

Independent Model Validation & Model Governance

Current Challenge

Independent model validation is an integral component of model risk management in today's highly regulated financial environment. Poorly designed and functioning models can undermine otherwise solid financial reporting, lending, capital allocation and strategic decision making. Against this background, many financial institutions have been impacted by the supervisory guidance in Basel and Solvency II Regulations, as well as joint guidance produced by the Office of the Comptroller of the Currency ("OCC") and the Federal Reserve Board ("FRB"). Collectively, these regulations and guidance have significantly raised the bar for model validation and model risk management practices by taking a broader and more holistic view of models, the modeling process, and model governance practices.

However, financial institutions are often not able to internally support robust model validation efforts due to:

- » Concentration of modelling expertise residing in model design & development
- » Thinly staffed validation teams that are stretched across many complex models
- » Lack of widespread modeling expertise across the institution
- » Independence requirements between model developers and model validation personnel
- » Limited availability of data for in-depth validation exercises

Moody's Analytics Can Help

Moody's Analytics Model Validation and Model Governance Service offers to assess, design and implement model governance programs and conduct independent model validation. This service offers a combination of technical and advisory services that helps clients hosting their Internal Rating Models in RiskAnalyst™ or RiskOrigins™ as well as proprietary or third party platforms to align their approach to regulatory requirements under Basel, OCC, FRB, and Solvency II.

Moody's Analytics can assist validating a variety of models, including:

- » Internal Credit Risk Rating Models (i.e., PD, LGD, EAD)
- » Market Risk, Pricing and Valuation Models (e.g., Bonds, Derivatives, etc.)
- » Financial Reporting Models, Regulatory Capital and Economic Capital Models
- » Managerial Decision Making Models
- » Top-Down, Bottom-Up and Probability Transition Stress Testing Models
- » Liquidity Risk and Operational Risk Models
- » Catastrophic Risk and Insurance Risk Models (e.g., Underwriting, Reserving, Policy Behavior, etc.)

Moody's Analytics Model Validation & Model Governance Service will enable you to:

- » Evaluate conceptual soundness of your internally- or externally-built models, using your portfolio's data or external sample with similar characteristics
- » Assess performance of the model through leading industry practices leveraging statistical analysis
- » Validate all model assumptions, methodologies and associated parameters on a recurring basis
- » Conduct outcomes analysis to determine the accuracy of the model output based on model objectives
- » Verify that the model assesses material risks of the portfolio and ensures reasonable mitigation actions
- » Evaluate model interaction and integration within the enterprise-wide risk management system
- » Provide defensible documentation for third party review
- » Assess model compliance with FAS91, FAS133, IAS39 and other relevant accounting standards

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ILLUSTRATIVE EXAMPLE

Independent Model Validation and Model Governance Service	Quantitative Validation Report: A Snapshot														
<p>Moody's Analytics provides independent and objective, quantitative and qualitative model validation support, which incorporates leading industry practices to develop and maintain strong governance controls over a financial institution's risk management framework and model usage.</p>	DIMENSIONS	STATISTICAL TEST	ASSESSMENT	PROPOSED ACTIONS	MATERIALITY										
<p>This approach addresses multiple areas including: credit and liquidity strategy, governance, organization, people, process, technology and data management, as well as internal controls enabling senior management to effectively manage the associated business and regulatory requirements.</p>	Discriminatory Power	Accuracy Ratios ("AR") and Kolmogorov-Smirnov ("KS")	A	There is a downward trend observed from recent performance review, bank should review if any impact on application of score in various credit strategies (especially for unsecured loan product) and should consider finetuning scorecard for future enhancement ¹ .	High										
<p>As an example, for clients of RiskAnalyst and RiskOrigins software, this service validates the data quality, model design, risk components, controls, use test applications, and technology framework mapping information from model files to generate quantitative and qualitative validation reports.</p>	Model Stability	Population Stability Index ("PSI")	G	Nil	Low*										
<p>The reports display an assessment of model effectiveness and produce recommendations for model enhancements, the results of which have been validated by Moody's Analytics. Statistical tests and associated metrics are customized based on type of model, its application, and availability of data. Examples of metrics for validating credit risk models may include: Accuracy ratios ("AR"), Kolmogorov-Smirnoff ("K-S") Tests, Chi-Square Tests for goodness of fit, and Binomial Tests at selected confidence levels.</p>	Appropriateness of Risk Factors	Accuracy Ratio ("AR")	A	Keep on monitoring the discriminatory power for score factors.	Low*										
<p>Moody's Analytics also offers training workshops led by dedicated practitioners to help address validation findings and implement enhancements, when applicable.</p>	Appropriateness of Risk Factors	Pearson Correlation	G	Nil	Low*										
	Score Distribution	Frequency Plot	G	Recommend setting constraint on single score concentration in future model enhancement.	Low*										
	<i>* Industry Leading Practices at IRB initial Stage.</i>														
	DATASETS	SEGMENT GROUP	KS	AR											
	Development	Secured Loans Unsecured Loans Client ABS Overall	47.21% 61.62% 52.32%	58.95% 69.82% 63.45%											
	Validation	Secured Loans Unsecured Loans Client ABS Overall	43.26% 38.34% 40.35%	46.67% 35.45% 39.67%											
	QUARTERLY AR TREND ANALYSIS														
	<table border="1"> <thead> <tr> <th>Quarter</th> <th>AR (%)</th> </tr> </thead> <tbody> <tr> <td>Jul 12–Oct 12</td> <td>42.0%</td> </tr> <tr> <td>Nov 12–Jan 13</td> <td>48.0%</td> </tr> <tr> <td>Feb 13–Apr 13</td> <td>28.0%</td> </tr> <tr> <td>May 13–Jul 13</td> <td>19.0%</td> </tr> </tbody> </table>					Quarter	AR (%)	Jul 12–Oct 12	42.0%	Nov 12–Jan 13	48.0%	Feb 13–Apr 13	28.0%	May 13–Jul 13	19.0%
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