FORTITUDE RE

Model Build Lessons Learned

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Speaker Bio

Valerie Smeshko is the Vice President, Life Inforce Modeling Actuary at Fortitude Re and is responsible for leading the Traditional Life and Annuity Modeling team in BMA, CFT and LRT projections, reserve calculations and model development.

Valerie has 10 years of experience in US Life Insurance after transitioning from pension consulting. Prior to joining Fortitude Re, Valerie served as the Term and Traditional Life Model Steward and System Conversion Leader for Allstate Life and Retirement. She was accountable for model build, control and integrity as well as the implementation of conversions into valuation and modeling production processes. Previous to *this* role, Valerie worked on the FAS 97 close for Deferred and Equity Indexed Annuity products, developed new AXIS models for both Traditional and Universal Life products, and led the effort to design, implement and control the flow of AXIS model output.

Valerie earned a Bachelor of Business Administration in Actuarial Science and Risk Management and Insurance from the University of Wisconsin-Madison. She is a Fellow of the Society of Actuaries.

Agenda

SECTION 01	Introduction
SECTION 02	Effective cross-departmental collaboration
SECTION 03	Consideration of process and scale
SECTION 04	Focus on review and controls

SECTION 01

Introduction

Major Model Changes

Examples

1. Onboarding new blocks of business (acquisitions, reinsurance)
2. Regulatory enhancements
3. Expanding model calculation bases
4. Onboarding new or re-priced products
5. Modeling system conversion

Considerations

1. Regulatory requirements
2. Model risk
3. Internal and external auditor review
4. Change project management
5. Long term vision

SECTION 02

Effective cross-departmental collaboration

Business Requirements Document

Define model requirements *before* starting model build. Involve all model stakeholders including modeling team in gathering input and signing off. Uses include:

Model Methodology and Output

Ensure downstream users provide adequate detail for model methodology and report content and confirm that information requested will be used and is not redundant.

Informing SOW Agreement

Finalizing Business Requirement Document allows for more accurate SOW, specifically for cost estimates, if external help is needed and helps avoid misalignment on model needs.

Planning Timelines and Resourcing

First conclude on when post-change model results are needed. Determine if project can be completed internally or needs external assistance. Budget for internal or external resource time and cost.

Scoring of Final Model Build

Production model approval can include scoring against Business Requirements Document as part of User Acceptance Testing to confirm model is complete and fit for purpose.

Project Management

Ownership

- Modeling team or centralized PM function?
- Clear ownership of the following items is critical to success:
  - Active maintenance and review of question, task and finding logs
  - Ensuring tasks are completed to BRD standards
  - BRD modifications and downstream implications
  - Communication

Communication

- Project materiality informs communication cadence
  - Model stakeholders
  - Senior management
- Define critical metrics

Tools

- Traditional actuarial tools:
  - Excel templates
  - Meetings with status notes
- PM tools:
  - Jira
  - Wrike
  - Teams
  - Other?

Data Management

Data Questions

Consolidation and tracking of questions and timelines, particularly when dealing with external counterparty for data inputs to model build

Data Controls

Ownership of data controls, including ensuring consistency with internal standards

Data Approvals

Confirming proper documentation is provided and communicating with key parties to achieve sign-off within planned timelines

SECTION 03

Consideration of process and scale

Data Combination Strategy

Distinguish input and output tables by the following variables, as applicable

Valuation Date

Revisit which valuation dates to retain in Dev/Stage/Prod tables for input and output data if current build materially changes data volume or requirements

Iteration

Track multiple versions of input data if corrections are necessary

Model Version

Allows for new columnar format if model report format changes with version upgrade

Model Combination Strategy

Combine new models with existing models or keep separate? Combination pros/cons include:

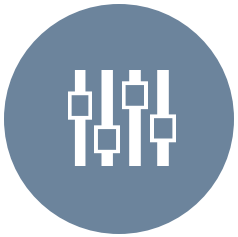
Pros	Cons
▪ Minimize redundant model updates	▪ Could limit accuracy depending on approach
▪ Ensure consistency of approach	▪ Limit to simultaneous model updates
▪ Allow for entity or company level modeling without need for separate consolidated model	▪ Coordination of model updates for uses with differing timelines

Prepare for success with **consistency**, regardless of current approach

- Identify model objects that need to align for model combination
- Develop standards for object characteristics (ie. order, naming convention)
- Ensure flexibility of naming convention to allow for growth

Speed/Granularity Tradeoff

Make informed decision based on model needs



Input Data

- Rightsize input data considering materiality of simplification

Model Code

- Is code beyond off-the-shelf model functionality necessary?
- Consider materiality of complex features and assumptions

Model Output

- Are standard reports sufficient per requirements?
- Are stakeholders considering data in standard reports before asking for customization?

SECTION 04

Focus on review and controls

Validation Approaches

Independent Tool	▪ Tools — Excel — Alternative actuarial software — Other? ▪ Consider ownership of build and maintenance
Parallel Testing	▪ Two periods preferred ▪ Determine appropriate comparison source and metric
User Acceptance/ Functional Testing	▪ Adjust level of detail for materiality ▪ Examples — Raw input data and data scripts — Product features (matching to policy forms or summarized product grid) — Assumptions (matching to consolidated documentation) — Sensitivities — Cash flow analysis
Regression/ Attribution	▪ Regression of existing calculation bases ▪ Attribution against original model — Adjust new model to align with old for quantification of known differences
Static/ Dynamic Validation	▪ Track nonmodeled components ▪ Compare cash flow projections against actual cash flows

Model Documentation and Approval

TOPICS

Include the following:

- Purpose
- Applicability
- Design
- Input data
- Assumptions
- Outputs
- Validation
- Simplifications and approximations
- Process documentation
- Reference documents

MAINTENANCE

Maintain on ongoing basis (consider noting necessary changes in change documentation)

APPROVALS

Consider appropriate *location* of documentation for approval

Consider appropriate *order* of stakeholder approval

- ERM
- Actuarial stakeholders
- Model Governance Committee

PRODUCTION

Ensure production results match development results

Thank you!

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