

Model Validation / Statistical Analysis



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MRM Effect on BSA/AML Program



- **BSA/AML Systems should be included in the model inventory**
 - Monitoring Systems (including manual reports)
 - Customer Risk Rating Tools
 - OFAC Fuzzy Logic
- **Enhanced expectation around documentation**
- **If some internal audit staff perform certain validation activities, then they should not be involved in the assessment of the overall model risk management framework**
 - To ensure that they are not evaluating their own work!
- **Validation expectations have not changed**
 - BSA/AML Models are just not subject to enhanced risk management practices

Annual Reviews and Validation Frequency



- **Standard in MRMG for firms to conduct an annual review of all models used**
- **Annual review should confirm that model is functioning as it should and validation conducted to date is still sufficient**
- **Materiality plays a key role, as annual reviews for less material models can have a much lighter touch**
- **One common misperception is that annual review is the same as an annual validation requirement – not true**
 - Annual review may just confirm that no new validation work needed
 - Or call for refresh of past validation work, or even full re-validation
- **Again, better to think of validation as an ongoing process**
 - Not appropriate to think of validations as discrete events with little work done in between

BSA/AML System Validations



Data Validations



- Ensure all appropriate transactions are flowing into the system and can be verified or reconciled.
- Test data mapping to ensure that fields are accurate.
- Validate data inputs into the BSA/AML system.
- Review data flow documentation to understand source, adequacy and completeness of imported data.
- Review to ensure that unposted or unprocessed items are cleared timely and incorporated into the transaction data feeds.
- Ideally, for transactions that are not fed into the system, ensure that the bank knows that they are not fed into the system and determine management's method for monitoring those transactions.

Rule or Parameter Validations



- Default settings/parameters are “starting places” only. Each financial institution must tailor settings/parameters to manage risk profile
- Review and evaluate rules, parameters, and thresholds used by the system
 - Should assess filtering criteria
 - Should assess alert scoring (if applicable)
 - Should assess quality and number of alerts
 - Should assess the rules in regards to bank risks (including geographies, products, services, customer base)
 - Should ensure that red flags are reasonably incorporated into rules or parameters.

Rule or Parameter Validations



- **Transactional testing should be completed to verify parameter adequacy. Can include:**
 - Above-the-Line Testing & Below-the-Line Testing (ATL & BTL)
 - Historical back-testing = using data in the system from the previous months/years
 - Reviewing actual transactions
 - Statistical Analysis
- **When is a scenario effective?**
 - Effective is measured by “meaningful” investigations.
 - A “meaningful” investigation could result in a “no SAR” decision
 - No magic # or % per scenario
 - Effectiveness will differ based on the intended purpose of the scenario
 - **IMPORTANT:** Testing results should never be driven by resources

Model Validations



- Provides confidence that the model itself performs as intended.
- Determines whether the model specifications and applications are appropriated developed.
- Determines if the system is operating free of material system defects.
- Determines whether reporting tools within the system are accurate.
- Should entail testing of the system, and if done on in-house software, transaction testing for your institution.

Model Validation / Statistical Analysis



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Model Documentation - Technical



- **Initial configurations at implementation and ongoing maintenance**
- **Maintain initial documents provided by the vendor during system implementation**
 - Should include description of method used to assign thresholds and any associated supporting data where applicable
 - Description of data elements, especially as relates to risk criteria and information required for risk rating or rule evaluation/execution
 - Clearly define related assumptions and system limitations
- **Create and regularly update system change logs**
 - Catalog and justify changes made to the system – rules created/deactivated, threshold changes, data element additions/deletions, etc.

Data Mapping & Data Documentation



- **Creation of data maps in 3 Parts**
 - List Destination Data Information - should include information expected by the receiving system (monitoring solution)
 - List Source Data Information – should include corresponding fields used to retrieve information expected by the receiving system.
 - Assignment of Look-Up values – where data values are formatted differently between the source system and the receiving system, ‘cross-reference’ tables are required
- **Unmapped fields or codes retained and reviewed regularly as part of the map cycle**

Data Map Sample



- Destination Headings

A	B	C	D	E	F	G	H	I	J
Seq #	Stream / Version	Column Name	Data Type	Start Position	End Position	Length	Possible Value	Description	Required?

- Source Headings

K	L	M	N	O	P	Q
Used by Which Scenarios?	Collected in a Source System?	Source System(s)	Source Field	High Level ETL logic	Source UI Field Name	Comment

- Look-Up Values

A	B	C	D	E
Source Code	Name	Include ?	Destination Code	Comment
1110		No		
1111		Yes	LOAN	

Scenario/Rule to Risk Alignment



- **Chart AML risk exposure points as identified in the BSA Risk Assessment**
 - Customer Risk
 - Product/Service Risk
 - Geographical Risk (both service area and transactional)
 - Separately identify highest risk
- **Overlay the risk detail with existing Rule Model**
 - Identify the exposure points that each rule addresses
 - “Plot” each on the Risk Chart
 - Evaluate the results

Alignment Matrix Example



Products	Risk Rating ¹		PEP Status Accounts	Multiple Accounts (M)	New Account Activity	Higher Risk Industries	Professional Intermediary	Non-Face to Face Accounts
	Inherent	Residual						
Retail & Commercial	Inherent	Residual						
Checking Accounts (DDAs, IOLTAs, IDAs, BTAs)	H	LM						
Savings Accounts	H	LM						
Time Deposits (CDs/IRAs)	HM	LM						
CDARs	HM	L						
ICS Deposit Agent	LM	L						
Night Depository Services	L	L						
SAV Bond Redemption	L	L						
Cash Services (Bulk Cash/Treasury Mgmt)	H	LM						
Consumer Lending	HM	L						
Cash Secured Lending	H	LM						
Private Banking	H	HM						
Mortgage Lending & Servicing	H	LM						
Sale of Monetary instruments: Official Checks	HM	LM						
ATM cards / AIT Services	HM	LM						
Debit Card	HM	L						

Detection Typology



- **Typical Model Types**

- Threshold based rules – minimum and/or maximum value parameters
- Velocity – transactions ‘in’ compared to transactions ‘out’; within a specific transaction type or cross-type
- Behavioral Deviation – measurement of transaction patterns outside of normal for a specific customer
- Profiling – a behavior deviation model performed at the customer level rather than by transaction

- **Detection Scenario Considerations**

- Customer Level Detection: NRA/PEP monitoring, Inordinate Number of Accounts, High Risk Industries
- Account Level Detection: Transaction specific monitoring – Cash, ACH/IAT, Wires, Checks/RDC
- Selection based on software/tools used

Threshold Validation



- **Validate thresholds through data analysis**
- **The indicative types of analysis performed to provide recommended settings are:**
 - Standard Deviation calculation for the thresholds on profiles
 - Transaction distribution by amount and count for various customer types, account types and transaction types
 - Transaction distribution by country/number of countries on a transaction
 - High keywords distribution analysis
 - Distribution of dormancy period for accounts

Model Validation Team



- **Independence of the Model Validation**
 - Internal Validation – typically performed by an audit team
 - Mixed Validation – internal and external resources used
 - External Validation – typically performed by one or more compliance consulting firms

Model Validation Resource Selection



- **Prior experience performing Model Validations**
 - Successfully received by management & regulators
 - Experience with AML or Core Banking systems used by the institution
 - Familiar with Risk Profile
- **Experience satisfying MRA's**
- **Audit approach using sound analytical methodology.**
 - Approach based upon OCC Bulletin 2011-12 & FRB 11-7
 - Be confident of the Analytical Component – Think of post-engagement positioning

Model Validation Skillsets & Additional Considerations



- **Team Composition**
 - Skilled in Project Management, Compliance, and Statistical Analytics.
 - Technical skills to satisfy the analytical requirement of MV.
 - Regular F/T Equivalents or contractors?
- **Deliverables & Support**
 - Work Paper package of test plans, test worksheets and documentation supporting findings and conclusions.
 - Address in Charter/Statement of Work
- **Pricing**
 - Fixed Price or Time & Materials
 - More than a One Time engagement
 - Discuss the Highest Cost Component