

# **Principles-Based Reserves — Theory and Practice**

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**Actuaries' Club of the Southwest  
Southeastern Actuaries Conference  
Joint Annual Meeting**

**November 16, 2006  
Doug Doll, Towers Perrin**

# Agenda

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- Why now?
- Theory: Principles
- Practice: Basic framework
- More practice: Procedures, assumptions, scenarios
- Prognosis for adoption

## **Why now? Because the formula-based system is sufficiently broken and actuarial practice has evolved**

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- The patchwork of regulations and actuarial guidelines cannot keep up with changes in products and a more dynamic marketplace — concerns about inadequate reserves, e.g., with new product guarantees
- Excessive reserves in certain areas led companies to look for loopholes
  - Prompting Regulation XXX and AG38
- Elements of “principles-based” started to creep in
  - C3 Phase I, C3 Phase II, X-factors
  - But, none of these affected basic reserves
- Stochastic modeling for reserves and capital is becoming more common

## **C3 Phase II started the initiative; AG38 gave it urgency**

- C3 Phase II for RBC led naturally to an extension for reserves
- Issues with life reserving led LHATF to ask the Academy in March 2004 to recommend SVL2 approach
- “Compromise” AG38 adopted in late 2005 significantly increased reserves for the latest ULSG designs, but scheduled this formula to sunset on April 1, 2007
  - Drafting note: “The “sunset” of April 1, 2007 creates a sense of urgency that will drive all concerned to work toward the quick development of a “principles-based” valuation methodology or, as an interim step while continuing to work on such methodology, to adopt a more readily achievable solution that provides relief from overly conservative levels such as a change to valuation mortality requirements”
- A UL Working Group had been formed in late 2004 to consider a “C3 Phase II” for UL
  - In 2005, added other life products (changed name to LRWG), developed principles, exposed draft regulation and AGs
  - In 2006, continues to refine regulation and AGs
- In addition, there are annuity and long-term care groups

## **Key goals of the new Principles-Based Approach (“PBA”) framework**

- An appropriate level of conservatism in establishing and maintaining solvency
- A consistent and integrated risk measurement and governance process in setting capital and reserves on a total balance sheet basis
- An auditable, verifiable and justifiable risk management process
- Flexibility to address all lines of business and to accommodate evolving risks
- Uniformity in national standards and compliance review across all states
- Effective utilization of resources

Source: American Academy of Actuaries

## Definition of PBA

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- Captures all of the identifiable, quantifiable, and material risks, benefits, and guarantees associated with the contracts, including 'tail risk' and the funding of the risks
- Utilizes risk analysis and risk management techniques to quantify the risks. This may include stochastic models.
- Incorporates assumptions and methods that are consistent with those used in the overall risk management process
- Permits the use of company experience to establish company-specific assumptions for risks over which the company has some degree of control or influence
- Provides for the use of assumptions set on a prudent best estimate basis that contain an appropriate level of conservatism when viewed in the aggregate

## **New valuation law authorizes key elements of framework**

- Effective date
- Valuation manual that gives details of reserve calculations (details proposed for life insurance discussed later)
- Independent peer review
- Required experience reporting

There are other support structures for PBA being developed: e.g., Governance and ASOPs

## Peer review proposal has some issues yet to be resolved

- Academy's PBA Review and Governance Work Group (Shirly Shao, chair) has a draft model regulation to require independent review of PBA methodology and assumptions (not data and calculation accuracy)
- Reviewer hired by Board (may be disapproved by commissioner)
  - Report due 30 days after statement date
  - Opinion filed, report available to regulators on request
- Issues include the following
  - Can auditors be reviewers?
  - Should reviewer's opinion be confidential?
  - Industry concern about how this fits into broad picture (does it substitute for other oversight such as examination?)

## **Governance issues are being addressed by multiple groups**

- Academy's Other Governance and Regulatory Interface Team, chaired by Donna Claire
  - Objective: Clarify the roles and responsibilities within a company with respect to PBA reserves and capital, and ensure appropriate coordination with other internal management processes
  - Subgroups
    - Valuation Law and Manual Team (Mike Boerner)
    - Central Actuarial Examiner Team (Larry Brunning)
    - Other Governance Issues (Helen Galt)
- LHATF/CADTF Task Force has proposed a model law and regulation pertaining to “corporate governance for risk management” (in early stages of development)

## **A working draft of a possible ASOP for principles-based reserves was presented at the September NAIC Meeting**

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- Bob Meilander, chair of ASB Life Operating Committee, highlighted that ASOP is focused on “should consider . . .” and “may do . . .”
- Some regulators would prefer “must do . . .” guidance and specific criteria, but this is function of laws and regulations, not of the ASB

## **PBA Life Reserves Proposal is described in a model regulation and two actuarial guidelines**

- Principles-Based Reserves for Life Products Model Regulation
- Actuarial Guideline PBR-VAL: “Determining Valuation Assumptions for Principles-Based Life Insurance Products”
- Actuarial Guideline DIS: Documentation and Disclosure Requirements When Determining Reserves Based on the Principles-Based Life Reserves Model Regulation

The LRWG maintains these drafts — most recent versions presented to NAIC in September, but revisions will be submitted in December

## **Guiding Principles for PBA Life Reserves Method (from Model Regulation)**

- A prospective valuation that captures all material risks . . . . (see PBA Principle #1)
- Can be applied to all individual life products
- Deterministic approach may be sufficient for certain products, and additional stochastic for other products
- For risks that the company has some degree of control over, assumptions should reflect a blend of company experience and prescribed assumptions (or methods for setting the assumptions)
- Assumptions not stochastically modeled should incorporate appropriate margins
- Assumptions are not locked in at issue
- Models have limitations — the actuary should take this into account. Also, assumptions and strategies should be appropriate and not constructed to materially reduce reserves without reducing risk

## Basic Framework – Life

- Scope: all Individual Life products
  - Except credit life, industrial life, pre-need, final expense, and traditional group
  - May allow other exemptions with commissioner approval
- Initial approach for PBA life reserves will be prospective only. May allow retroactive application to in-force business later
- Reserve is the greater of:
  - A deterministic, seriatim, single scenario reserve calculation
  - A stochastically derived reserve using a prescribed CTE level
- There is a possibility of not doing the stochastic reserve if can demonstrate that the deterministic reserve (plus optional extra) is adequate

Since the stochastic reserve is done in the aggregate, risk offsets among contracts are recognized

## Basic Life Framework – “Prudent Best Estimate” Assumptions

- Assumptions not stochastically modeled will be based on “best estimates” plus a margin that includes a provision for adverse deviation and estimation error
- Margins will be determined by the actuary using professional judgment, subject to guidelines established by the NAIC and ASOPs
- The NAIC may prescribe numeric limits, caps or ranges on certain margins
- Required disclosure of effect on reserves of each assumption’s margin
- Mortality best-estimate assumption to be credibility-weighted average of own experience and “industry table”
  - Industry table currently 2001 VBT; a wider range of tables is being developed
  - Commissioner’s Valuation Tables will be developed for final calculations (may be needed for tax qualification)

## Basic Life Framework – Stochastic Reserves

- Stochastic scenarios used to properly capture the “tail risk” of the contract (risks that have high impact, but low probability)
- Interest rates and equity returns will be modeled stochastically
- Will use a CTE (conditional tail expectation) level that is set by regulators, such as 65 CTE
- Reserve for each scenario will be based on the Greatest PV of Accumulated Deficiencies (GPVAD)
  - GPVAD reserve = starting assets plus the greatest PV of accumulated deficiencies in any future year
- The accumulated deficiency for each year in the projection = the “working reserve” less accumulated assets (working reserve is zero?)

## Basic Life Framework – Deterministic Reserves

- Based on Gross Premium Valuation (GPV) method
- $GPV \text{ reserve} = PV \text{ of future benefits and expenses, less PV of future gross premiums}$
- Not designed to capture tail risk, but assumptions still have margins
- Subject to a cash surrender value floor on a contract by contract basis
- Based on single prescribed interest/equity scenario

## **Basic Life Framework — Economic Scenarios and Earned/Discount Rates**

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- A new interest scenario generator is being developed
  - Similar to C3 Phase I, but lower mean reversion target
  - Calibration criteria will be developed for other generators
  - Equity scenarios remain C3 Phase II
- Existing assets are projected with actuary's judgment (but disclosed market spread to Treasuries)
- Reinvestment assets will have prescribed net spreads
- Discounting is at net earned rate

## Tax Reserves in a PBA Environment

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- The ACLI said in September that they have begun a dialogue with the Treasury
  - Discussions are expected to result in refinements to the methodology to conform to federal tax laws
  - Does not necessarily hold up passage of the new law, as details are in the valuation manual
- Academy also has tax group to work with the other groups such as LRWG

## **Annuity Reserves Work Group (ARWG)**

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- Mission: To develop principles-based reserve requirements for all non-variable annuity products
  - Current list has 22 separate types
  - Deferred & immediate annuities, EIAs, GICs, structures, etc.
- September report to LHATF
  - Contains partial outline of tentative methodology
  - Conclusions on certain issues
- Five modeling teams have been set up:
  - Using ALFA, Axis, MoSes, Prophet, TAS software
- Work is well underway
  - Working towards a 2007 or 2008 implementation timeline

## New RBC model

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- Life (“C-3 Phase III”)
  - Work is well underway by Academy’s Life Capital Working Group
  - Methodology is similar to C-3 Phase II, using CTE 90 and GPVAD
- Annuity (“C-3 Phase IV”)
  - Work is just starting (“ACWG”)
  - Methodology also similar to C-3 Phase II
  - Will include all annuity products, once completed
- Common issues to both methods
  - Will apply to both in-force and new business
  - NAIC is looking to have capital models in place by mid-year 2007

**Donna Claire, chair of the Academy Life Financial Soundness/Risk Management Committee, to the NAIC in September: “We are on target to have a PBA approach ready by December of 2006 for life products”**

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- “Approach” is different than “having all the details worked out with regulators”
- VA CARVM has taken years to work out details
- It is difficult for some regulators to “let go” of specific requirements
- Small companies will request exemptions
- The most recent version of AG38 (adopted this September, with lapse rates for ULSG) has a sunset date of 1/1/2011, considered a reasonable time for principles-based reserves to be effective