The Importance of AML Model Governance and Validation

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Introduction

With the technological advancement, the high complexity of the banking industry and the broader application of modeling, financial institutions (FIs) around the world are relying heavily on quantitative analysis models to make predictions within the risk tolerance. These include models on analysis from underwriting credits to the anti-money laundering (AML) program.

Due to the increasing numbers of risk models being used by FIs, regulators have correspondingly increased focus on the tighter requirement of robust AML models, including model validation and quantitative analysis. As a result, regulators have shifted their focus to model examinations. For example, the OCC\(^1\) has employed more staff at their Risk Analysis Division on model testing.

Moreover, with the adversity of recent regulatory breaches, regulators have a high expectation that all FIs should develop complex AML programs with sound measures to effectively manage model risk. As a result, multiple regulatory guidance has been issued which has affected the FI’s overall administration on the AML program.

As an auditor, it is now paramount to be able to perform audit and validation on the AML risk model. For example, as part of the regulatory guidance issued in 2011 jointly by the OCC and the Federal Reserve, the Supervisory Guidance on Model Risk Management (OCC2011-12)\(^2\) requires independent audit to ascertain that the AML model is validated, meaning it is functioning effectively and efficiently as designed. Thus, auditors should be familiar with the components of the models, its requirements and steps to validate the model.

As such, the auditor should have the expertise to address or ascertain the following to validate the model:

- Clearly documented approach and consistent methodology to model risk management;
- Model risk management should be aligned with the enterprise-wide model risk management policies or practices;
- The documented approach required to validate the AML models;
- Ascertain that the alert/filtering level quality is configured appropriately; and

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1 Office of the Comptroller of the Currency (OCC)

2 The supervisory guidance on model risk management, issued in April 2011, was developed jointly by the Office of the Comptroller of the Currency and the Board of Governors of the Federal Reserve System.
• Whether default parameter values in the AML models configured by the vendor are appropriate or require additional tuning.

This white paper will discuss the rationale on the requirement of a sound model risk management, the key components/requirements of a risk model, as well as key items to watch for during model validation.

**Regulatory Requirement**

For the last few years, as a result of the large number of regulatory breaches from the failure caused by ineffective AML programs that lead to fine and penalties, there has been increasing regulatory requirements put forth for FIs, to ensure that AML model risks are at an acceptable risk level, including regulatory guidance that has a direct impact on the FI’s overall administration on the AML program.

For example, in April 2011, the OCC had issued supervisory guidance on ‘Model risk management,’ which requires FIs to conform to the principles on risk model development, implementation, use and validation. Since then, regulatory agencies have shifted their resources and focus to assessing how institutions model their transaction monitoring programs. These regulatory agencies now perform examinations that go beyond a regular audit that requires specific evaluation on the risk model, and are instead seeking to assess effective management of risks that arise when using quantitative models in decision-making.

Noncompliance of the guidance may lead to fines, penalties and/or enforcement actions. For example, in 2012, the OCC issued a Consent Order to Citibank for its deficiencies in the FI’s BSA/AML compliance program, in particular weaknesses in the AML model risk management.

Furthermore, in December 2015, NYDFS announced a proposed new AML regulation (Section 504), that requires FIs that are chartered or licensed under the New York Banking Law to have more responsibilities, including a robust transaction monitoring (TM) system, a watch-list filtering program, and that the chief compliance officer certify that the FI has sufficient programs in place to comply with the regulation, on an annual basis.

The NYDFS’ proposed regulation (Section 504), currently seeking comments from the general public until March 31, 2016, is resulted from a series of investigations conducted by the NYDFS over the last few years. The investigation discovered numerous deficiencies on the breach of

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3 The guidelines were adopted by the OCC as Bulletin 2011-12 and by the Federal Reserve as FRB SR 11-7. The new OCC bulletin supersedes OCC Circular 2000-16, which focused primarily on an independent and comprehensive model-validation function.

4 In Apr 2012, Citibank, N.A., has entered into a Consent Order with OCC regarding certain deficiencies relating to its Bank Secrecy Act/Anti-Money Laundering

5 the New York State Department of Financial Services

AML and sanctions compliance, in particular on transaction monitoring and filtering, and a lack of accountability at the senior levels. As a result, a regulation is needed to address these issues.

Under the NYDFS proposed regulation (Section 504), every FI regulated under NYDFS must maintain a robust transaction monitoring system to monitor transactions on AML violations and suspicious activities. If the proposed regulation goes through, other regulators will most likely follow.

The proposed regulation (Section 504) has various requirements, including the control of risk model on transaction monitoring program. Some of the key attributes required under the proposed regulation are:7

- The program must be based on the risk assessment of the FI, and matched to the FI’s business, products, services and customers;
- The system settings and detection scenarios must be designed to reflect the FI’s AML risk assessment, CDD information and other information from areas such as security, investigations and fraud prevention;
- There are documentation describing the FI’s current detection scenarios with its associated assumptions, rule setting and parameters;
- Ongoing analysis of the continued relevancy of parameters, thresholds and other settings; and
- FIs are prohibited from changing or altering the AML model to lower the alerts to avoid filing SARs.

Most importantly, the chief compliance officer, under the proposed regulation, is required to certify that the TM program meets all regulatory requirements on an annual basis, which is a regulatory requirement that is even more stringent than the AML regulations currently prescribed by the U.S. federal government. This places a lot of burden on the compliance officers, as any noncompliance of the proposed regulation may subject them to criminal penalties.

In view of these heightened regulatory requirements, FIs are scrambling to review their AML models (such as transaction monitoring, sanctions filtering) to ensure they are in compliance. FIs also need to ensure the AML models cover accurate and relevant risk exposures matching the FI’s risk profile and appetite.

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Overview

As the FI industry becomes more and more complex, coupled with the advanced technological breakthroughs, FIs around the world are increasingly relying more on mathematical models to make business decisions, as well as to meet regulatory requirements.

Nevertheless, the risk inherent in these models, or so called ‘model risk,’ has drawn concerns among regulators. In particular, due to the recent regulatory breaches as a result of the AML model failure, these models are under scrutiny by the regulators, including automated and manual processes of transaction monitoring systems, customer risk rating systems and watch list filtering systems. As a result, regulatory guidelines, such as the Supervisory Guidance on Model Risk Management, were issued on model risk governance, including the AML model.

What defines a model?

Although different FIs define models differently, the OCC 2011-12 Guideline has the following definition for a model:

“A quantitative method, system, or approach that applies statistical, economic, financial, or mathematical theories, techniques and assumptions to process input data into quantitative estimates.”

Simply put, a plain transaction monitoring product, in its most basic form, is not a model. However, if the TM is tailored with optimization and rigorous segmentation delineations, and quantitative elements are added, it becomes a model.

For example, the following are all models relating to AML:

- Transaction monitoring model
- Customer risk rating model
- Suspicious activity alert model
- Sanctions filtering model

In short, models are simplified representations of real-world relationships with an attempt to transform such cases into mathematical equations using various assumptions and generate comprehensible information/data.

In addition to the OCC 2011-12, the NYDFS has proposed a new AML/CTF regulation that requires a risk model, in particular a Transaction Monitoring Program, that:

(1) The risk model must be based on the risk assessment of the institution;

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8 OCC 2011-12 section III: overview of model risk management, page 3
9 NYDFS propose a new regulation to ensure an AML program, which is a risk model, to be properly maintained and be certified by the chief compliance officer. GOVERNOR CUOMO ANNOUNCES ANTI-TERRORISM REGULATION REQUIRING SENIOR FINANCIAL EXECUTIVES TO CERTIFY EFFECTIVENESS OF ANTI-MONEY LAUNDERING SYSTEMS. NYDFS [http://www.dfs.ny.gov/about/press/pr1512011.htm](http://www.dfs.ny.gov/about/press/pr1512011.htm)
(2) The risk model must include all relevant laws and regulations related to AML/CTF, and other relevant factors, such as KYC/CDD, or fraud, etc;
(3) Link to the bank’s AML risks on various functions, including businesses, products, services and clients; and
(4) Based on the scenarios as defined in the risk assessment model, the program should be able to detect most (if not all) potential money laundering/suspicious activities.

Model risk

The OCC 201-12 model guidance also indicates that there are various risks associated with modeling, and many of those risks are applicable to the AML TM program.

As quoted from the OCC 2011-12 guidance “scope of model risk management encompasses model development, implementation, and use, as well as governance and controls related to models.” Model risk could be interpreted as undesirable outputs derived from inaccurate/inappropriate models, and could incur at every instance during the lifecycle of the model.

The following are examples of AML model risks:

* Data: Incomplete/inaccurate customer or transactional data, errors during file loading stage or timing difference, incompatible data during mergers/acquisitions, and design without consideration of a full set of data.

* Design: Model was designed without taken all regulatory requirements into consideration, and fundamental logic was inaccurately designed and is not able to meet regulatory requirements.

* Resources: The lines of authority and accountability are unclear which leads to no one taking responsibility and unplanned resources resulted from the lack of knowledgeable/experienced staff to effectively manage the model.

* Security: Insecure model logic and parameters leads to alternation of model with potential fraud, and the objective of suspicious transaction filtering could be compromised.

To better understanding and mitigate the model risk, we need to understand the components of an AML/BSA model, which is comprised of three components as mandated by the OCC 2011-12:

1. Model governance
2. Model development, implementation and use
3. Model validation

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Model Governance

A good and effective model governance should go beyond merely setting up a governance committee with reporting structure. The model governance structure should include well defined policies along with procedures on monitoring and reporting of risks at the functional level. In addition, the governance structure should be able to monitor and respond to adverse events and risks both internally and externally.11 As stipulated in OCC 2011-12, the following are key requirements of good model governance:

**Board and senior management:** The guidance places great emphasis on the role of the board of directors and senior management in evaluating the effectiveness of a comprehensive framework for managing model risk, which is to take the responsibilities of ensuring a bank-wide approach to manage the model risk, and maintaining an effective model risk management framework. Each model must have a purpose. Management must ensure that the model be aligned with the business objectives and regulatory requirements.

**Project management:** A formal project management structure is established to ensure the project is efficient and effective (meet both business objectives and regulatory requirements).

**External resource:** If the model is to be supplied by the external vendor, the Guidance requires that, “FIs should require the vendor to provide developmental evidence explaining the product components, design, and intended use, to determine whether the model is appropriate for the FI’s products, exposures, and risks.” The FI should also have documented agreed-upon scope of work, and ensure that staff is assigned to understand the work performed by the external vendor for knowledge transfer purposes.

**Enabling technology:** One of the key challenges in maintaining an effective AML compliance program remains the effective use of enabling technology. Therefore, it is critical to ensure that the technology and system matches the scope and objective of the risk model and effectively provides the solution to effectively screen out the suspicious transactions, for example. The system should also be reviewed on a periodic basis, so that new technology can be integrated into the risk model framework to perform more efficiently.

**Policies and procedures:** To ensure a set of effective policies and procedures are taken place, a process must be in place to formalize the policies and procedures on the model risk management, and such policies and procedures should be commensurate with the FI’s structure, business activities and products. These policies and procedures must also be approved by the board. To ensure they are up-to-date, the policies and procedures must be reviewed at least on an annual basis. In addition, the roles and responsibilities should be

clarified defined among business units and control functions, with details on staff expertise and authority. For external vendor involvement, the policies should document how the external vendor’s work should be integrated with the risk model, such as the scope of validation.\textsuperscript{12}

**Independent audit and testing:** As part of the model governance, there is a requirement for an independent audit to ascertain if the model is functioning as effectively and efficiently as designed. Therefore, if the internal auditor is to perform the independent audit, the auditors must not be involved in any of the risk model framework’s development and use. However, internal auditors should assess overall whether the model risk framework is effective and comprehensive. Therefore, auditors should be familiar with the components of the models, the requirements and steps to validate the model.\textsuperscript{13}

**Documentation:** A clear understanding and documentation of expected performance is necessary and the fundamental basis on which all validation approaches must be built. The accountability and responsibility should be clearly defined, including roles and responsibilities for the model owner, user, administrator, validator, tuner, as well as the governance committee. Moreover, comprehensive and consistent documentation needs to be maintained to ensure that complete documental evidence exists for every component and phase within the process.

**Model inventory:** FIs should ensure that a comprehensive set of information on the models (have either been implemented, are still in progress or have already been retired) be maintained, preferably by a central team with a centralized repository for all regions. Some of the key items that should be documented on the inventory include:\textsuperscript{14}

- The purpose of the model, along with how it is to be designed, the actual vs expected usage, as well as restrictions on use if any;
- The type and sources of inputs and its underlying components, as well as model outputs and its intended use; and
- Indication on whether the model is functioning as it should be, a log with a description on when it was last updated, and policy expectations, if any.

Once the information has been maintained, a ranking process should be used to assign various level of risks, and the controls associated in accordance to its risk level.

**Model Development, Implementation and Use**

\textsuperscript{12} OCC 2011-12 IV: Governance, policies and Controls – policies and procedures (page 17) stipulates the policies and procedures required for the risk models


\textsuperscript{14} OCC 2011-12 section VI: governance, policies, and controls, - model inventory, page 20 – clarifies the items that should be on the model inventory
As the risk model framework is very complex whilst taking multiple factors into considerations, it is critical that knowledgeable and experienced people are involved in the model development, implementation and usage stage. As each FI would have different corporate structures, scopes and objectives, the risk model should be tailored to each FI’s specific needs. Thus, engaging knowledgeable and experienced system developers is paramount to its success.\textsuperscript{15}

Development

Critical inputs are largely dependent on the input provided by the stakeholders, such as business units, on how they are intended to be used and compliance on the regulatory requirements and red flags to be filtered out. Therefore, it is important to have a clear statement of purpose so that the development would be in line with the FI’s objective. The following are key components at the development stage:\textsuperscript{16}

- Model definition and requirements must be clearly defined with detailed requirements and objectives properly documented, as the risk model would be developed based on the defined requirements.
- The design of the risk model must be based on the business’s objectives and requirements, whilst taking the regulatory requirements into consideration.

Implementation

Once the AML model has been developed, the model should be tuned to optimize the process. The optimization process will usually involve the following key areas:\textsuperscript{17}

- Gap analysis – Condauct an assessment to identify the areas within the model that have not met the requirements and proceed to close those gaps;
- Prescriptive methodology – Define a methodology that will optimize the model based on quantitative analysis, and tune the model on an ongoing basis;
- Documentary evidence – Throughout the life cycle, ensure the process is thoroughly documented, including approvals and justification for enhancements.

One thing to note is that FIs might lack the expertise in the area of AML system design to develop scenarios effectively and, therefore, are unable to filter out the red flags. In other cases, FIs would rely solely on the vendors to implement the AML system without acquiring such knowledge in house.

Use of the Model

\textsuperscript{15} OCC 2011-12 section IV: Model development, implementation, usage (page 5) describe the importance of Model risk management via development, implementation and usage.


\textsuperscript{17} Model Risk Management, Crowe Horwath, May 2013 page 27, under the model tuning and optimization, there are three key areas: gap analysis, prescriptive methodology and documentary evidence http://www.nyba.com/wp-content/uploads/2013/04/Tech/Model_Risk_Management_May_2013.pdf
Critical analysis on the usage of the model should be done subsequent to the development/implementation stage to assess whether the model is functioning as effective as it intended. If gaps are identified, processes should be established to allow enhancement to the model. In addition, feedback via all channels by the users should be encouraged to provide ideas to enhance the model as well.\footnote{18}

**Model Validation**

What is model validation? Model validation is performed to assess whether the models are performing as expected and in-line with the desired objectives. As stated in the OCC 2011-12, “Model validation is the set of processes and activities intended to verify that models are performing as expected, in line with their design objectives and business uses. Effective validation helps ensure that models are sound. It also identifies potential limitations and assumptions, and assesses their possible impact.”\footnote{19} Therefore, all components in a model, including input, processing and reporting, should be validated to ensure that it meets the risk model’s objective, whether the model is developed in-house or purchased externally from an outside vendor. The validation must also be continue on an ongoing basis.

There are a number of reasons why model validation is important to the AML program. First of all, it will serve to make an assessment of the model’s performance. Taking into consideration the various sizes and scales of different FI’s, each FI must customize its validation program to assess whether the business objectives have been met. Secondly, many AML risk models have been in use for five to 10 years without any modifications. As mentioned in the OCC 2011-12, models should be tuned every 12 to 18 months, by an independent party.\footnote{20} Lastly, regulatory requirements makes it critical to perform the validation. The CCO might be required to certify that the risk model is working effectively and the validation would be a good way to validate that.

OCC 2011-12 states that for a validation framework to be effective, the framework should compose of three core elements:\footnote{21} 1) Evaluation of conceptual design, 2) Ongoing monitoring, and 3) Output analysis.

**Evaluation of Conceptual Design**

Ensure that the conceptual design and capabilities of the AML model meet the identified business and regulatory requirements. During the assessment of the conceptual design of the


\footnote{19} OCC 2011-12 section V model validation, page 9, definition of model validation

\footnote{20} AML Model Risk Management and Validation: Introduction to Best Practices, ACAM today, 28 Aug 2014

\footnote{21} OCC 2011-12 page 7 elaborates the key elements of comprehensive validation with three core elements:

- Evaluation of conceptual soundness, including developmental evidence
- Ongoing monitoring, including process verification and benchmarking
- Outcomes analysis, including back-testing
model, management should also ensure that key indicators and developmental evidence are available and maintained to properly reflect the risks in the risk model. For example, to properly document/explain factors, such as the corporation’s products, services, customers and its associated risk with the AML risk model.

**Ongoing Monitoring**

The validation should be performed on an ongoing basis, which includes system, data and process validation. Systems should be checked and validated to ensure that the system is developed as desired so that system functionality such as system limitation and data integration are working properly as designed. Data should be validated to ensure information is captured accurately and completely. Lastly, the process should be validated to ensure that the design and the sustainability of the process is adequate, with particular focus on reconciliation, output controls and system controls to ensure accuracy on the output.\(^{22}\)

Senior management might think that once the AML model is in place and has been validated, no further work is necessary. This is conceptually incorrect and it should be noted that periodic and ongoing review is still required even after the initial data validation has been completed. For example, an upgrade may be required, a change may have been made by the FI to the transaction codes, or new products may have been developed. Therefore, any change to the model could affect the accuracy and effectiveness of the AML model. Periodic validation will ensure that the model will continue to function even after modifications have been made due to markets, products or regulatory requirements, maintaining the FI’s risk model objective.

**Output Analysis**

The regulatory guidance also makes clear that a critical component of model risk management is output analysis, which is to compare the model output to corresponding actual outcomes, to evaluate the model to ensure that it is performed as it is intended with accurate output as predicted. If there are discrepancies, the FI should take action to remediate the errors/issues. In addition, the output analysis along with the discrepancies, should also be reported to senior management. Ultimately, model validation comes down to the overall governance being practiced by the FI. Models are only as effective as the structure in which they are used.\(^ {23}\)

**Conclusion**

In recent times, there have been numerous cases of regulatory breaches, which were the result of failure to appropriately manage AML model risks. This has led to fines, penalties and

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\(^{23}\) OCC 2011-12 section V, model validation, page 14: the guidance provides clarification on the importance of output analysis
enforcement actions. Therefore, regulators have increased focus on scrutinizing FIs to review the model risk management, including the AML model program. The onus is on the FIs to prove that their approach towards regulatory compliance is serious by showing details of their compliance monitoring program. Therefore, it is paramount for the FI to have a sound risk model framework as required by regulators to avoid fines and reputational damages. In addition, the proposed regulation by the NYDFS to have the COO perform annual certifications has increased the responsibility for the FIs to ensure a robust TM system is in place.

What comprises a sound risk model framework? According to the OCC 2011-12 guidance, elements of a sound model framework will include model governance, development, and validation, comprising of system administration, understanding system limitations, change management controls, data integrity and testing of source transactions, and validity of reporting parameters.24

In order to employ a risk model for an AML program, it is critical that FIs invest time and resources to understand model parameters and progressively develop the model to best meet the FI’s needs. However, not all FIs have the resources to develop such model in-house. Therefore, small to medium-sized FIs, or even larger FIs that do not have such expertise, will find it beneficial to partner with an independent expert in AML program modeling. Such expertise not only helps build the model to meet regulatory expectations, but may also enhance the effectiveness of the model as well.

In view of the requirement, the following are some key items that should serve as a check list to a robust AML model:

1. The framework/objectives of the model must align with regulatory expectations.
2. “Off-the-shelf” solutions must match the FI’s AML risk profile, or the model must be customized to cater to the FI’s risk profile.
3. FIs must assess and develop the model appropriately. Otherwise, abnormal/suspicious transactions might not be detected, and the intended functions would not be working.
4. FIs should have the right resources and expertise to manage model risk. If resources are not available in house, external resources must be sought, and subsequently, have the knowledge transferred to the FI’s internal staff.
5. The models must be updated/revised on a periodic basis. Without such periodic updates, the model may no longer meet the FI’s objective/risk profile/regulatory requirement.

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24 OCC 2011-12 section III overview of model risk management, page 3, elaborate the key components of good model management.
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Supervisory Guidance on Model Risk Management

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