scenarios

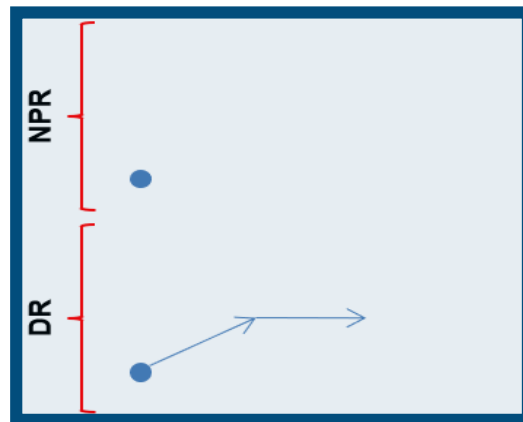
- 20-yr Treasury MRP fell from 3.75% to 3.50% in 2018
- Projected outer loop scenario will drive PBR scenarios



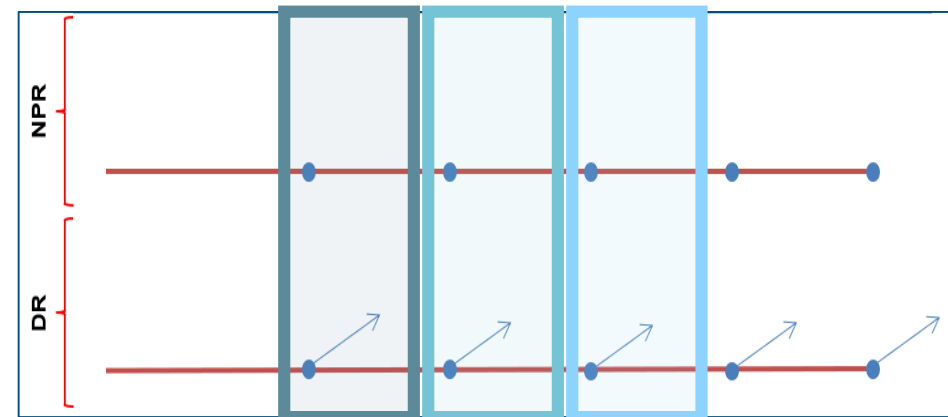
# Using nested models to project PBR reserves

- Nested models are needed to project PBR reserves, since PBR cash flows will not be consistent with company best estimate cash flows.

| Income Statement    | 12/31/2018    | 12/31/2019   | 12/31/2020   | 12/31/2021   |
|---------------------|---------------|--------------|--------------|--------------|
| Increase in Reserve | Valuation Run | Inner Loop 1 | Inner Loop 2 | Inner Loop 3 |

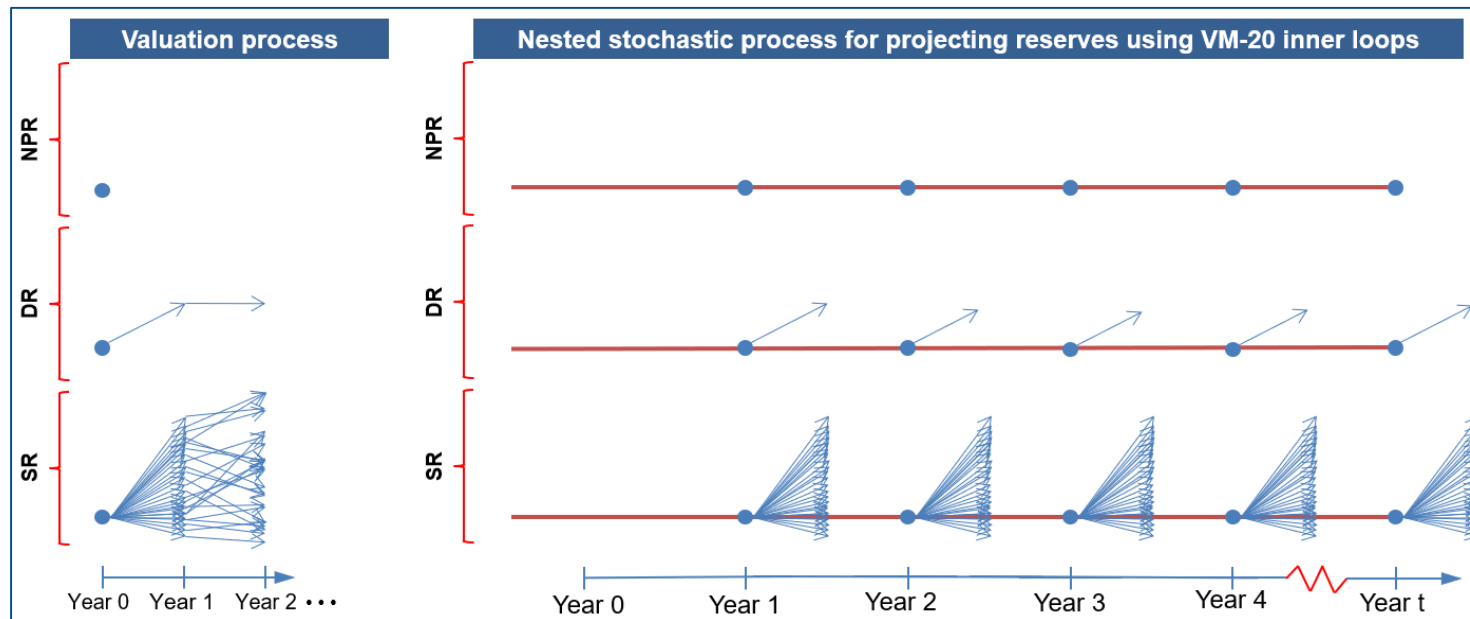


Point-in-time valuation



Inner Loop Projections

# How to build nested models





# Validation of nested models

## Additional challenges to validate inner loop calculations

- Does modeling platform store all inner loop cash flows?
- Balance between minimizing stored output and transparency

## Methods to validate

- Set up validation “outer loop” to validate results in future inner loops
- Establish key variables/output to store in inner loops to replicate results
- Sensitivity tests to confirm expected movements
- Confirm “counts” to ensure no lost policies, assets, or cash flows
- Establish controls similar to valuation for projected valuations as well

# Projection Simplification Techniques

## Proxy Estimate

- Use the NPR or Gross Premium Reserve to estimate DR / SR → Gross Premium Reserve provides economic proxy
- Project reserves at periodic nodes and interpolate in between

## Asset Simplifications

- For a non-interest sensitive product, can model liability only to reduce run-time → May be helpful for iterative activities such as pricing
- Scenario reduction on either the outer loop or the inner loop

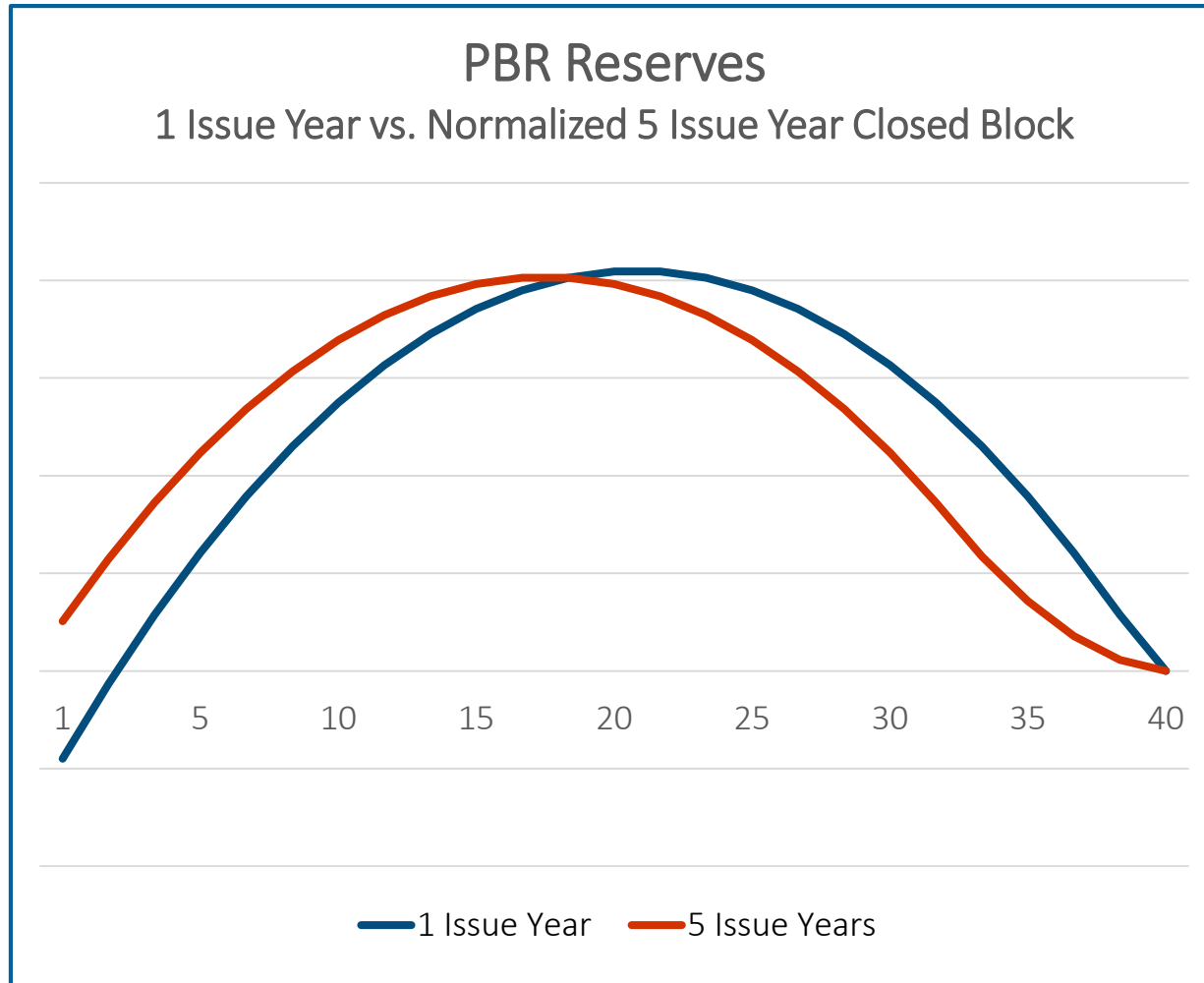
## Investment Strategy Guardrail Demonstration

- Use a subset of population or a reduction in scenarios for the projection
- Compare average credit quality outside of the model rather than run model twice

# Beyond Valuation: Pricing with PBR Reserves



# Pricing Considerations



- Periodically check which PBR component prevails
  - Consider modeling dominant reserve, but tricky if components switch
  - Note segments carrying largest impact (e.g. longer level periods on term)
- Consider how many issue years to reflect
  - Pricing single year of new business vs. cohort approach
  - Product design changes will influence aggregate reserves over time
- Cell-level pricing methods
  - Model aggregate reserves
  - Economic and run-time considerations

# Industry Insights



# Industry Survey Summary

Companies are faced with multiple new regulatory requirements and accounting change initiatives over the next few years. The respondents to the survey are primarily delaying adoption as long as possible with nearly 70% responding that they would adopt in 2019 or 2020.

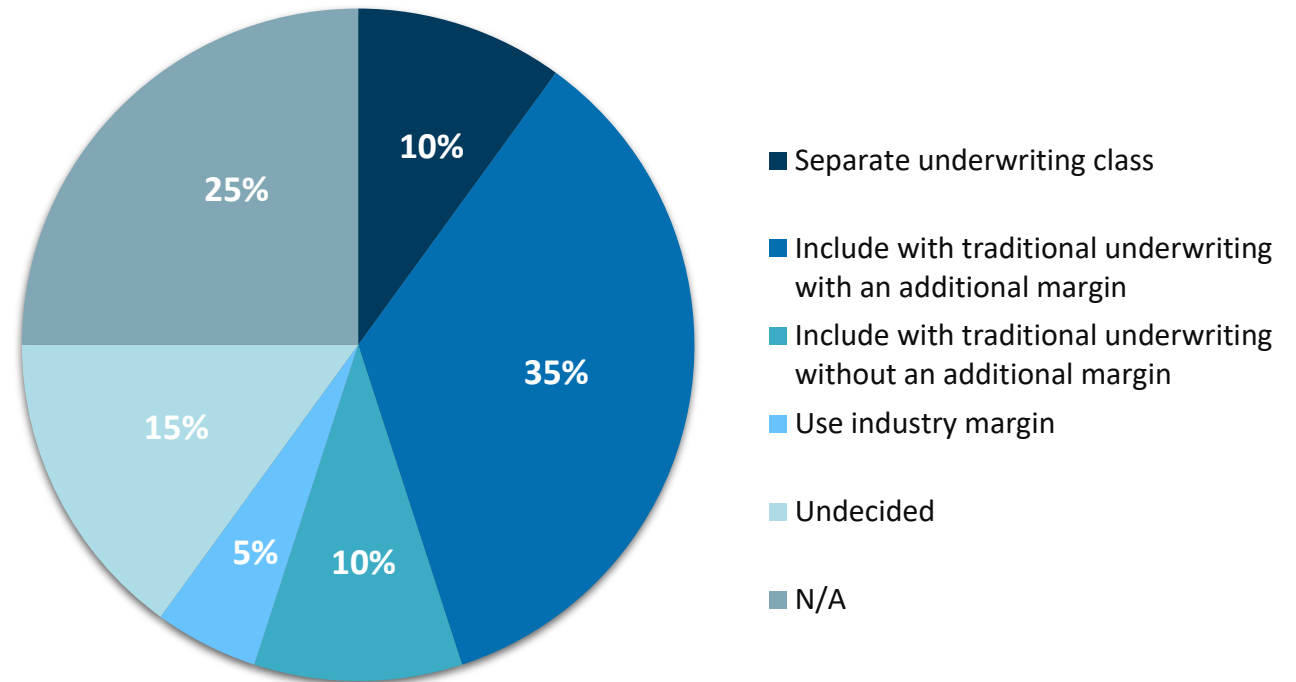
One of the original intentions of a principles based framework was to reduce reliance on reinsurance captives. However, the results of this survey indicate that companies are still evaluating their planned use of reinsurance. 25% of companies responded that they would stop using captives.

Explicit margins on liability assumption is a new concept for statutory reserving. The majority of companies state that a formal policy for setting margins is under development and that margins are primarily set using sensitivity testing rather than a more complex statistical technique.

A fully integrated asset-liability model increases the complexity of the valuation process. About half of the participants indicate they plan to use a single integrated model that projects assets and liabilities. However, over 80% of respondents plan to use the simplification of the 2% collar approach to setting starting assets rather than a direct iteration approach.

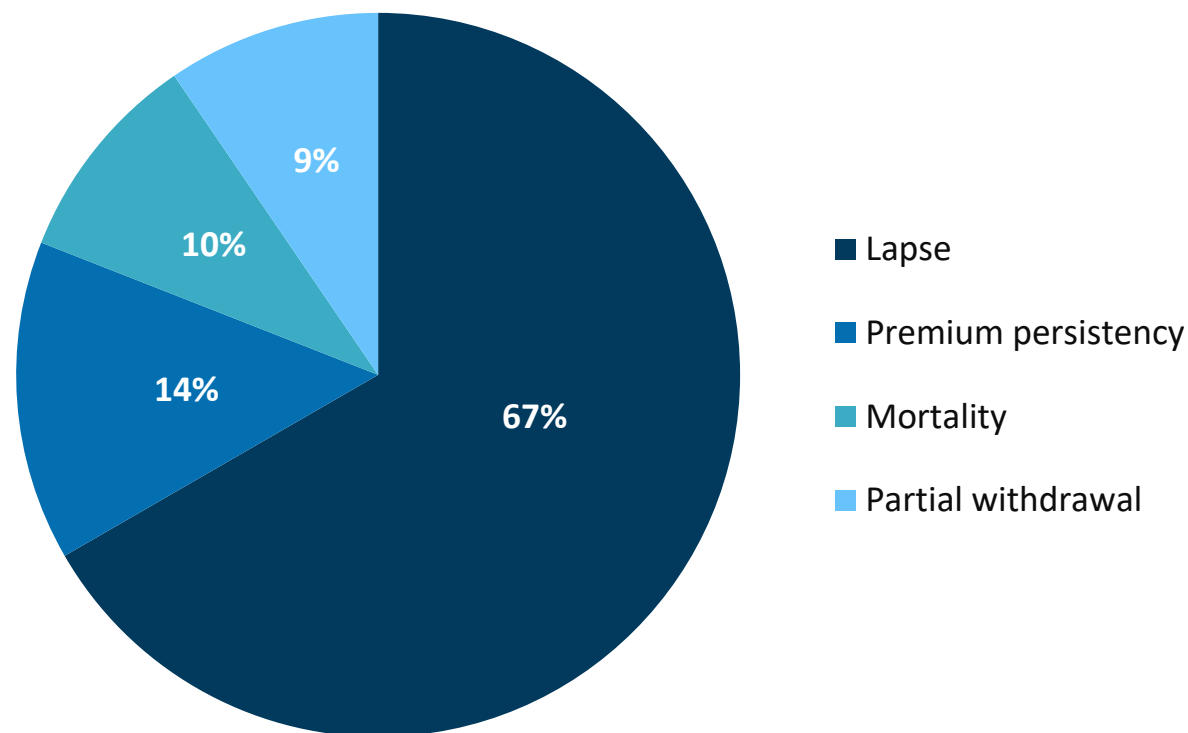
# Plan to determine mortality credibility for policies issued under an accelerated underwriting framework

- Range of practices that companies plan to use
- Leading choice for accelerated underwriting is to include with traditional business with additional margin
- Anticipate this evolving as accelerated underwriting blocks grow and PBR processes evolve



# Dynamic liability assumptions for the stochastic reserve

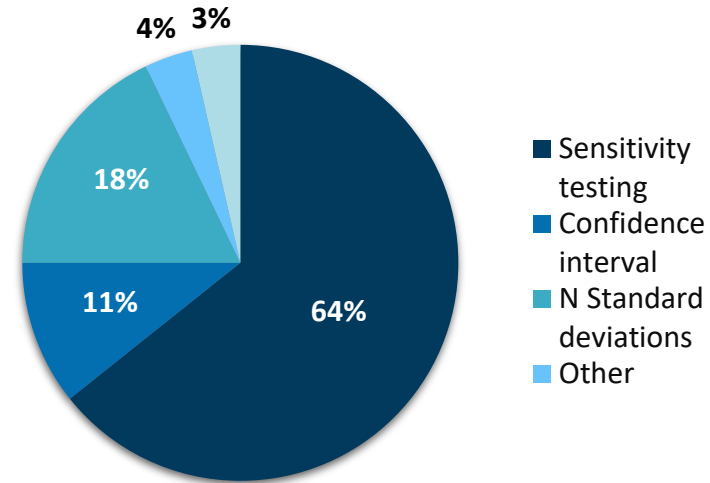
- Majority plan to apply dynamic adjustments to lapse assumptions
- Consistent with principal based valuation for variable annuities
- Industry will need to monitor if additional dynamic multipliers are appropriate in the future





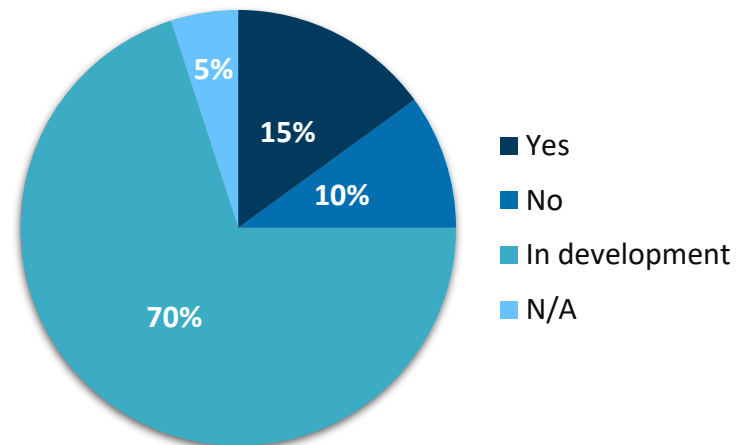
# Method to determine margin on assumptions

- Margins will primarily be set using sensitivity testing initially rather than a more complex statistical technique



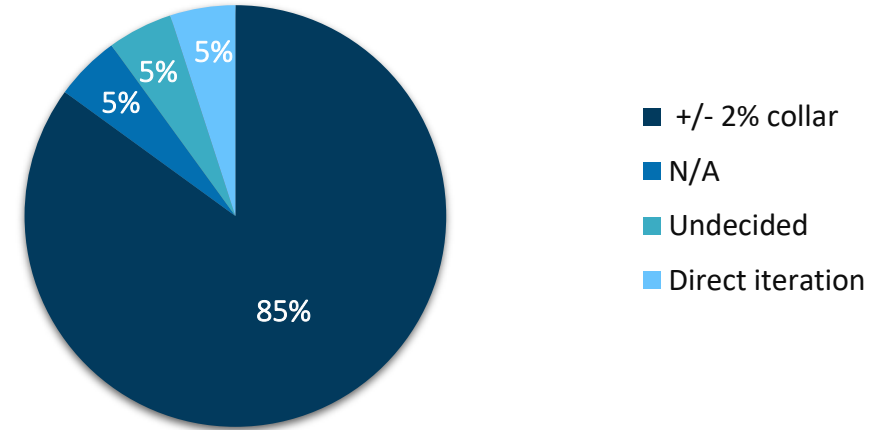
## Is there a formal policy in place for setting margins?

- Majority responded that the policy was in development.
- Opportunity to develop a governance structure that represents leading practices and complies with the guidance in VM-31.



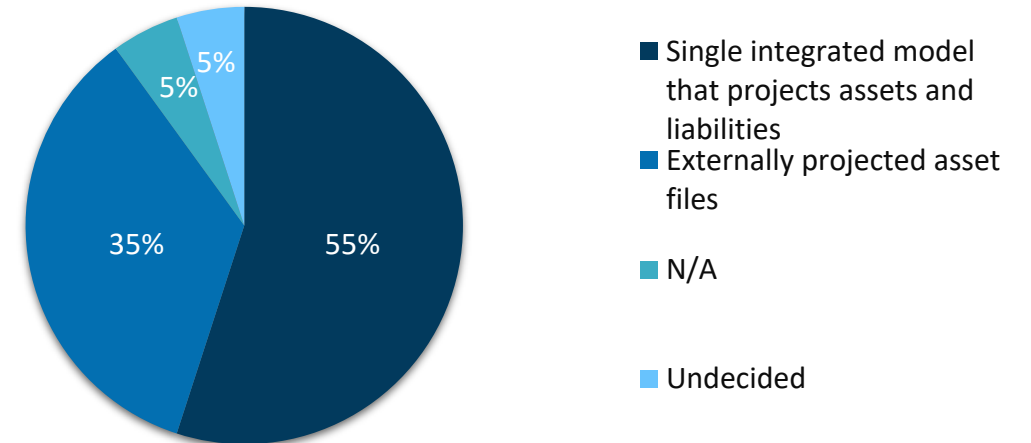
# Approach to set starting assets

- Over 80% of respondents plan to use the simplification of the 2% collar approach to setting starting assets rather than a direct iteration approach



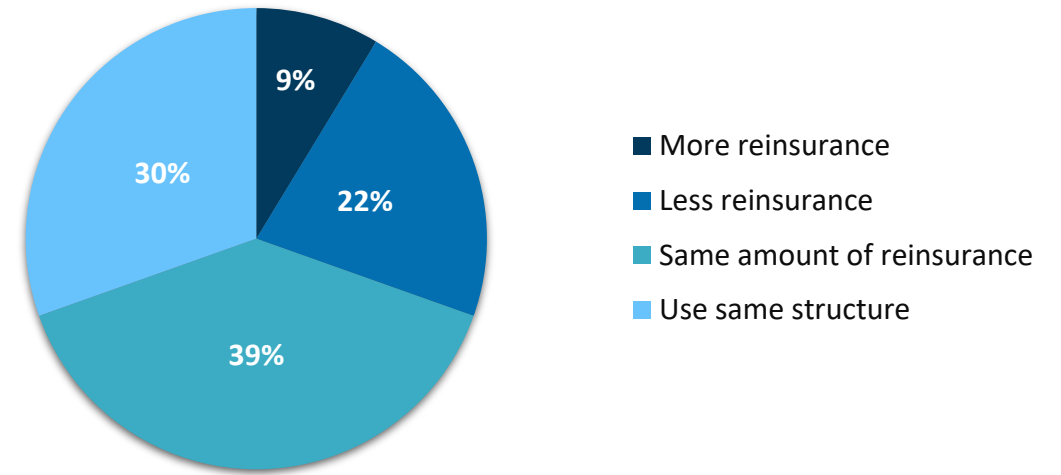
# Plan to model assets under PBR

- About half of the participants indicated they plan to use a single integrated model that projects assets and liabilities.
- Fully integrated asset-liability model increases the complexity of the valuation process.



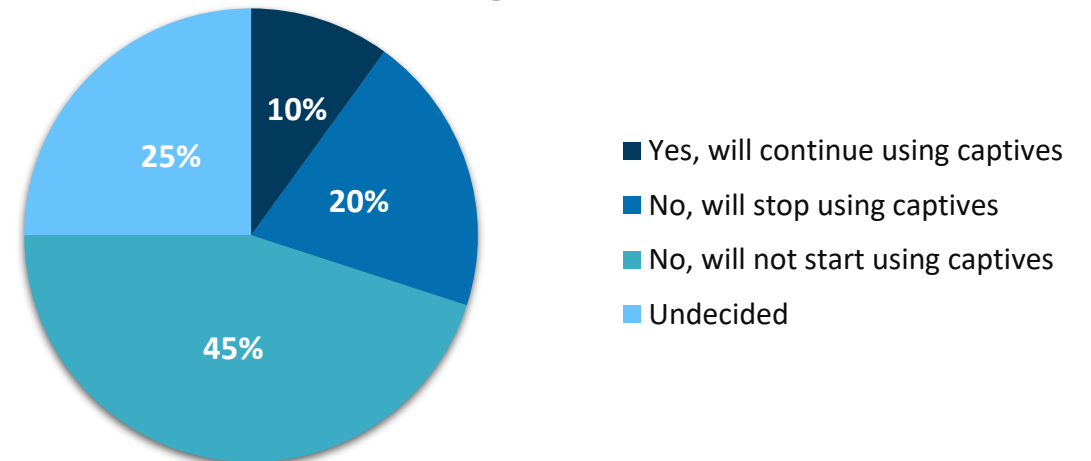
# How is reinsurance expected to change under PBR?

- Nearly 70% of survey respondents are not expecting reinsurance to be changed under PBR
- Most plan to have either the same amount of reinsurance or use the same structure

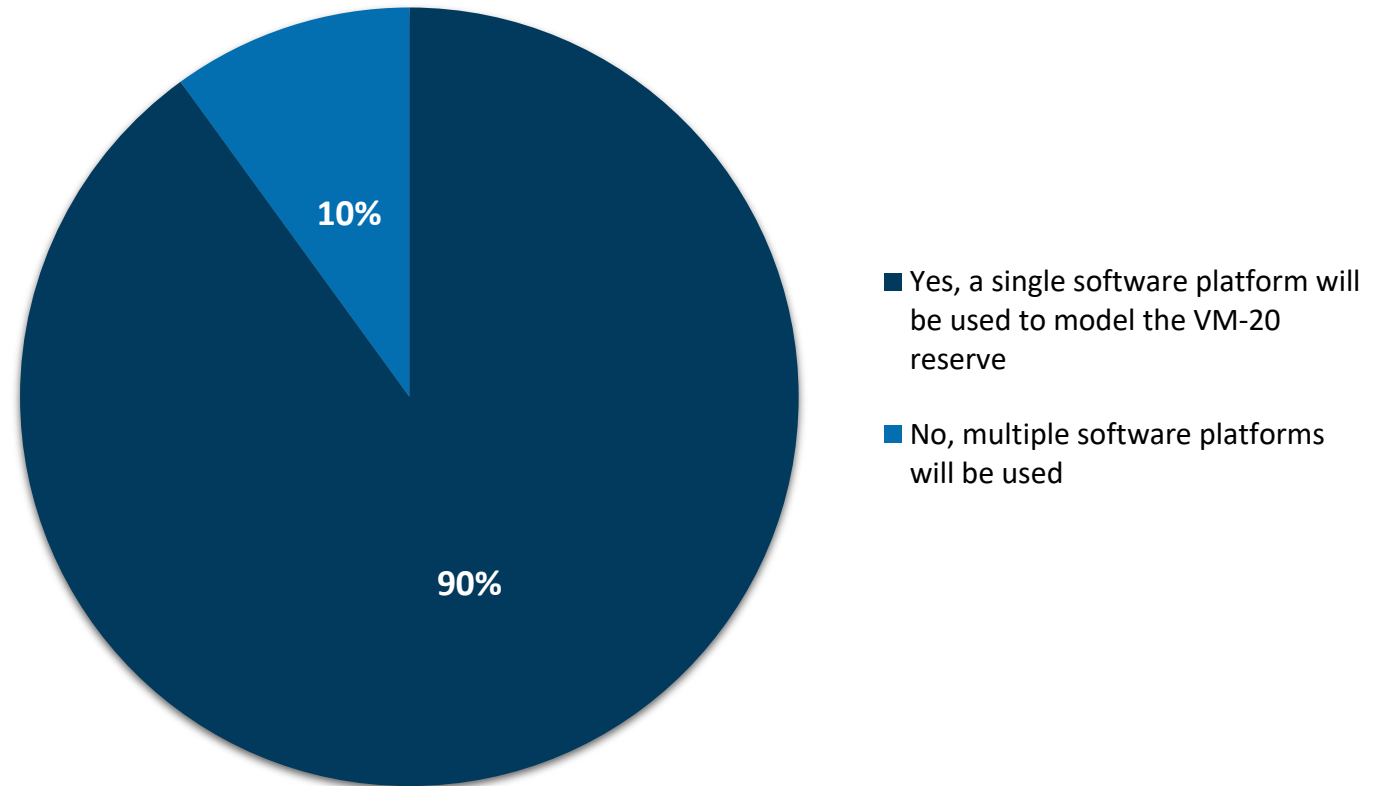


# Is financial/captive reinsurance expected to change with PBR?

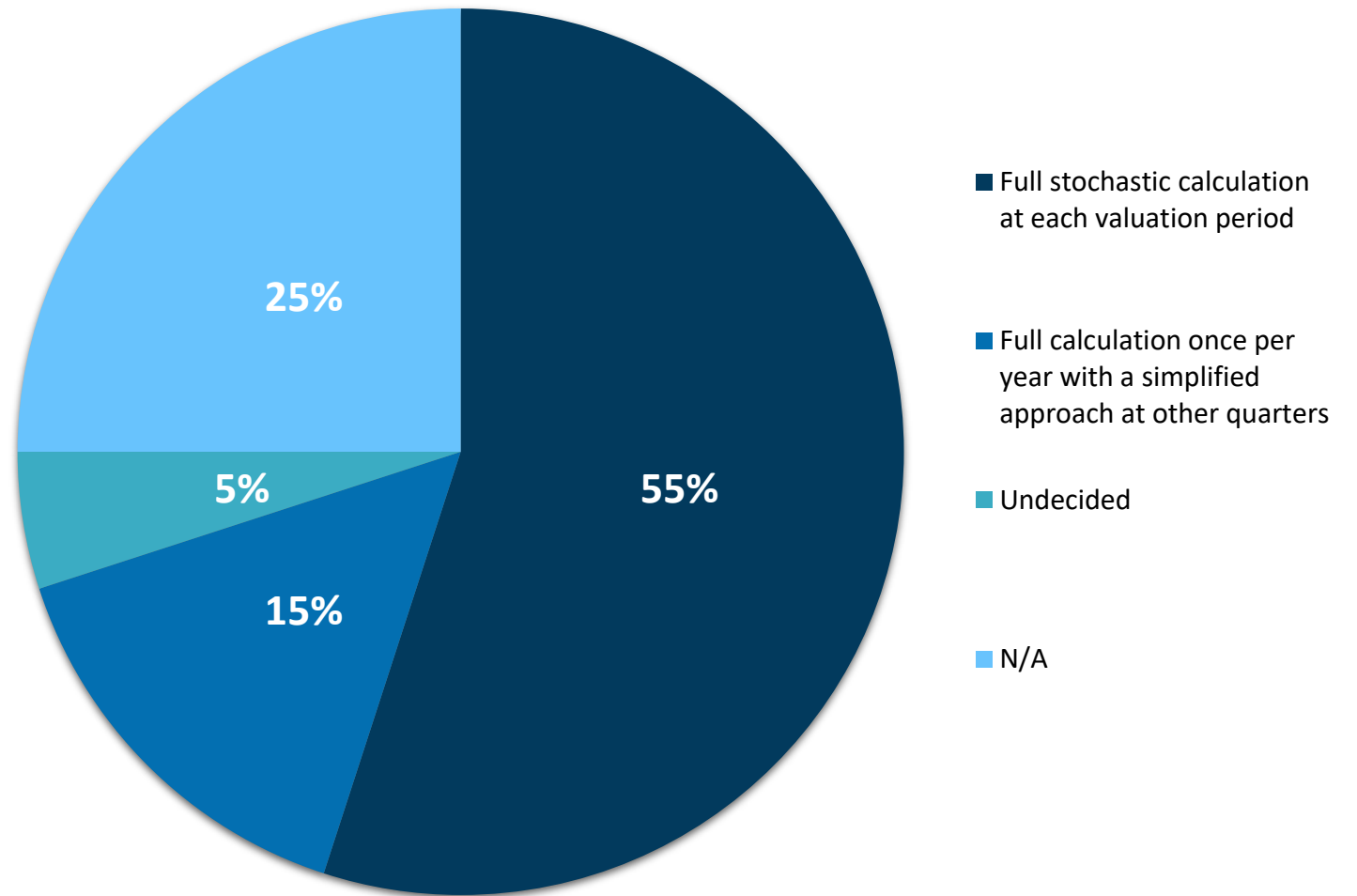
- One of the original intentions of a principles based framework was to reduce reliance on reinsurance captives
- Survey indicated that companies are still evaluating their planned use of reinsurance
- 25% of companies responded that they would stop using captives.



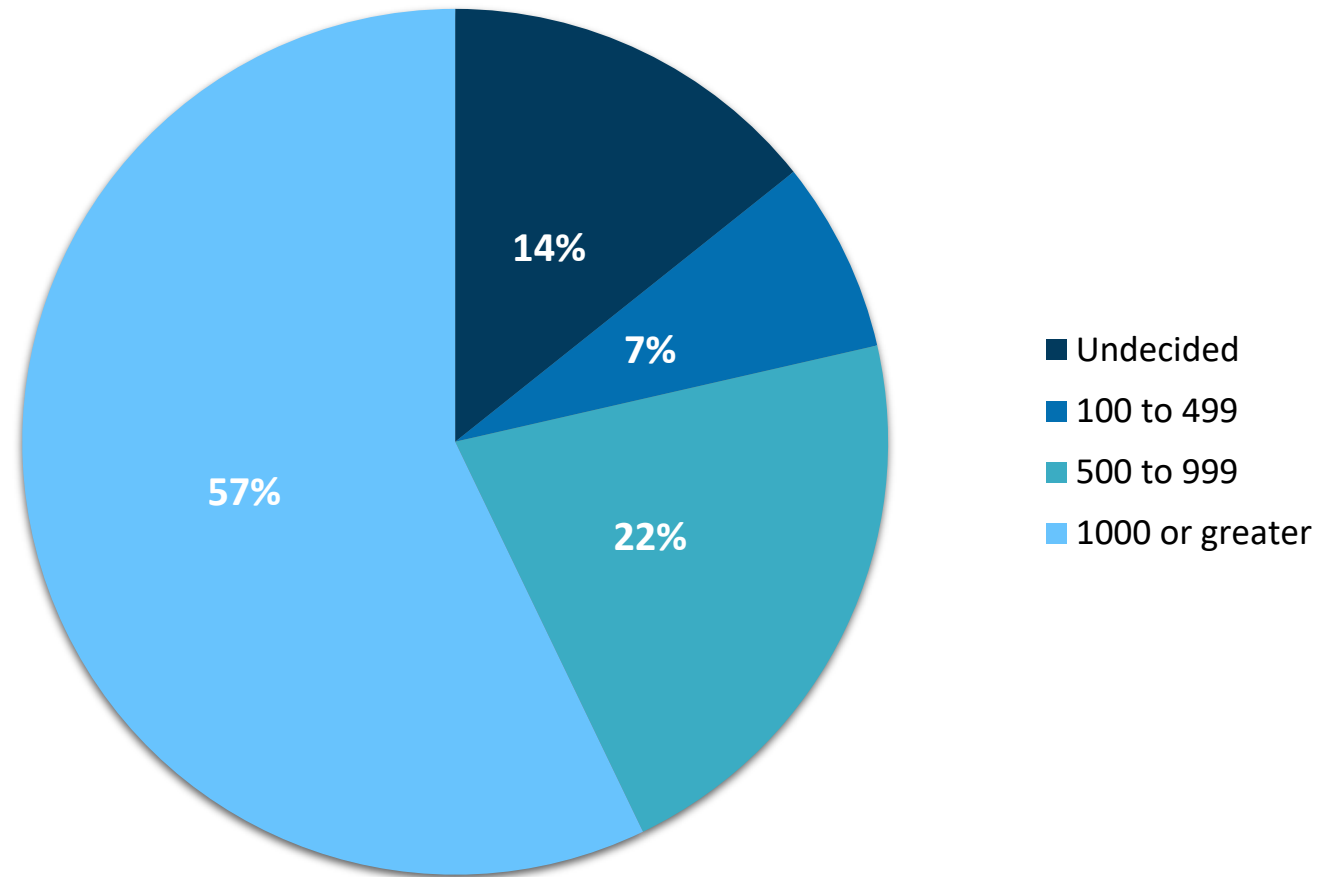
# Will a single software platform be used for all components of the reserve?



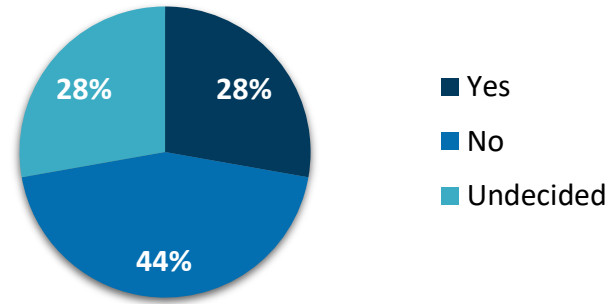
# Approach for calculating the stochastic reserve



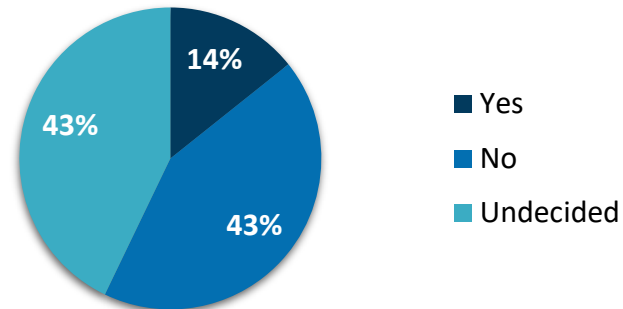
# How many scenarios are planned to be used for the stochastic reserve?



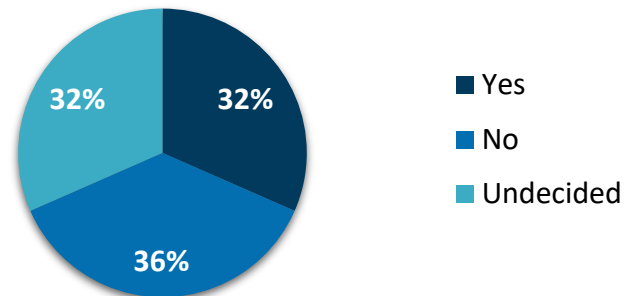
## Modeling term conversions in deterministic and stochastic projections



## Include whole life term riders that have not been refiled with CSO 2017 in PBR valuation



## Modeling any riders with the base policy in the NPR calculation

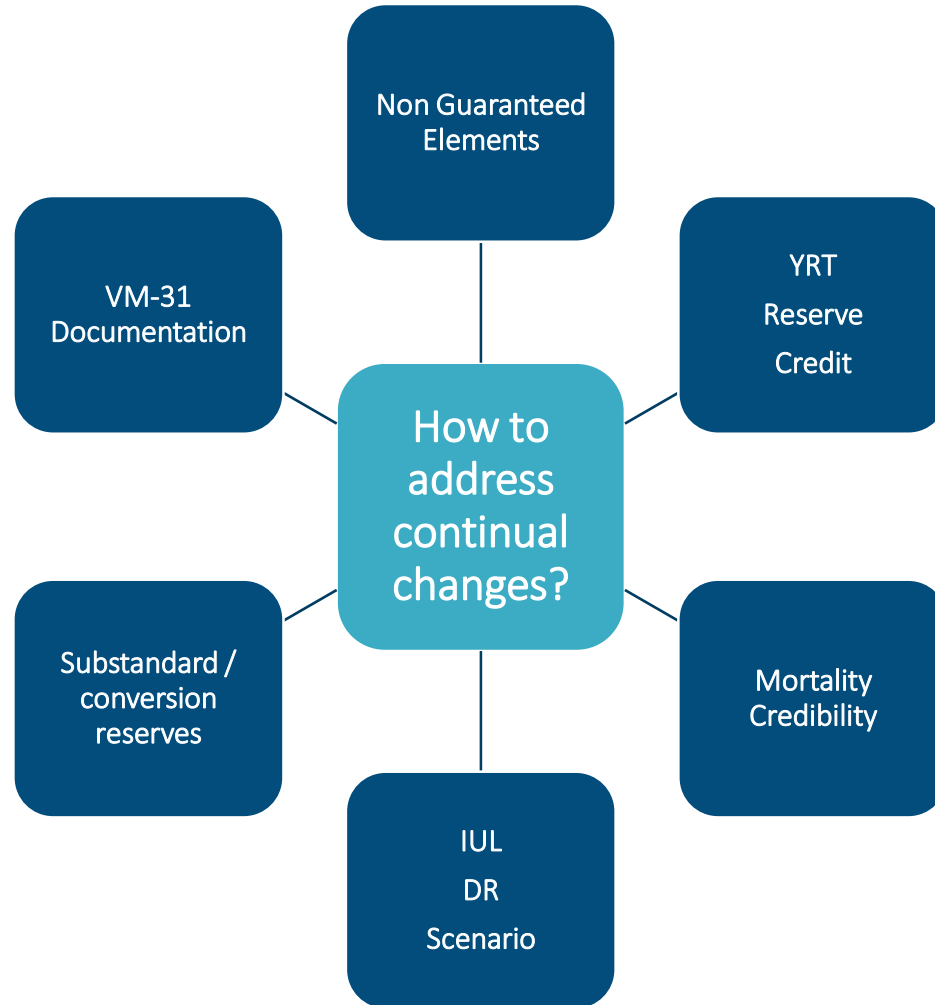


# Emerging Issues





# Emerging Issues



Questions?

