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Principle-Based Reserves Veni, Vidi, Vici

February 14, 2016



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Principle-Based Reserves

Agenda

- PBR Summary and Timeline
- Where to start
- Implementation aspects
 - Exclusion tests and grouping
 - Net premium, deterministic and stochastic reserves
 - Assumptions
 - PBR actuarial report
 - Governance
 - Tax reserves
- Company Initiatives

Principle-Based Reserving (PBR)

A fundamental change in statutory reserves

- VM-20 Reserve Concepts
 - Reserve calculation will be based on own company experience
 - Method based on principles and guidance (not formulaic)
 - Margins added to each assumption for conservatism
- Requires a significant amount of effort
 - PBR reserve is the greatest of a net premium reserve, deterministic reserve and stochastic reserve
 - Current valuation systems may not be easily adapted to PBR
 - Extensive reporting and documentation requirements
- As of June 30th, forty-five states¹ have adopted PBR legislation (Models 808 and 820) representing 79.5% of gross premium – NY has indicated a 2018 adoption
- January 1, 2017 will be the effective date

Excludes territories

PBR: How VM is being implemented

Revised Standard Valuation Law* references the NAIC valuation manual

* Enacted by state legislation

Updated by NAIC Adoption

Valuation Manual

VM-01 – Definition of Terms

VM-02 – Minimum NF Mortality & Interest

VM-05 – NAIC Model Standard Valuation Law

VM-20 – Requirements of PBR for Life Products

VM-21 – Requirements for PBR for VA

VM-22 – Requirements for PBR for non-VA

VM-25 – Health Insurance Reserves – Minimum Requirements

VM-26 – Credit Life & Disability Reserves Requirements

VM-30 – AOM Requirements

VM-31 – PBR Report Requirements for Business subject to PBR

VM-50 – Experience Reporting Requirements

VM-51 – Experience Reporting Formats

VM-A – Appendix A Requirements

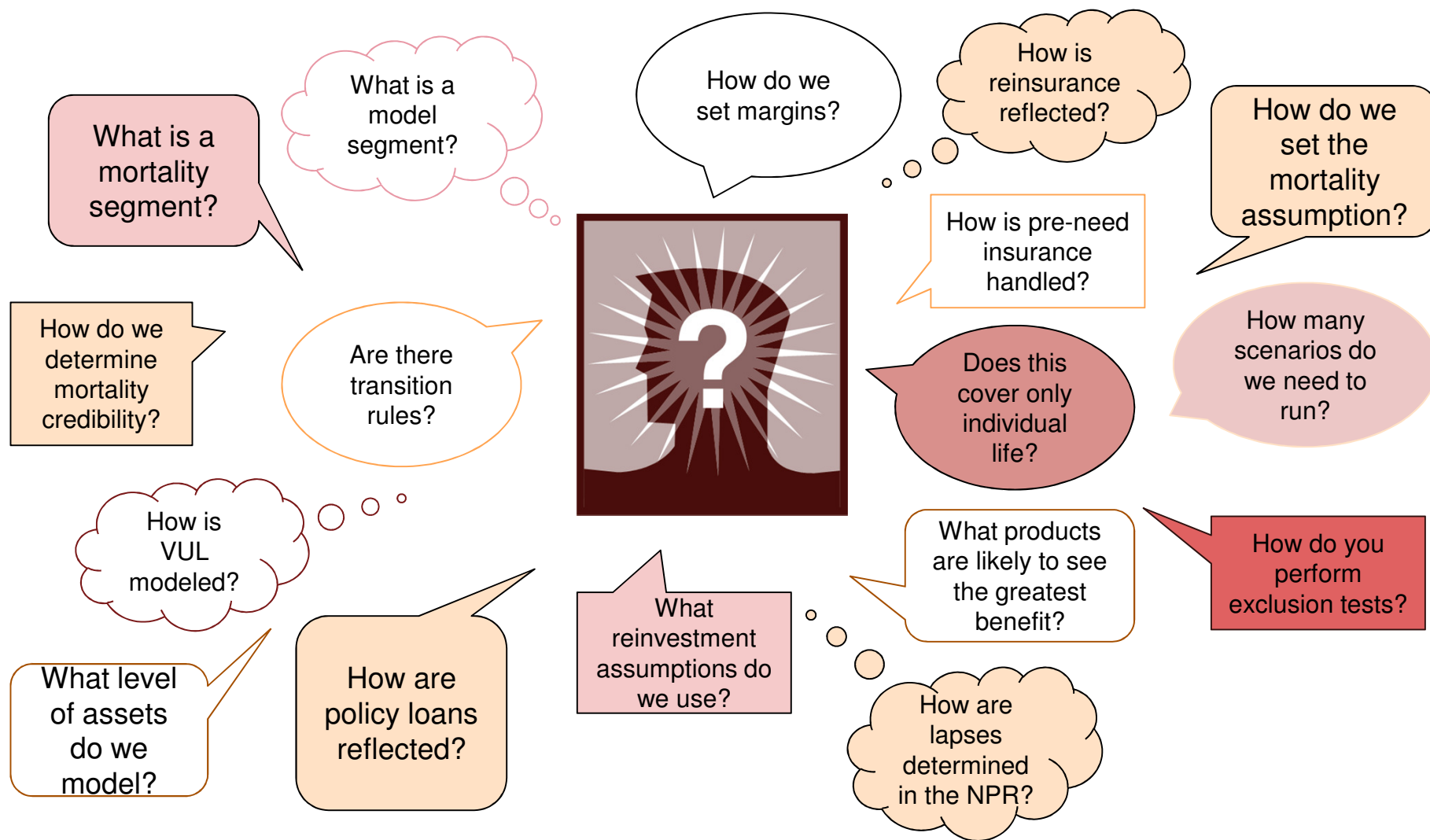
VM-C – Appendix C Actuarial Guidelines

VM-G – Appendix G Corporate Governance Requirements for PBR

VM-M – Appendix M Mortality Tables

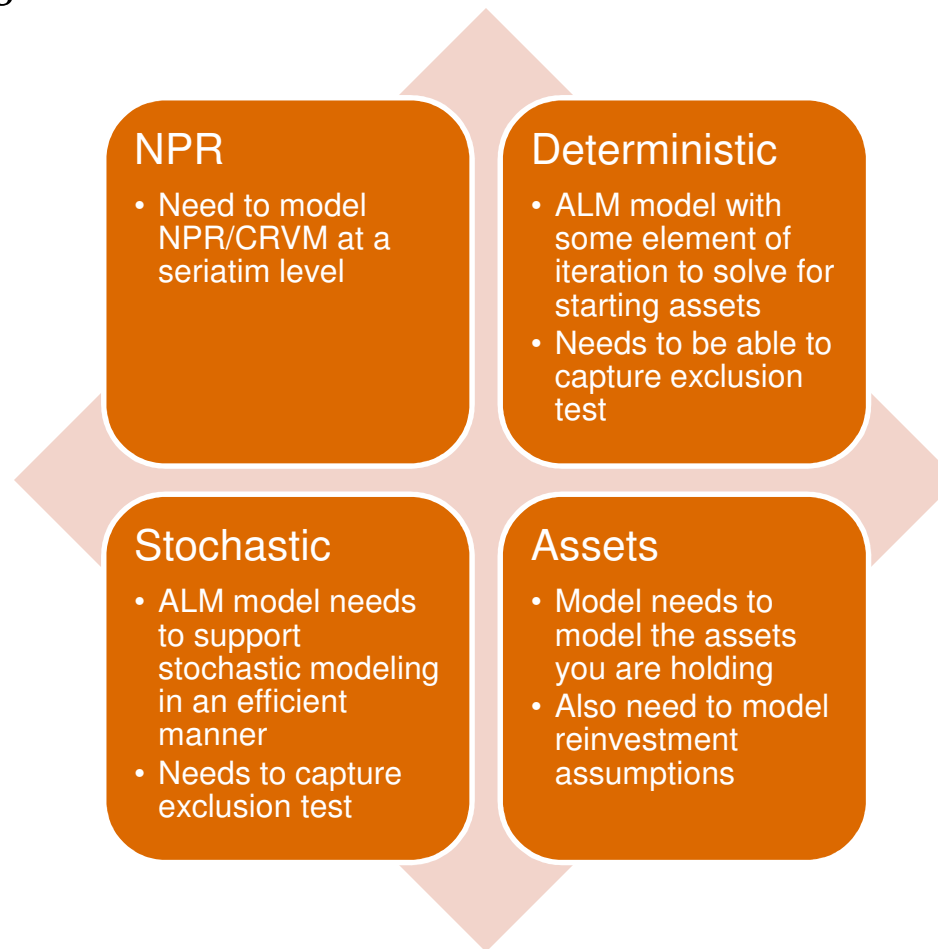
Where do I start?

PBR – VM 20 – What is it & how do we get started?



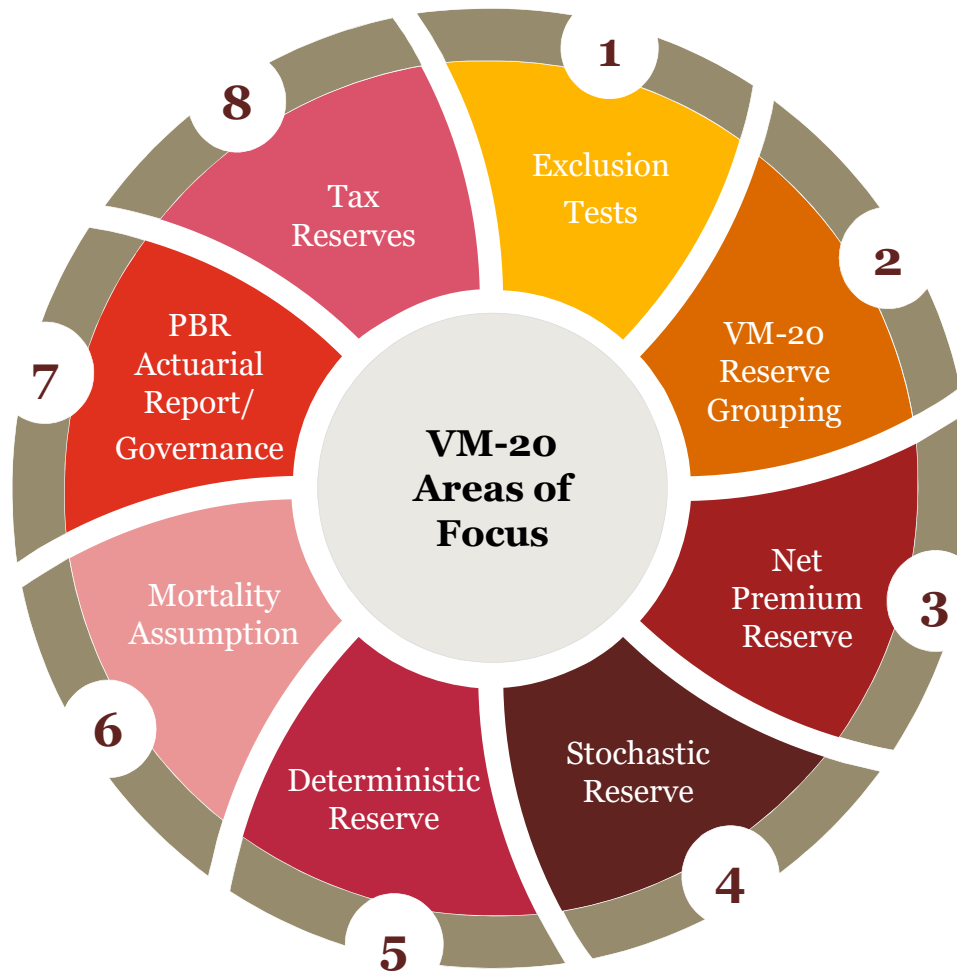
Valuation Systems

Valuation system selection has been a particular discussion point amongst clients

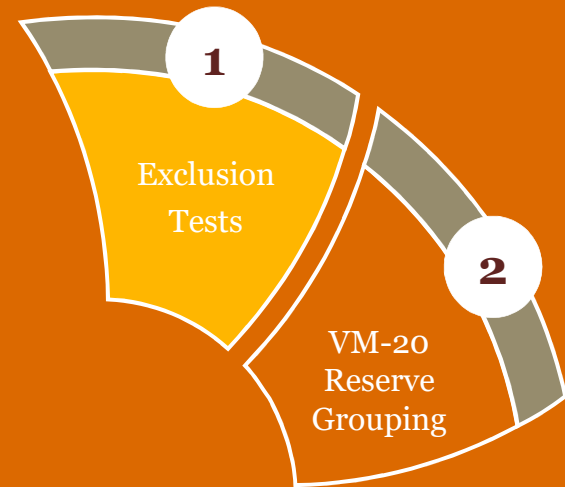


VM-20 Valuations

Certain Implementation Considerations



VM-20 Reserve Groups



Minimum Reserve Under PBR

Determined by comparing reserves computed under 3 bases
Could Hold $\text{Max}[\text{NPR}, \text{DR} + \text{DPA}, \text{SR} + \text{DPA}]$

Net Premium Reserve (NPR)

- Minimum reserve
- Prescribed assumptions
- Seriatim
- Cash value floor

Deterministic Reserve (DR)

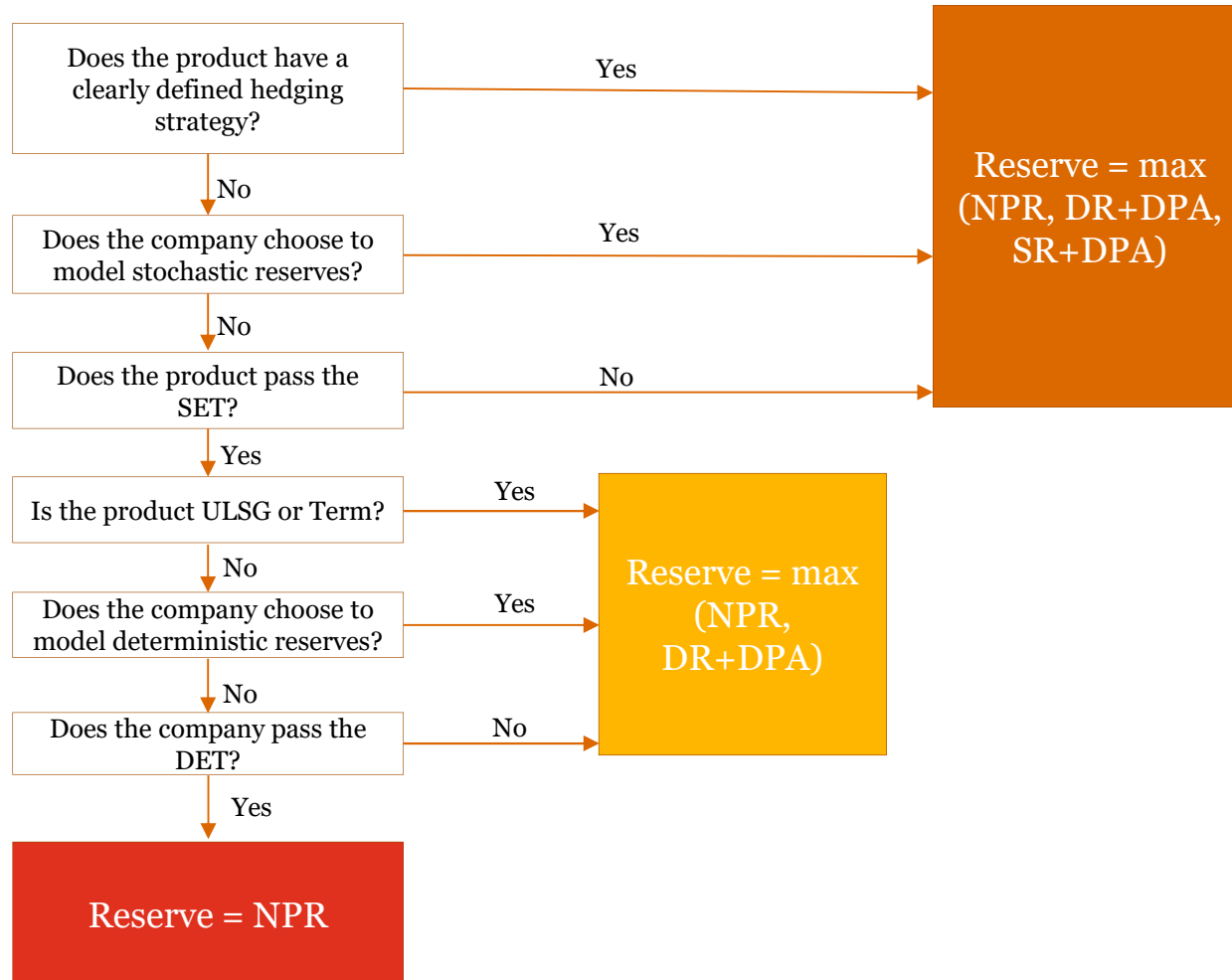
- Calculate if fail deterministic or stochastic exclusion tests or ULSG or employ clearly defined hedging strategy
- Gross premium reserve
- Mix of best estimate and prescribed assumptions
- Determined in aggregate under single scenario
- Discount rate = path of net asset earned rates for model segment

Stochastic Reserve (SR)

- Calculate if fail stochastic exclusion test or employ clearly defined hedging strategy
- Greatest present value of accumulated deficiency
- Mix of best estimate and prescribed assumptions, including dynamic policyholder behavior
- Determined in aggregate, multiple scenarios
- Discount rate is prescribed = 105% of 1-year Treasury rate
- Equals average of highest 30% of resulting reserves (CTE 70)

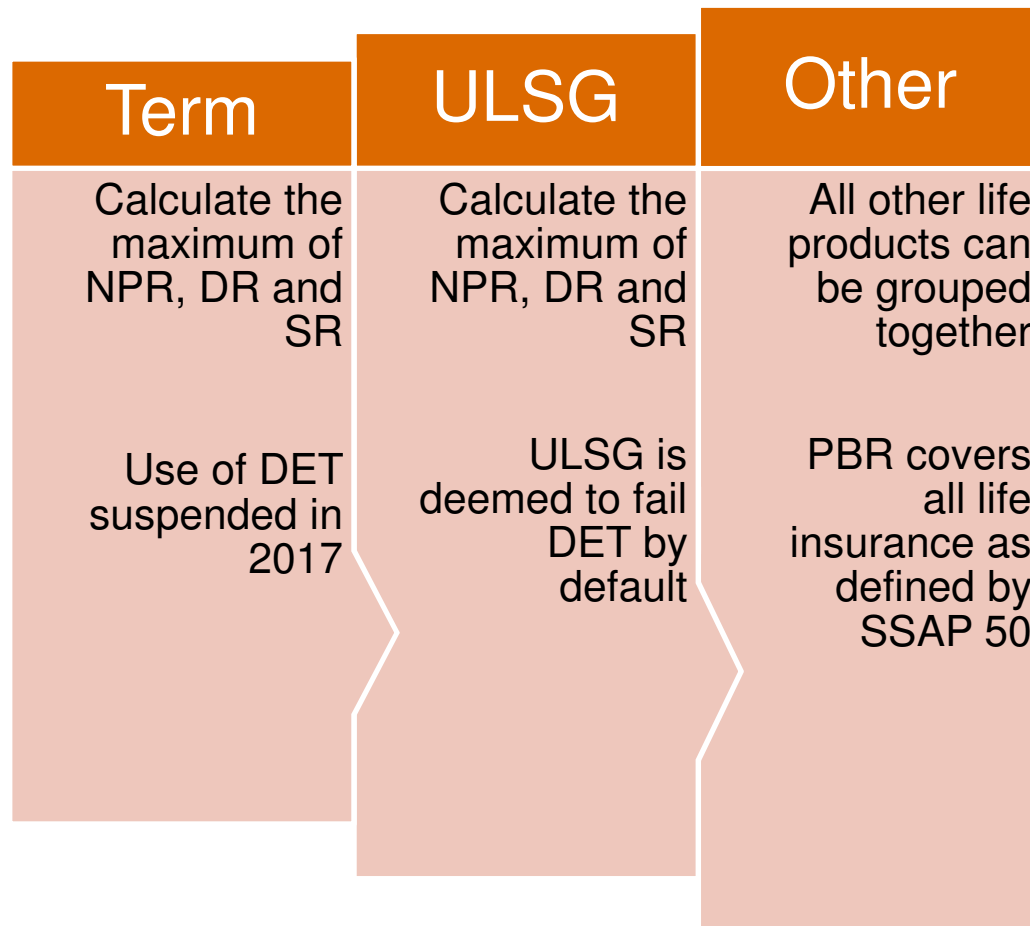
DPA = Due & Deferred Premium Asset

Decision Tree for Determining Required Reserve Computations

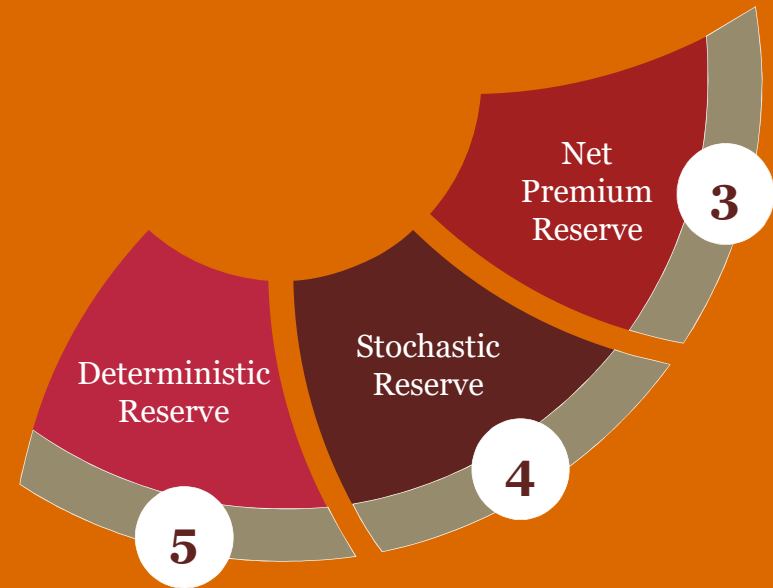


Reserve Grouping – Term & ULSG

LATF has proposed limits on grouping related to these two products



VM-20 Reserve Method



*Net Premium Reserve,
Deterministic Reserve, and
Stochastic Reserve*

Net Premium Reserve – Term & ULSG

General

VM-20 Net premium reserve is fully prescribed

- The net premium reserve calculation differs for term and ULSG
- Higher interest rate for term without non-forfeiture benefits and UL with secondary guarantee (SG)
- Unique formulas for term with and without shock lapses and for UL with and without SG
- Lapses are a component of the methodology
- Higher expense allowance than current CRVM
- Actuarial present value of benefits equals the PV of future benefits, including death, endowment, and cash surrender benefits. Future benefits are before reinsurance and policy loans.

Common elements for Term & ULSG

When determining the NPR

**2001 or 2017 CSO Mortality
Interest rate formula***

*** Minor differences exist**

Different elements for Term & ULSG

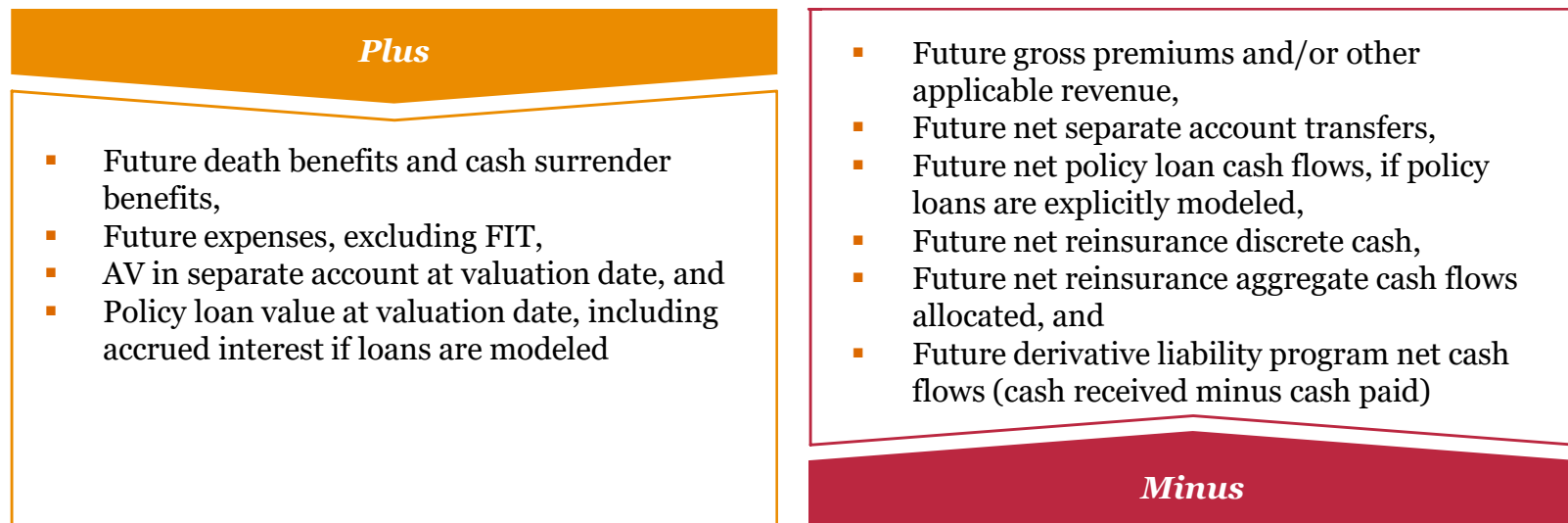
When determining the NPR

**Lapse rates
Methodology**

Deterministic Reserve

General

- Seriatim reserve
- Cash flows discounted at Net Asset Earned Rate for scenario #12 of the 16 scenarios defined for SERT
- Gross Premium Reserve (GPR) defined as the actuarial PV of:



- Reflects prudent estimate assumptions
- If simplifications, approximations, or modeling efficiency techniques are employed, a company must be able to demonstrate that the seriatim reserve is not materially different than the grouped reserve for the DR calculation.

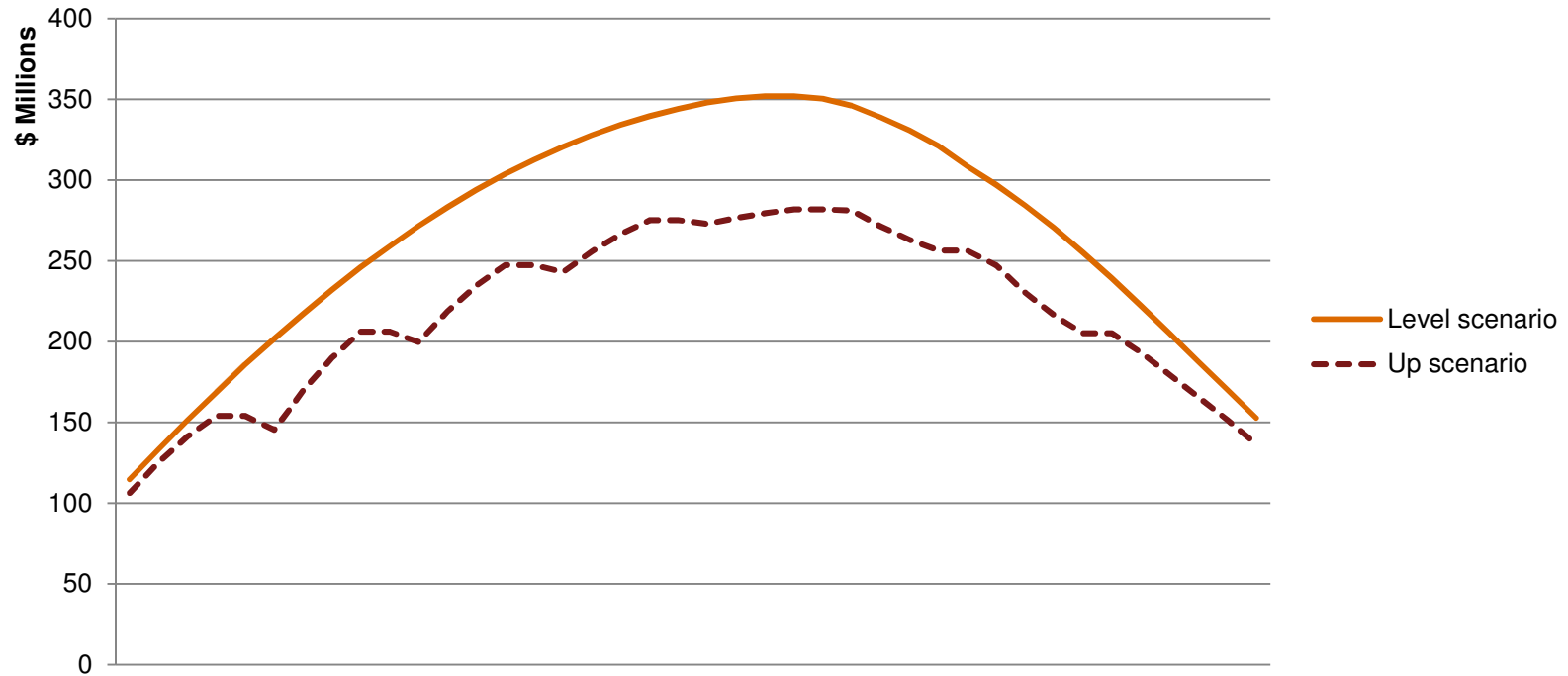
Stochastic Reserve

General

- For a given risk subgroup, the stochastic reserve is calculated by reflecting:
 - The aggregate of the Greatest Present Value Accumulated Deficiency (GPVAD) for each scenario, where the Accumulated Deficiency is defined as the negative of the projected assets
 - PVs are calculated using prescribed discount rate equal to 105% of the scenario specific one-year treasury rate
 - Scenario reserve = Starting assets + GPVAD
 - The stochastic reserve is the CTE 70 of the scenario reserves
- Add together the stochastic reserves for each risk type subgroup for which the reserve held is the $\text{Max}[\text{NPR}, \text{DR}+\text{DPA}, \text{SR}+\text{DPA}]$
- Term and ULSG stochastic reserves need to be calculated separately

PBR Modeling

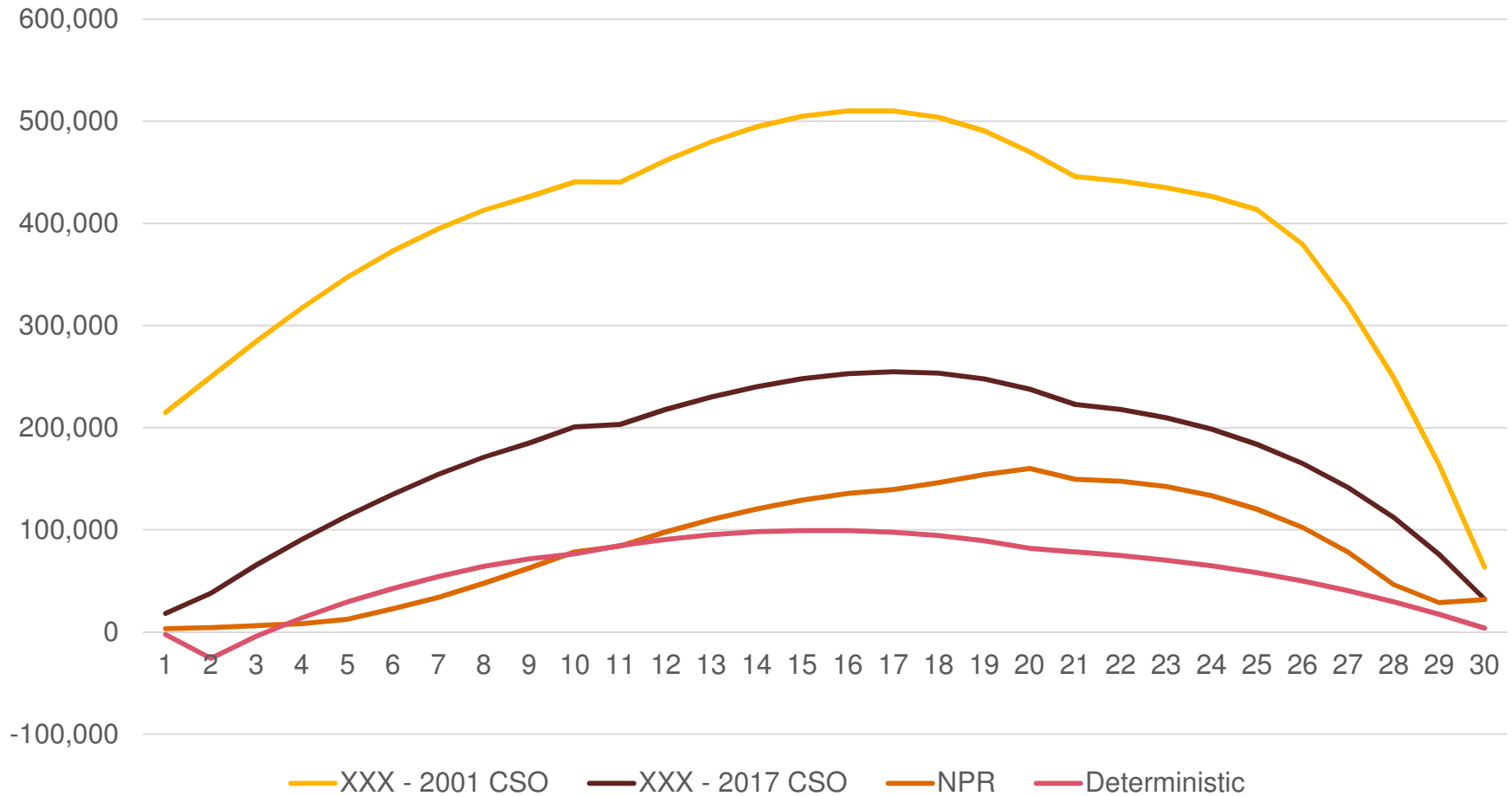
SGUL Reserves – One Year of Issue



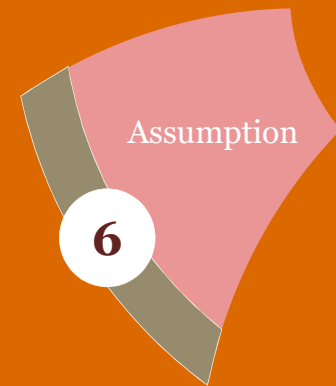
- Future SGUL reserves will vary from initial pattern
 - Interest rate environment
 - Mortality improvement
- Will also depend on investment strategy

Projection of reserves for term block

Aggregate STAT reserves - Rsv = 0 after LT Period



Deterministic & Stochastic Reserves – Assumption



Assumptions – General

Types of assumptions

- Prescribed
- Stochastically Generated
- Prudent estimate assumptions

Explicit margins

- Determine independently for each material assumption initially, and then, if applicable, adjust to take into account that risk factors are not normally 100% correlated.
- Must demonstrate reasonableness of the adjustment.
- Reflect magnitude of historical fluctuations in the risk factor
- Apply method consistently each year. Permitted to change method but must disclose the rationale and modeled reserve impact.

Prudent estimate assumptions

- Anticipated experience plus a margin
- Based on relevant and statistically credible available company experience or other relevant and statistically credible experience
- Apply credibility theory if applicable
- Provide margins for uncertainty, including adverse deviation and estimation error, such that the greater the uncertainty the larger the margin and resulting reserve
- Periodically sensitivity test to understand materiality of prudent estimate assumptions on the minimum reserve. Update less frequently if impact is immaterial and assumption is not changing.
- Requires appointed actuary review of emerging experience to set anticipated experience assumption.

Material assumptions

Prescribed

- Mortality
- Interest
- Equity returns
- Defaults
- Reinvestment spreads

Prudent estimate

- Morbidity
- Expenses
- Lapses
- Partial withdrawals
- Loans and
- Option elections

PBR Actuarial Report/Governance



VM-31 PBR Actuarial Report

- Two major parts to the report. The overview must be filed with the domiciliary commissioner by April 1 each year.

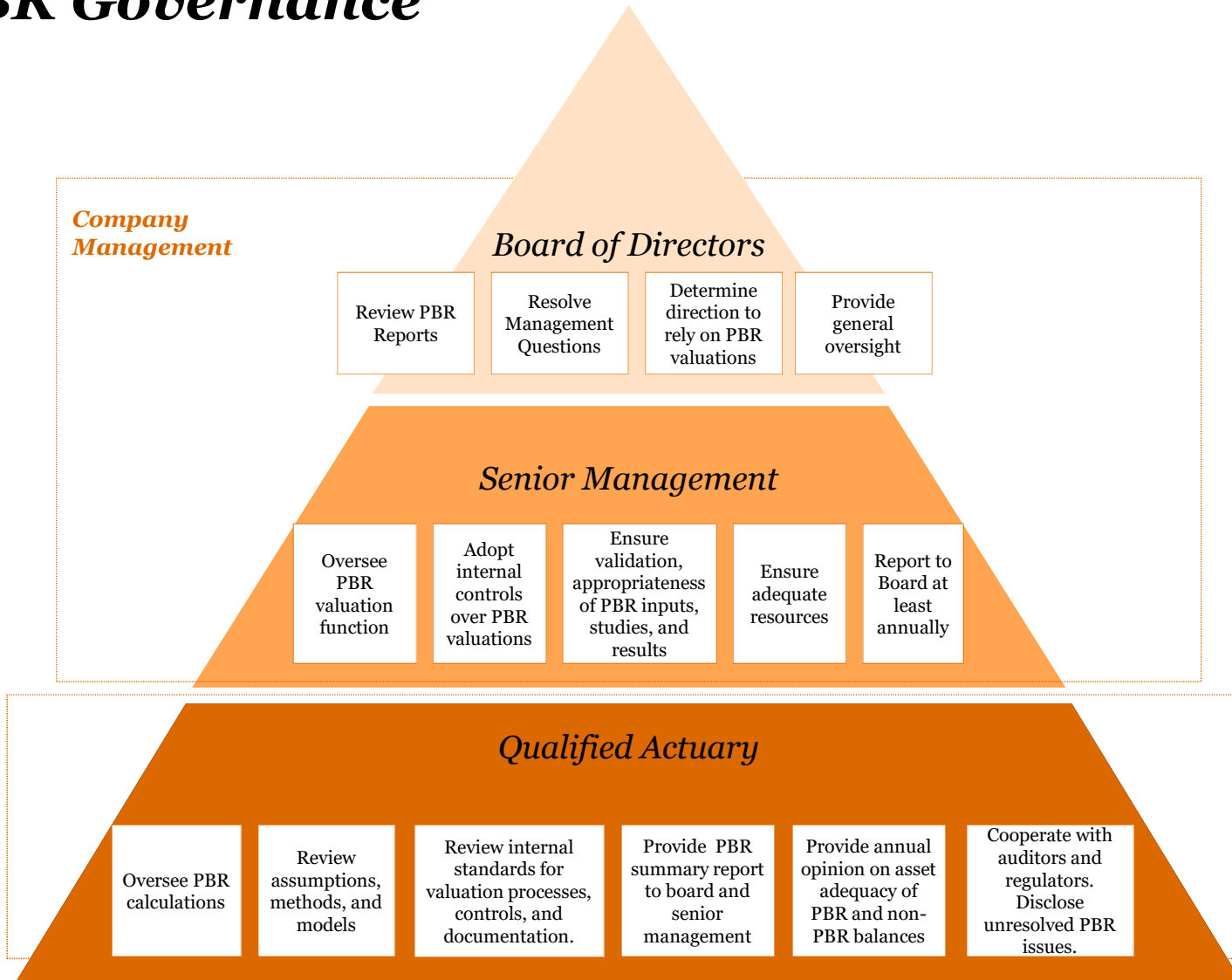
Overview Section

- Key statistics by product type
- Description of material risks
- Part 1 and Part 2 Section 1 of the annual statement blank
- Reliance statements
- Summary of valuation assumptions and margins for each major PBR product line
- Summary of modelling methodology for assets, liabilities and reinvestment assumptions (including any management action)
- Description of how materiality is determined as it relates to decisions, information, assumptions, risks, or other elements of PBR. Relate to % of surplus, % of reserves, or \$ value.
- Certification paragraph that reserves comply with VM-05 and VM-20 and that assumptions and margins are prudent estimates.

- Summary of results
- Documentation of assumptions
- DET & SET
- Describe model segments
- Describe validation of model calculations
- Describe mortality segments & rationale for policy selections
- Describe rationale for credibility method
- Provide experience study results every 3 years for mortality and policyholder behavior
- Describe policyholder behavior margins and sensitivity test used to determine the margins
- Describe how changes in NGE impact policyholder behavior
- Describe changes in anticipated experience assumptions or margins since last PBR Actuarial Report

Other Sections

PBR Governance



Tax Reserves



PBR Tax Considerations

Overview of Tax Reserves for Life Insurance Contracts

Straightforward framework, devil in the details

- Federally Prescribed Reserve based on
 - CRVM in effect when the contract was issued
 - Prevailing mortality tables
 - Prevailing interest rates (AFR if greater)
 - No deficiency reserves
- Cap equals statutory reserve
- Floor equals contract net surrender value
- Calculations are performed contract-by-contract

PBR Tax Considerations

Tax issues presented by PBR

Some issues already identified (but not answered) by IRS

- For Net Premium Reserve
 - How will reserves be computed for companies that elect 3-year transition and other special rules?
- For Deterministic Reserve
 - Will IRS allow a Gross Premium Reserve methodology?
 - What are prevailing mortality tables if company uses own mortality?
- For Stochastic Reserve
 - Will IRS allow reserve that is not seriatim?
 - How will factors that are not prescribed be taken into account?

PBR Tax Considerations

Tax issues presented by PBR, cont'd

Some issues already identified (but not answered) by IRS

- For Cap on deductible reserves
 - Will IRS treat Stochastic and Deterministic Reserves as life insurance reserves despite use of non-prescribed factors?
 - Same issue for testing whether a company is taxed as a life or nonlife company?
- For Life Insurance Contract qualification
 - What are prevailing mortality tables in situations where a company may use its own experience rather than industry tables?

PBR Tax Considerations

Further IRS Guidance?

Prospects are limited

- IRS provided interim guidance on AG 43 in 2010, highlighted a number of issues but did not follow up
- In response to industry requests, IRS and Treasury Department's Priority Guidance Plan anticipates guidance on both Life PBR and AG 43, in particular concerning the treatment of stochastic reserves
- As a practical matter, limited resources at IRS and Treasury mean it is possible – even likely – there will be no tax guidance concerning the implementation of Life PBR

Company Initiatives Related to PBR

Challenges in Implementing PBR

Technical requirements

Companies face many technical issues in implementing PBR including:

- Scoping – performance of deterministic and stochastic exclusion tests
- Assumption setting – based on own company or industry experience, or prescribed amounts
- Margin setting – for each of the major assumptions based, in part, on sensitivity testing
- Scenario generation – for asset and liability modeling
- Asset modeling – including current portfolio and reinvestments
- Liability modeling – of dynamic policyholder behavior
- Grouping – of experience and model cash flows

Challenges in Implementing PBR

Company functions impacted

Company actuaries are not the only resources impacted by PBR:

- Financial reporting – additional reporting and disclosures
- Investments – modeling assets and strategies
- Information technology – access to data and computing power
- Risk management – assumption governance and model validation
- Executive management – oversight and Board communications

It is necessary to communicate with and engage many stakeholders in order to effectively implement PBR

Challenges in Implementing PBR

Management information

Financial planning and analysis will be very different under PBR:

- Statutory profit signatures under PBR will be different
- Potential for more volatility in statutory earnings (and capital)
- Company business plan projections may have to incorporate stochastic processes
- Key performance indicators and attribution analyses will be very different under PBR
- Senior management and the Board are likely to need additional instruction on changes in potential profit emergence, increased volatility and range of expected outcomes

PBR Business Implications

Something for everyone!

- Executive Management: Provide oversight and resources
- Financial Reporting: Changes to the Statutory Blanks to incorporate PBR
- Finance: Forecast and explain changes in statutory reserves, more volatility in statutory earnings and surplus
- Investment Accounting: Investment data requirements; potentially more portfolios / segments
- Tax: Tax reserves during transition and after implementation of PBR
- Investments: Investment policy development and monitoring
- Risk Management and Governance: Validation of PBR models. Assumption and margin governance.
- Internal Audit: Review of processes and controls
- Product Development: Product changes, “right-sized” reserves with greater future uncertainty
- Information Technology: New data requirements, processes, computing capacity
- Human Resources: Race for experienced actuarial talent
- Valuation: Aggregate, calculate, articulate, repeat

Modeling Considerations for Implementation

Common issues for PBR implementers

1. Product combinations under PBR and how this fits within a company's investment allocation framework
2. Companies struggling with modeling reinsurance (especially YRT), reinvestments, simplified underwriting and dynamic lapse experience
3. Strategic decisions have focused on tax reserves and product grouping
4. Limitations of current valuation, modeling, and administrative system
5. Margin setting (and evaluation of the conservatism of total margins) has been a focus of many clients as management approaches PBR

Thank you

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