

Model risk control framework Implementation experiences

Presentation to ASSA



August 2014

Introduction

Purpose and Context

Purpose of this presentation is to share some implementation lessons learnt I have had over the last year in implementing a model risk control framework for Barclays Africa Group.

I will share some facts and aspects of the Barclays framework and regulatory guidance, but mostly I will share my thoughts on the challenges and process of such an implementation. Therefore what is contained in these slides are my personal opinion and should not be interpreted as an official position of Barclays Africa or Barclays.

If you want to move mountains tomorrow, start lifting stones today
African Proverb

Introduction

Some commentary on models and model risk

Models are not right or wrong. They are all wrong.

So the question you should ask is does the model tell you more than you would know otherwise?

What happens if you kick the system?

We live in a complex dynamic industry/ company. How can we approach this?

If you want to control model risk , define control over the model lifecycle.

Guidance documents

Supervisory guidance on model risk management - OCC 2011 -12

The evolution of model risk management – PwC May 2013

So where do we start?

Model Risk Control Framework

Begin with the end in mind

Have a clear definition of model risk

Definition of Model Risk (Barclays Africa Group)

Potential for adverse consequences from decisions based on incorrect or misused model outputs and reports. Model risk can lead to financial loss, poor business and strategic decision making, or damage the group's reputation.

Definition of a Model

It is any non-trivial quantitative method that applies to methodologies or assumptions using data to generate a material quantitative output, when used for:

- measuring BAG risk (Credit, Market, Funding, Insurance Risk)
- measuring regulatory and economic capital adequacy (Stress testing included)
- external reporting requirements (Impairments, Valuations, Accounting, Tax)
- business decisions (Decision scorecards, Pricing models, Fraud, Collection)

Contain scope by defining what is not a model

- Tools that apply rules imposed by external parties
- Simple aggregation of data or outputs from other tools or models
- Simple forecasting methods such as trend lines
- End-user tools used to inform decision in a non-automated form

BAG Model Risk Control Framework

Model definition - points for consideration

Who adjudicates what is considered a model?

What do we do with “models” that don’t meet this definition?

How are we keeping track of models?

What do we want to use our inventory for?

How do we roll this out or bring models into governance?

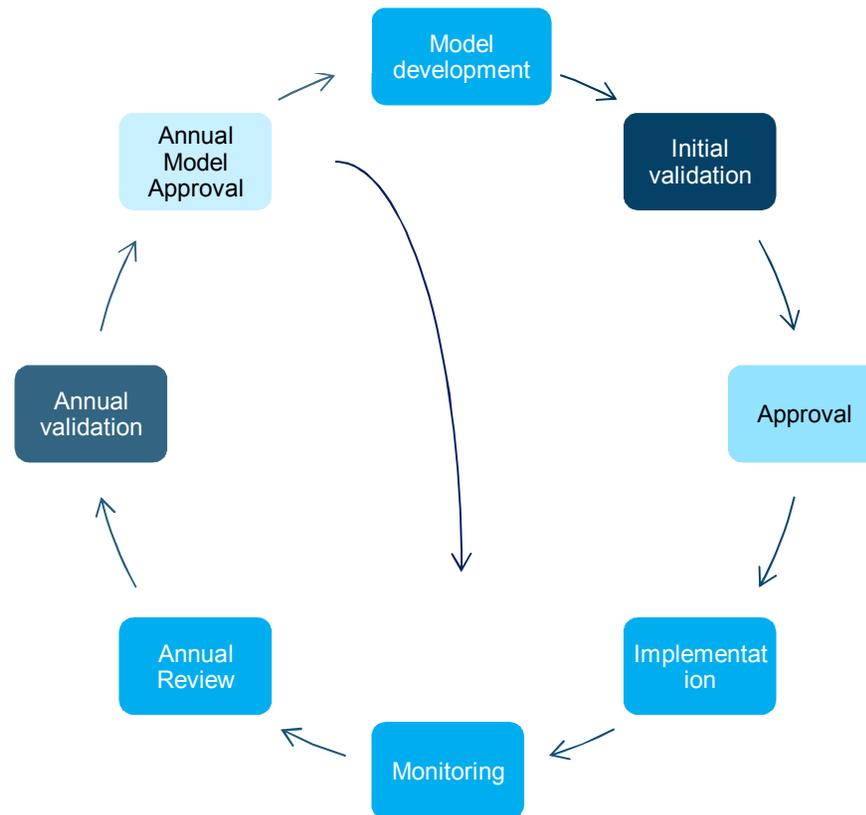
Who is responsible for all the implementation?

BAG Model Risk Control Framework

Model lifecycle

Roles and responsibilities

Business represented by the Model Owner takes responsibility for model development, implementation, monitoring and the Model Risk function will take responsibility for model policy and control and independent validation. Models are approved by the CRO supported by the technical committee.



Model Risk Drivers

Used to assess models across the model life-cycle

Model Risk Drivers
Data and Input Processing
Design and Conceptual Soundness
Implementation and System Control
Internal and external requirements
Model Performance and Use

Model monitoring

Standards example - Credit

Models in use are required to be monitored regularly.

Monitoring frequency considers the model materiality and nature (e.g. low data/default, model simplicity). For material and regulatory models with sufficient default data, quarterly monitoring is required.

- Key performance metrics are updated along with historical trends on a quarterly basis
- Thresholds for monitoring specific aspects are set based on the development sample in line with the standards
- The monitoring cycle begins where the development sample ends.

Monitoring assessment will focus on specifically on the following model risk drivers:

- **Model Use and Performance:** Assessment of whether the intended use is in line with the model design and whether the performance is within the expected ranges continuously.
- **Model Governance:** Assessment of all other elements of model risk covering both internal and external/regulatory requirements.

Remedial actions are assigned and tracked.

Annual Review Standards – Credit example

The annual review presents is presented by the **Model Owner** and includes his support and analysis **supporting further use** of the model. The following analysis should be performed as part of the annual review:

- **Model performance trends:** The annual review should have a more in depth analysis and commentary driving from the monitoring performed:
- **Model risk assessment refresh and data updates**
- **Business or regulatory implications:** Assess whether changes in product, policy, strategies, target market, regulatory and internal environment, usage or other changes cause deterioration in the performance of the model;
- **Compliance Testing:** Compliance testing or gap analysis against the Models Risk Policy requirements should be included as part of the Annual Review document;
- The model results could be benchmarked against similar external or internal portfolios

Initial and annual independent validation Standards

Definition of Terms

Conceptual validation – During conceptual validation the model development document and data is reviewed and an opinion is formed about the conceptual soundness of the model built by the model development team. This includes the process followed by model development in selecting factors or approaches during the modelling process. Reliance is placed on model documentation and tests performed by the model development or model monitoring team (implemented models). Re-performance is not included.

Applied validation – During applied validation, the model is implemented independently and all the steps are re-performed. This applies to the data extraction process, data quality checks, model building steps and the tests performed to assess model performance. A documented set of tests are performed. Additional tests deemed appropriate may also be performed by the validation unit.

Challenger models – as part of the validation, the validation team builds challenger models to challenge either the whole model or specific aspects of the model such as segmentation etc. It could also entail the use of a benchmark model.

To illustrate how this would apply to the validation process, tables are presented of the use of the different validation components across models for impairment and capital models.

Initial and annual independent validation Standards

Validation scope

The scope of a validation covers the following model risk factors:

- Data and Input Processing
- Design and Conceptual Soundness
- Implementation and System Control
- Internal and External Requirements
- Model Performance and Use

Each factor is assessed and assigned a Red/Amber/Green rating. Based on the outcome of the assessment of the individual model risk factors the model is also assigned an overall Red/Amber/Green rating.

The scope of the validation and the tests performed for each model risk factor is determined by:

- Type of model (regulatory, impairment, decisioning)
- Model materiality
- Initial or annual validation

Initial and Annual Independent Validation Standards

The table below provides an indication of the proposed scope / depth of validation given model materiality.

Validation type / activity	Materiality		
	High ¹	Medium (All medium and low Regulatory Capital, all new medium and low Impairment)	Low
Challenger validation	Apply alternative component /model / methodology	Not required	Not required
Applied validation	Where appropriate, apply benchmark model Re-run / replicate developed model Apply documented set of validation tests		Not required
Conceptual validation	Conceptual review of all aspects of the models Validation Red/ Amber/Green criteria / check-list and conceptual review		

Initial and Annual Independent Validation Standards

Model Risk Factor	Test Components
Data and Input Processing	Documentation of the data extraction process Data quality Was sampling used and did it follow a robust process? Is the data secure and where is it stored?
Design and Conceptual Soundness	Appropriateness of methodology Was alternatives considered or should challenger models be developed? Robust factor selections? Appropriate granularity and complexity Limitations of the methodology Was expert input used and how is it managed and applied?
Implementation and System Control	Model implementation feasibility and timelines Specification, prototype and IT development for new models Post implementation review and testing
Internal and external requirements	Model governance and compliance with Group frameworks, policies and standards Regulatory compliance requirements
Model Performance and Use	Model use and purpose Model override and post model adjustment Model utilisation / coverage Accuracy / calibration, Discriminatory power / rank ordering Stability

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Ina an experienced financial services risk management executive. She has 23 years of financial services experience of which approximately 10 years were spent with the Treasury trading, structuring and market risk management functions in the banking industry.

Thereafter she joined the consulting industry where she consulted on risk and treasury management to blue chip financial and non-financial services companies, across Africa and the Middle East.

Before joining Barclays Africa Group she was a partner at PricewaterhouseCoopers in South Africa where she was responsible for the Financial Risk practice.

In her new role she is the Head of Model Risk where she is responsible for the model risk control framework across Africa. She has specific expertise in market and credit risk modelling, derivative valuations and model validation.

She holds an MSc in Applied mathematics from the University of Pretoria and a Certificate in Treasury Management from Unisa.

Her hobbies include breeding indigenous plants, wild life and horses. She is a mother of four and wife to Chris. She is passionate about the development of talent in the work place and exploring the opportunities in Africa.