

# MODEL VALIDATION SERVICES



## KEY FEATURES

- Robust methodology that takes a holistic view of the model rather than purely quantitative validation.
- Methodology for validation of PD, LGD and EAD models
- Mechanism whereby the business can reaffirm that models being used for very important credit decisions are working well.
- Meets the requirements from a Basel II perspective.
- Strong team - combination of qualitative and quantitative experience.
- Supported by a team of advisors comprising of people from academia, researchers and industry experts.
- Demonstrated thought leadership in the area of risk management and Basel II.

*Oracle Financial Services Consulting (OFSC) offers Model Validation services to partner with banks in conducting end-to-end review of their analytical models. These services are targeted not only at meeting regulatory requirements, but helping banks align the performance of their models with business expectations and industry best-practices. This is achieved through our Model Validation methodology that is based on expertise gained by executing a wide range of assignments with leading banks. This holistic methodology covers not only model analytics, but also the related processes, procedures, systems, controls and the attendant data infrastructure. This approach helps in viewing models not as isolated mathematical entities but as key credit decision enablers.*

## Key Imperatives for Model Validation

Model Validation is a vital component of the “**Modeling Lifecycle**” comprising Model Building, Model Monitoring and Maintenance, Model Validation and Model Recalibration.

Predictive analytics based models are increasingly being used in most banks across the globe in areas like loan approvals, limit management, loss reserve computation, economic capital computation and allocation among others. While this has had significant benign effects in terms of increased objectivity and reducing the decision making time, it also embodied significant “Model Risk”.

*The process of Model Building is not a one-time activity. Every model is limited by assumptions on the underlying population and the quality and data availability. Therefore, unless a model is constantly monitored, maintained and upgraded, its discriminatory power and calibration accuracy would suffer over a period of time. In such a scenario, banks would have to spend significant time, effort and cost in re-building the models. In addition it would also increase the change of banks making wrong decisions based on “Out Dated Models”.*

The (mis)use of models has been cited as a key reason behind the rampant growth of residential mortgages including Subprime credit and the resulting crisis that has bogged the financial world. Supervisors are increasingly stressing the need for having a hard look at the models to ensure that these are robust and aligned with industry best practices. Supervisors have gone to the extent of issuing cease and desist orders to prevent banks from growing their assets further until models have been validated.

## Model Validation Methodology

Our Model Validation Methodology is suited to addressing the holistic nature of model validation requirements that encompasses not only quantitative validation but also the complete systems, processes, documentation, controls and data surrounding the models.

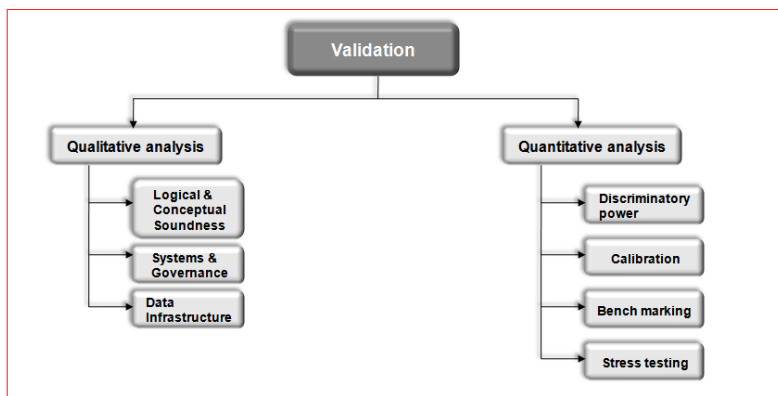
**HOLISTIC APPROACH**

QUALITATIVE VALIDATION

- Logical and Conceptual
- Systems and Governance
- Data Infrastructure
- Systems

QUANTITATIVE VALIDATION

- Discrimination Power
- Calibration
- Back-testing
- Stress testing



*The validation process encompasses both qualitative and quantitative aspects and is applied to the entire modeling universe*

**Validation of Logical and Conceptual Soundness**

The validation process for logical and conceptual soundness of the model assesses the economic plausibility of the model and compares the model to other models being used in the industry. This also takes into account how the models will be used by the bank and how it fits into its business strategy. The key aspects of the validation would encompass:

- *Economic plausibility of the model*
- *Empirical evidence supporting the choice of model*
- *Data analysis at individual factor level (Univariate) and using combination of a set of factors (Multivariate) to validate the model*
- *Model type:, does it reflect the industry trend for similar type of products*

**Validation of Systems and Governance**

The validation process for systems and governance assesses the systems and control environment under which IRB Rating Systems operate. The importance of this step in the process of validation is to ensure that there is adequate accountability and governance structure surrounding the operation of the rating system. The key components of validation of systems and controls are shown below:



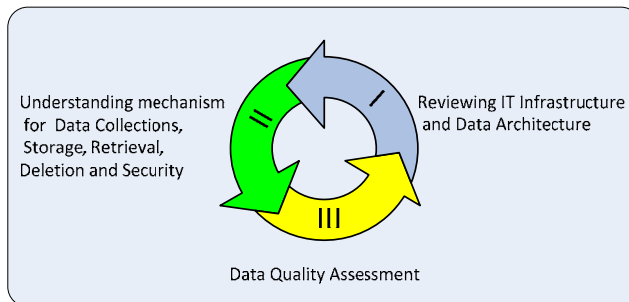
- Level of corporate governance and oversight:** *The validation process would look at the level of board and top management oversight in the process of choice of models and estimation of model parameters*
- Clear definition of roles and responsibilities and accountability:** *The validation process would assess if the parties responsible for model building are clearly identified and if their performance is measured against the performance of models against the set criteria*
- Transparency in Documentation:** *The validation process would look at the quality of documentation of the model design and operations*
- Independence:** *The validation process would look at the level of independence*

*in model building and review of models*

- e. **Use Test:** *The validation process would also ascertain if models are being used in the day-to-day operations of the bank and do not exist in isolation*

### Validation of Data Infrastructure for Modeling

The validation process for data infrastructure assesses whether the systems are able to produce accurate and reliable information that can be used for producing the risk parameter estimates. The key components of validation are illustrated in the following diagram:



- a. **IT infrastructure and data architecture:** *This would involve assessing the adequacy of IT infrastructure, Data Warehouses or Datamarts to manage data required for model building, model usage and model validation*
- b. **Mechanism for data collections, storage, retrieval and deletion:** *Assess if there are clear, documented standards and guidelines for collection, storage and maintenance of data such that availability of quality data is ensured for model building and validation*
- c. **Data quality assessment:** *Assessing the data quality control measures including data validation and error detection, data cleansing, reconciliation, missing value handling and exceptions reporting*

### Quantitative Model Validation Methodology

Quantitative Validation would encompass the validation of the discriminatory power of the models and their calibration using statistical methods. It would also include techniques like Stability Analysis, Benchmarking Analysis and Back-testing to compare the model output to actual results.

**KEY BENEFITS**

- Ability to understand performance of key models
- Compliance with supervisory needs
- Gives early warning on “Model Obsolescence”
- Gain the ability to benchmark models with industry best practices
- Review attendant process, policies, control systems and data infrastructure surrounding the model

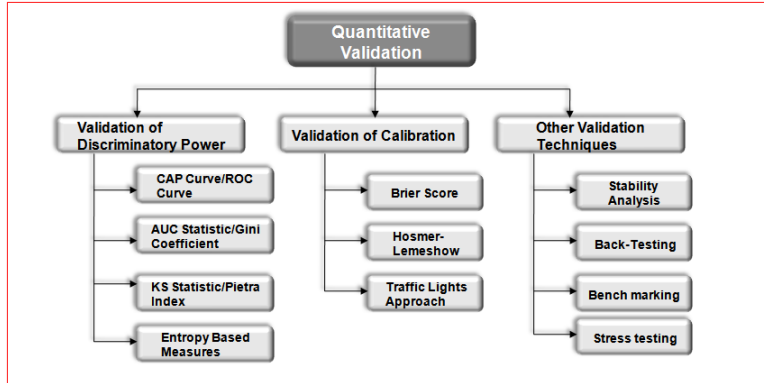
**RELATED OFFERINGS**

The following offerings are also available from Oracle Financial Services Consulting:

- Data Gap Analysis
- Functional Gap analysis

**RELATED PRODUCTS:**

- Oracle Reveleus
- Oracle Crystal Ball
- Oracle Hyperion



**Oracle Financial Services Value Proposition**

Oracle Financial Services has adopted an integrated “Practitioners” approach to business and technology issues based on its deep domain expertise and rich experience in delivering technology solution. Given that Model Validation would have an organization wide impact encompassing policies, processes, systems, data and analytics this would be a compelling value proposition. Our methodology is based on expertise gained by executing a wide range of assignments with leading banks, across the globe, and is primed towards assisting banks throughout the Modeling Lifecycle. Some of the salient value propositions are given below:

- Robust methodology that takes a holistic view of the model rather than purely quantitative validation.
- Methodology for validation of PD, LGD and EAD models
- Mechanism whereby the business can reaffirm that models being used for very important credit decisions are working well.
- Meets the requirements from a Basel II perspective.
- Strong team - combination of qualitative and quantitative experience.
- Supported by a team of advisors comprising of people from academia, researchers and industry experts.
- Demonstrated thought leadership in the area of risk management and Basel II.

**Contact Us**

For more information about Oracle Consulting’s Model Validation Services, please visit [www.oracle.com/financialservices](http://www.oracle.com/financialservices) or email us on [financialservices\\_ww@oracle.com](mailto:financialservices_ww@oracle.com)



Oracle is committed to developing practices and products that help protect the environment

Copyright © 2009, Oracle and/or its affiliates. All rights reserved.

This document is provided for information purposes only and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. 0409