Session IV

Process Verification and Data Maintenance

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Model Validation *re* OCC Bulletin 2000-16

- Abstract computer models have three components.
  - Inputs
  - Processing
  - Output

Model Validation *re* OCC Bulletin 2000-16

- Abstract computer models have three components.
  - **Inputs**
  - **Processing**
  - Output

Model Validation *re* OCC Bulletin 2000-16

- Each of which is validated by respecting these general principles:
  - Independence
  - Documentation
  - Cost versus benefits

Inputs

- Output from other models
- Internal raw data
- External raw data
- Constructed variables

Model Outputs as Inputs

- Output from another internal model
  - Which itself is validated according to these principles
  - Ongoing forecast-versus-actual comparisons
- Output from vendor models
  - Ongoing forecast-versus-actual comparisons
    - Generic bureau scores applied to bank’s portfolio
  - Vendor documents its own validation process

Internal Data

- Reconciliation to general ledger or other MIS
  - Policy should specify error tolerances
  - Record of variances
  - Usually a strength of internal audit departments
- Test for accuracy of fields
  - Transaction testing

External Raw Data

- “Raw” observation from an external source (e.g., quarterly income growth)
  - Documentation:
    - User’s guide for accessing the data
    - Rationale for choice of source
    - Caveats as to accuracy
    - Any tweaks done to the variable

Constructed Variables

- Variables formed from raw data via simple definitions
  - Modelers should maintain data dictionary
    - Many possible definitions of “leverage”
  - Most external “raw” data is actually constructed data
    - Care should be taken to ensure that use of variable is consistent with definition

Processing

- Coding
- Theory

Coding

- Simple models
  - Independent and Identical Construction (IIC)
    - Cheap
    - Should produce identical results
- IIC not practicable for complex models
  - Too expensive
  - Would never get identical results, anyway
- For gray areas independent inspection of code can work
  - But far from fool-proof

Validating Code in Complex Models

- Inspection
  - Probably won’t work
  - Staff retention problematic

Validating Code in Complex Models

- Documentation
  - Internal code documentation
  - External technical documentation should cover interrelationships between modules, flow charts and “pseudo code”
    - Change control and documentation
  - Meet the test: Could an entirely new team use existing model to continue development or production?

Validating Code in Complex Models

- Comparison to other models
- Convergence to market
- Ongoing forecast-versus-actual comparison

Validating Theory

- Comparison to other models
- Convergence to market
- Ongoing forecast-versus-actual comparison

Validating Theory

- Documentation:
  - Reference to literature
  - Document internal applications and any innovations
  - Precise specification of question being answered

Conclusions

- Inputs and processing are the “perfectly” part of RAD’s mantra “all models should be perfectly wrong.”
- While the intellectual firepower goes to validating output, most of the expense goes to validating inputs and processing.

Comptroller of the Currency
Administrator of National Banks

Validation of Credit Rating and Scoring Models

15 minute Break

The Ambassador Ballroom