

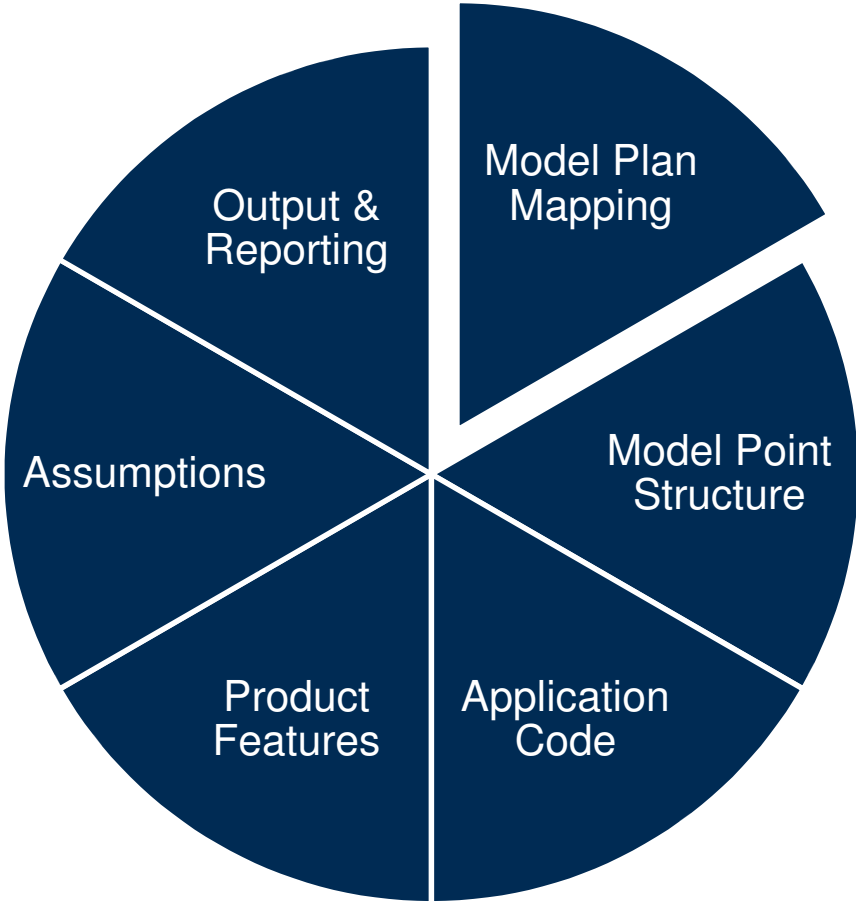


Scope of Model Validation

Iowa Actuary Club add date

Global Atlantic Financial Group (Global Atlantic) is the marketing name for Global Atlantic Financial Group Limited and its subsidiaries, including Forethought Life Insurance Company and Accordia Life and Annuity Company.

What are the 6 parts of MV Plan?



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What is Model Plan Mapping?

Model Plan Mapping is the process of assigning policy records to plans coded in the model.

EXAMPLE:

- In the model you coded up the largest Variable Annuity product with a GMWB rider with sales of over \$1 billion.
- There are a bunch of state variations of the same product.
 - One has different set of WB percentages. (sales of \$100M)
 - Another for some marketing requirements. (sales of \$50k)
- In the model, two state variations are mapped to large product
 - A slight difference, WB percent, small difference in results.
 - The marketing requirements have no effect.

Questions & Evidence (Q&E) Model Plan Mapping

Key Question

1. Are risk characteristics/product features preserved?

Evidence/Documentation/Suggestions

1. Plan Maps –organize in a spreadsheet
2. Suggest tracking size of mapped plans, may want to code separate when hit critical size.

What is Model Point Structure?

Model Point Structure is the framework, including the methods and tools, used to translate policy data into model records. The popular term is “compression”. Which is a way of grouping policies with similar characteristics.

EXAMPLES:

- For life insurance they may not code every single possible age. They may do quinquennial ages (every 5th age). Use average fund balance to combine similar sized policies.
- *Cluster modeling*, used in ALFA to combine like policies, to reduce the number of points ran through model. Instead of running 300,000 seriatim policies, may be only 3,000 clusters.

Q&E for Model Point Structure

Key Questions

1. How is each model point defined?
2. How are points grouped?

Evidence

1. Tools used for record generation.
2. Rationale for structure, document.

Application Code is the set of operations that define the model calculations.

But what is important to test with Application Code?

- If you are using a purchased projection system, you obviously need to be comfortable with how it performs calculations.
- The larger risk is the code that is modified or added to fit your needs.
- **Backend spreadsheets** should be included in the code review.
- Replicating the code is pretty key to confirming the code is working correctly.

Key Questions

1. Is model code black box, open code, made from scratch?
2. What simplifications/limitations are in the code?
3. Are there back end spreadsheets that are an extension of the model? Why?

Product Features are fixed characteristics of a product, including guarantees.

Review?

- Compare product coding versus the policy contract.
- Other sources: the administration system, pricing documents, and marketing materials.
- Each product feature must be reviewed.

Questions

1. Do policy contracts exist for modeled plans?
2. What features are not modeled? Why?

Evidence

1. Policy Contracts, Marketing Materials
2. Product documents – used for coding administration systems, supplied by Pricing.

Assumptions are model inputs estimated or projected based on experience, economic conditions or expert judgment.

Review?

- Evaluated for reasonableness.
- Reconciled with assumption documentation to ensure correctly coded into the model.
- Changes to assumptions generally should include “*sensitivity testing*” to quantify potential impacts of experience changes.
- Testing should include “*stress testing*”. This type of testing validates model stability. The stresses are far outside what would be expected.
 - Examples: dramatic rise/fall in interest rates, equity markets, and extreme mortality or lapse events.

Questions

1. Are assumptions supported by experience studies?
2. Was Expert Judgment used?
3. Are same assumptions used in all models? Why not?
(Pricing, Valuation, Hedging, other)

Evidence

1. Assumption inputs & Experience Studies
2. Results from different models implementing same assumption.

Output and Reporting includes the procedures used to translate, review, and prepare model output as useful business information.

- This includes using a database, excel or other software.
- In most cases this will concentrate on backend processes in Excel.

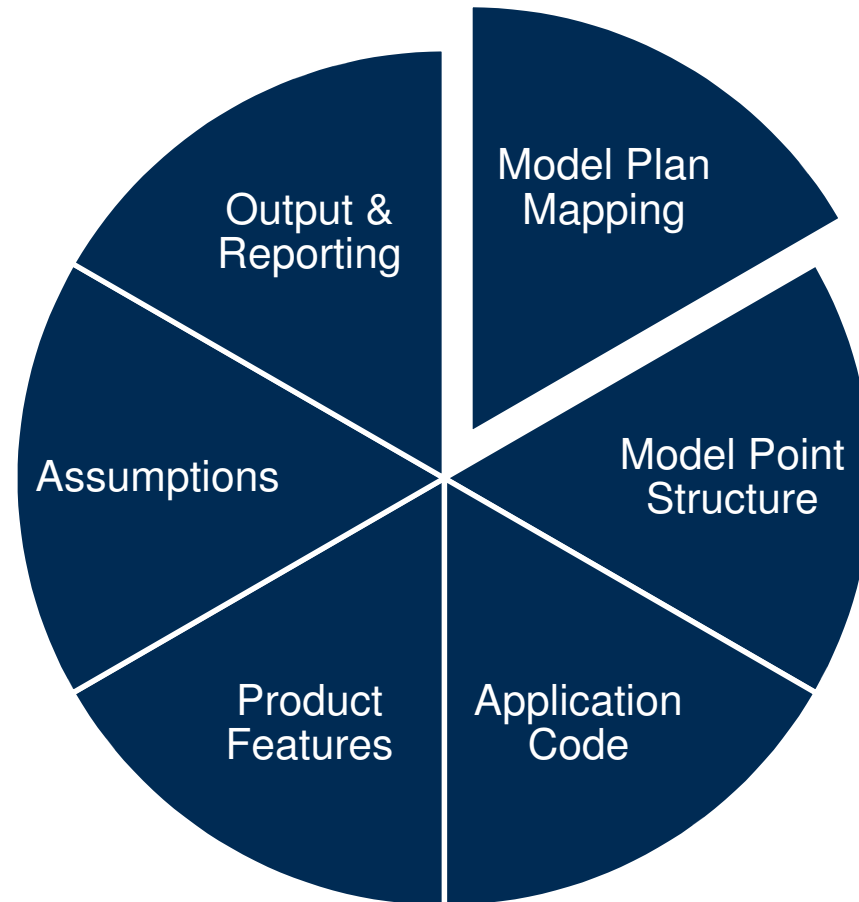
Questions

1. Format of model output? Can it feed ledger directly, or need back end spreadsheet?
2. Templates used to organize results?
3. Who receives model deliverable?

Evidence

1. SOX binder for Valuation models

What are the 6 parts of MV Plan?



Ready to start a Model Validation?

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