Cliver Wyman

ACTUARIAL Governance

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GONTENTS

01	Background
02	Data governance
03	Assumption governance
04	Model governance

D1 BACKGROUND

ACTUARIAL GOVERNANCE

A robust actuarial governance framework consists of multiple cross-functional frameworks that focus on governing data, assumptions, and models



Each sub-framework should define roles and responsibilities, provide clear policies and procedural guidelines, assess and control risks, and have a mechanism to address feedback

STANDARDS OF PRACTICE

Various ASOPs address key themes related to actuarial governance



- 2. Statements of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers
- 3. Pricing of Life Insurance and Annuity Products

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D2 DATA GOVERNANCE

The actuary should use available data that, in the actuary's professional judgment, allows the actuary to perform the desired analysis.



ASOP 23, section 3.1

COMPONENTS OF A DATA GOVERNANCE FRAMEWORK

Increasing demand for data is driving governance frameworks that focus on the effectiveness of managing, securing, storing, and using data



IMPLEMENTING A DATA GOVERNANCE FRAMEWORK



Identify

- Work with all actuarial stakeholders to gather all data files
- Structure data by process and by line of business
- Confirm data types and formats
- Identify and prioritize areas of improvement

IMPLEMENTING A DATA GOVERNANCE FRAMEWORK



standardize

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- Create a taxonomy of all data
- Classify at a high level the key future state data processes
- Design a master data warehouse
- Perform data standardization (format and type updates), if needed

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- Redesign
- Streamline and redesign the data process for the prioritized areas
- Update databases to fit to standardized data processes
- Identify data owners so access can be authorized and secure

IMPLEMENTING A DATA GOVERNANCE FRAMEWORK



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IMPLEMENTING A DATA GOVERNANCE FRAMEWORK



ASOP 23 requires all actuaries to perform a review of data, but with a strong data governance framework, this review would not have to take as much time



ASSUMPTION GOVERNANCE

For models that use assumptions as input, the actuary should use, or confirm use of, assumptions that are appropriate given the model's intended purpose.



ASOP 56, section 3.1.6

KEY ELEMENTS OF AN ASSUMPTION GOVERNANCE FRAMEWORK

Effective assumption governance spans multiple considerations and activities

1	Company-wide definition for "assumption"	 Distinguish between assumption and input to determine level of governance
2	Sensible review and approval structure	 Qualified oversight equipped to review with critical lens Explicit review and approval process with clear decision makers
3	Cyclical approach	 Assumption changes are driven and supported by data and analysis The impact of changes are clearly understood Monitoring is integrated into the process
4	Formal documentation and procedures	 Adhere to a formal framework for making proposed changes Robust documentation supports transparency and consistency
5	Comprehensive tracking and management	 Risk-focused use of an assumption inventory Transparent oversight based on risk and potential impact Promotes unification and coherence across enterprise

A framework should be optimized based on risk-mindfulness, rather than fulfilled for compliance only

DEFINING ASSUMPTIONS AND INPUTS

An **assumption** is any static, dynamic, or stochastic value and/or formula developed, in part or wholly, with reliance on expert judgment that affects projected results of actuarial models. An assumption is subject to a level of uncertainty; that is, its true value or form is not presently known.

An **input** is a value that is always both measurable and known (though it may change over time), and is therefore not subject to expert judgment. Not all inputs are assumptions, but assumptions are inputs to models. An example of an input that is not an assumption is product features.

"

Assumption changes go through assumption and model governance, while input updates only go through model governance

ASSUMPTION REVIEW AND APPROVAL STRUCTURE

Diverse practices have emerged in the industry to address the challenges of complexity, materiality, and scale



ASSUMPTION GOVERNANCE CYCLE

Detailed steps



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Detailed steps



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Detailed steps



ASSUMPTION GOVERNANCE CYCLE

Detailed steps



SAMPLE ANNUAL ASSUMPTION DEVELOPMENT TIMELINE



ASSUMPTION PROPOSAL PROCESS AND DOCUMENTATION REQUIREMENTS

Formal documentation and proposal process supports changes that are transparent, fully understood, and hold up to independent scrutiny

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- Providing a template ensures consistent and complete information
- Allow for exceptions that can result from use of actuarial judgment or special circumstances
- Documentation requirements should address all modeling uses relevant to your company
- Control activities (e.g. peer review) must be evidenced in a standardized manner

ASSUMPTION MANAGEMENT VIA A MASTER ASSUMPTION INVENTORY

Exhaustively tracking the assumptions via an efficient and practical tool supports meaningful governance

General purpose

- Purpose: inventory all assumptions used in production models, their risk classification, and review history and schedule
- Tracks important information for all assumptions:
 - Ownership
 - Financial segment and type
 - Model(s) impacted
 - Governance status
 - Data sources
 - Supporting documentation
 - Materiality

Design features

- Unique identifier to briefly reference assumptions and grouping by assumption type
- Identification of high priority assumptions based on their potential financial impact
- Capture of financial impacts by legal entity and accounting basis

Central inventory

 According to Oliver Wyman's recent assumption governance survey, nearly 70% of participants have an inventory of assumptions under governance, and nearly 20% have one in development

Quarter under review: 2019 Q1								
Assumption ID #	Name 🧊	Underlying Components	Description	Assumption Owner	Primary Segment	Secondary Segment	Assumption Type	Accounting Basis
85	Term: Mortality	-Base mortality -Mortality improvement (historical & future) -A/Es	The Term inforce model forecasts future anticipated death claims. The underlying mortality assumption is composed of base mortality tables, scalars ("A/E multiples"), and historical / future mortality improvement.	Life Assumption Owner	Life	Term	Mortality	GAAP

A master assumption inventory uses the potential impact and risk assessment of each assumption to determine the level of governance required

04

MODEL GOVERNANCE

The actuary should use ... reasonable governance and controls to mitigate model risk.



ASOP 56, section 3.6.4

MANAGING RISK

Three dimensions reduce the risk that models are misused or are not working as intended

Development and use



- Separate production and sandbox environments
- Change controls
- Input and output management
- Documentation



Validation

- An ongoing & independent verification activity
- Ensures that model calculations are performing as expected and used consistently with intended purpose

ASOP 56

Professional standards and guidance when "designing, developing, selecting, modifying, using, reviewing, or evaluating models."

Oversight



- Governance framework including roles, responsibilities, and standards
- Model inventory and risk assessment

DEVELOPMENT AND USE

Separate production and development environments plus analytic tools that do not affect results are important architecture components



CONTROLLED DEVELOPMENT CYCLE

Coordination with the Model Steward to execute a transparent and clear procedure is the key to success



ONGOING MODEL VALIDATION

Model validation is a recurring activity by an independent team

		INPUT VALIDATION	CALCULATION VALIDATION	OUTPUT VALIDATION
ple validation techniques	High risk models Medium risk models	 Full reconciliation against input source Assumption benchmarking 	 Independent full model replication (e.g. Testware) Independent sample recalculations 	 Static validation Dynamic validation Handoff testing Backtesting Implied rate checks Ledger reconciliation Trend analysis Sensitivity analysis Rollforward analysis
Sam	Low risk models	Spot checking	 Process approximation Formula inspection	Static validationDynamic validationImplied rate checks

Effective programs tailor validation techniques to model risk and materiality

OVERSIGHT

How are roles defined and who is responsible?

Roles



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Framework

- Who at the company is responsible for governance? Is the function centralized or decentralized?
- If a central vetting team is used, is it reasonable to expect the team to be experts across all lines of business and valuation bases? If not, then can they fully assess the "fit for purpose"?
- Is the same group responsible for implementation and execution of the policy?
- Should the model standards give guidance for other specific roles, e.g., model developers, model testers, model users?

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