Rule Based Risk Rating (RBRR) and Post-Processing Methodology Overview

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Contents

II. Questions and Contact Information

Questions regarding compliance with this methodology document may be addressed to:

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Department:	Financial Crimes Compliance
Version Number:	2.4
Document Review Frequency:	Annually (Or as needed)

III. Revision History

Version	Date	Description of Change	Author	Approver
1.0	03/29/2019	N/A	Scott Schoenborn – EDD HCRM Manager	Matthew Willard
2.0	06/20/2019	Updated "Use of Assigned Points to Risk Rate Customers" section	Megan O'Toole & Oleg Khanyutin, EDD-CM Team Leads	Matthew Willard
2.0	06/28/2019	Updated Business Types and Tags sections	Megan O'Toole & Oleg Khanyutin, EDD-CM Team Leads	Matthew Willard
2.1	9/25/2019	Updates include: 1. Reflecting model adjustments related to weight re-scaling and points adjustments from 3Q2019 tuning. 2. Adding model limitations and mitigations. 3. Describing txn threshold setting process. 4. Adding details related to RBRR post-processing activities including segmentation, capping, and final scoring. 5. Describing final threshold setting process (quant + BTL/ATL)	Dennis Perezic, Megan O'Toole (assistance from Protiviti)	Matthew Willard
2.2	5/17/2020	Updates include: 1. Add model-focused section covering expanded assumptions and limitations, design, inputs, and outputs. 2. Updated product and NAICS methodologies	Dennis Perezic, Megan O'Toole (assistance from Protiviti)	Matthew Willard

Version	Date	Description of Change	Author	Approver
		3. Enhanced documentation on capping and added documentation on auto-high. 4. Revised parameter settings to be consistent with 2020Q2 model changes. 5. Expanded model change process steps		
2.3	7/1/2020	Updates include: 1. Revised auto high processing threshold for Business IAT	Dennis Perezic, Megan O'Toole	Matthew Willard
2.4	4/7/2021	Updates include: 1. Revised Model Limitations section 2. Revised "Product" Tab/Risk Component Section	Dennis Perezic, Megan O'Toole	Matthew Willard

IV. Customer Risk Rating Process Overview

Apple Bank ("the Bank") recognizes that assessing customer risk is an essential component of a comprehensive BSA/AML monitoring and risk mitigation program. In evaluating customer risk, the Bank does not rely on any one indicator but will weigh several indicators, including the risk identification and measurement of products and services, customer types, and geographic locations. The Bank recognizes that any customer account may be used for illicit purposes and that a spectrum of risks may be identified even within the same category of customers. For example, a customer account associated with a low-risk business type may still be recognized as higher risk due to being a new relationship, exhibiting significant cash activity, and having an association to a Politically Exposed Person ("PEP"). As a result, evaluating risk across multiple dimensions is critical to understanding the risk exposure presented by a particular account.

Within the risk rating process itself, the customer account is the primary unit that is being risk rated; however, to arrive at an account level risk rating certain customer level attributes are considered, which are further detailed within sections of this document. The Bank's assessment of customer risk factors is tailored to the unique risk profile of the Bank and its customers so that the Bank collects the necessary information about its customers to form an understanding of the nature and purpose of the account upon opening and throughout the relationship. This risk assessment process enables the Bank to develop a customer risk profile and determines the level and frequency of the Bank's monitoring and oversight.

The subsequent sections provide an overview of the risk rating model, its parameters and configuration, and processes supporting the operation of the model in a production environment.

Model Overview

A. Introduction

The Bank uses the Rule Based Risk Rating ("RBRR") module within Abrigo as its initial and ongoing customer account risk rating engine and further refines RBRR's output through Bank-developed RBRR extensions ("RBRRX"), also known as RBRR post-processing, to address
V. limitations, as identified by the Bank, within the RBRR module itself. For the purposes of this document, the Bank considers "the model" to be the collective logic of RBRR and RBRRX, as that is what dictates the final risk rating assigned to an account and, consequently, customers.

RBRR is a multi-institution product that enables Apple Bank (the "Bank") to systemically risk-rate accounts. The module uses a point system to calculate the BSA risk level of an account based upon a number of risk factors. In evaluating the level of risk on accounts, the Bank, generally, does not rely on any single indicator to determine the existence of high, moderate or low risk. The risk assessment process weighs a number of factors, including the risk identification and measurement of products, services, customers, and geographic locations.

Account risk is calculated using the following categories and account activity/account status:

- Product
- Zip Code (geography)
- Country (geography)
- TIN Code
- Business Type
- Transaction Activity
- Tags (account attributes)
- New Account
- New Customer
- SAR(s) Filed
- Auto high process for higher risk transactional activity

The following section(s) describes the model's assumptions, limitations, inputs, and design. Subsequent sections describe configured settings and their rationale as well as associated processes related to executing and maintaining the model.

B. Assumptions

The following identifies the Bank's key assumptions and guiding principles related to the model and its current implementation and settings. Specific Parameters and Configuration related to items described in this section are covered in more detail in a later section of this document.

#	Assumption	Impact on Model Design / Approach
1	The BAM+ data store, over which the model is built, receives the Bank's complete customer account portfolio from its source systems.	The model is built over the BAM+ data structures, which also support Transaction Monitoring, CTR, and SAR processing, and is considered by the Bank to capture the scope of its customer account portfolio relevant to its AML and Sanctions Screening programs. The Bank has separately performed data validations and has daily reconciliation controls in place for confirming receipt of the full set of source data.
2	A customer risk model should cover all 3 aspects of BSA/AML risk as set forth in regulatory guidance – i.e. • Products and Services • Geography • Customer	The model provides coverage of the 3 aspects of BSA/AML risk via various risk components within the model, as described in the section on Model Design later in this document.
3	The risk presented to the Bank by a customer is the risk presented by that of the customer's highest risk account.	The model rates risk at the account level, so this assumption relates to the interpretation of the results presented by the model rather than operation or design of the model itself – i.e., when determining the risk of a customer, the model outputs for that customer's accounts are evaluated to determine the customer's risk.
4	A generally balanced risk model presents the best representation of the risk an account presents to the Bank. Note: The Bank does recognize that each account can present its own set of risks such that there will be variations in influence produced by the points from the various risk components across accounts (i.e., the balance is in the potential or	• A *near* equal-influence approach has been taken toward the various component risk factors (e.g., Product, ZIP Code, Country, etc.) and any deviations from equal influence have been documented herein with the Bank's rationale for the deviation. • The behavior of RBRR's transaction risk pointing, which, without mitigation, can cause transaction risk to overdrive the model, has been addressed through weight normalization and points scaling within other risk components as well as through capping, and auto-high

#	Assumption	Impact on Model Design / Approach
	possible risk produced by the model components rather than the actual risk on any single account.)	capabilities in post-processing.
5	An account's product risk is influenced not only by inherent factors such as purpose, structural constraints, and typical use in facilitation of cross-border activity, but also by what services or capabilities of the product are utilized in relation to the account.	• The Bank measures its BSA/AML product and services risk exposure through inherent risk factors as represented through the model's Product risk component as well as through the exposure presented by specific, utilized services as represented through the model's Transaction risk component (e.g. a wire (service) sent from a savings (product) account.)
6	Accounts associated with domestic addresses generally pose less geographic risk than accounts associated with foreign countries; however, there are different levels of risk within each of these two categories.	• The Bank has slightly underweighted the ZIP Code risk component, which only applies to domestic customers, in relation to the Country risk component for which only foreign countries receive risk points, which has the effect of ensuring that the highest risk foreign country has greater influence on the overall risk score than the highest risk ZIP code. • The model accommodates variation in ZIP code risk by considering such factors as HIDTA/HIFCA rating of the area, the Bank's branch footprint, and US states vs. US territories. • The Bank uses the IBM Financial Crimes Geographic Risk Insight list as a guide when setting its country risk ratings, which rates each country based on a variety of factors/exposures using recognized governmental or third-party sources which provide coverage of AML-relevant exposures including sanctions, state sponsors of terrorism, primary money laundering concern jurisdictions, and corruption.
7	Businesses generally present a greater money laundering risk to the Bank than individuals.	• The business type risk component has been given greater weight than consumer (individual) risk components. • RBRR post-processing permits the Bank to set separate final risk thresholds for businesses vs. individuals since this capability is not possible within RBRR.
8	Activity risk exposure presented by an account to the Bank increases with both value and volume of	• Transaction risk pointing increases based on both value and volume of transactions. • Auto-high processing considers accounts with

#	Assumption	Impact on Model Design / Approach
	transactions on the account.	multiple months above the Bank-determined thresholds to be High risk as this capability is not possible within RBRR.
9	Recent account behavior is an important consideration when determining its risk.	• Transactional behavior is a component of the risk model, and the lookback period for determining transaction risk is one quarter, which corresponds to the risk rating cycle such that behavior changes are detected relatively quickly. • The lookback period for auto-high determination uses the same period as that used for transaction risk processing, above. • Recent SAR activity is a component of the risk model.
10	Newer customers and accounts present a greater risk than established customers and accounts	• The Bank has incorporated both customer and account relationship aging risk factors within the model.
11	Customers with behavior resulting in a recent SAR filing present a greater risk to the Bank.	The Bank has incorporated Suspicious Activity Report ("SAR") aging into its model so that accounts with recent SARs are risk-rated higher than a customer of otherwise similar risk without a recent SAR filing.
12	The risk presented by an account with a SAR filing is highest immediately after the SAR filing and decreases over time if the activity causing the SAR does not continue.	The Bank assigns the highest SAR risk points to those accounts with a SAR filing within the last 120 days. This 120-day period corresponds to the time that the account will have gone through Supplemental SAR Review (SSR) with the Financial Investigations Unit (FIU). If the SSR does not yield another SAR, then the risk points assigned to the account will be decreased starting at 121 days because the activity that triggered the SAR is no longer occurring.
13	The Bank needs to quantify risk in a more granular or focused manner than what is supported within the defined RBRR risk components of Product, ZIP Code, Country, TIN Type, Business Type, and Transactions risk components.	Extensions to the basic 6 component model occur both within RBRR, as well as in RBRRX, to fully address risk as it is understood by the Bank. These include: • The use of RBRR's Tagging feature, which allows Add-on points to be assigned to Bank-defined tags, or categorizations, that can be added to specific accounts in the form of a text "tag". Tagging has been used to target various population segments of concern including PEPs, accounts involved with 314(a) requests,

#	Assumption	Impact on Model Design / Approach
		home-based businesses, trusts, and Non-Resident Aliens (NRAs). • The Bank has incorporated customer and account aging as well as SAR activity into the model through RBRR's "Other" rules capability. • Segmentation has been added in RBRRX to address the need to independently rate businesses and individuals on their own risk scales. • Auto-high capability has been added in RBRRX to address high risk activity in a manner not supported in the basic RBRR model.
14	Closed accounts do not require ongoing risk rating.	The model has been configured to not risk rate closed accounts. • Since they are not transacting, closed accounts do not present an ongoing risk to the Bank, and their risk does not need to be kept current. • Excluding closed accounts from risk rating prevents their risk from being reduced over time – potentially presenting a less accurate historical view of the Bank's risk exposures.[1]
15	Cash activity presents a higher risk to the Bank due to its use during the placement phase of money laundering.	• In addition to capturing cash activity within its transaction risk component, the Bank has set specific cash activity levels that will automatically set the account's risk to high. • Traditionally cash-intensive businesses, based on their business type, have been rated high risk within the business type risk component of the model.
16	International Wire and IATs (International ACH Transactions) present a higher risk to the Bank due to their cross-border exposure and potential for flow through banks that may have less stringent controls than US banks and/or involvement in international	• In addition to capturing international wire activity within its transaction risk component, the Bank has set specific international wire activity levels that will automatically set the account's risk to high by RBRR post-processing since transaction auto-high is not a feature of RBRR. • The Bank has set specific IAT activity levels

[1] Over time the account's last transaction activity would move outside the lookback window for transaction risk and auto-high evaluation, which will tend to produce a historical view of the accounts that is lower risk than it was at the time when the account was open. As such, a closed account's risk is "frozen" as of the last risk rating performed prior to closure.

#	Assumption	Impact on Model Design / Approach
	sanctioned or criminal activity.	that will automatically set the account's risk to high during RBRR post-processing. (See also the IAT limitation in Model Limitations below.)

C. Model Limitations

The following table identifies known model limitations and how they have been addressed by the Bank. The model limitations identified in this section are regularly assessed over time as part of ongoing monitoring.[2]

#	Limitation	How the Bank has Addressed
1	Transaction Activity risk is not constrained to 5 points as is the case for other weighted component risk factors such as those for Product, ZIP Code, or TIN Type, which can cause transaction risk to have an outsized influence on the overall risk score. This lack of constraint is because each type of risk-rated activity on an account can get up to 5 Amount (value) risk points as well as up to 5 Count (volume) risk points. This can result in cumulative transaction risk points of 30-50 points or more and be the source of significant run-to-run risk level movement (prior to mitigation).	The Bank has performed a risk weight scaling exercise to balance the influence of transaction activity risk and, in addition, it has added transaction risk point capping as an RBRR post-processing step that maintains improved risk influence balance for those outlier transaction activity situations where even the re-scaled weighting is being overwhelmed by the transaction activity points. Note that the capping, which affects ~1% of the total account base, merely ensures that high risk transaction activity contributes a similar influence upon the overall risk score as the highest risk points coming from other equal influence risk factors such as Country. The Bank has further augmented capping with Auto High functionality as part of RBRR post-processing to ensure that its highest risk activity continues to receive review attention.
2	Business and Individual accounts have a differing set of risk factors but do not have separate risk thresholds within RBRR nor does the structure of the RBRR module currently enable this.	• The Bank has implemented population segmentation and separate individual and business risk level thresholds as a post-processing step after RBRR has executed so that the risks of these two segments are more accurately understood and addressed through separate risk tiers for individual and business customers. • The Bank has a parameter update script

2 As of May 2020, FCC and MRM are working to define ongoing monitoring, which will address the uniqueness of the BSA/AML models.

#	Limitation	How the Bank has Addressed
		used for adjusting the risk thresholds maintained outside of RBRR.
3	For C&I accounts, the RBRR module does not distinguish between customer and non customers when it rates the various risk factors that make up an account's risk rating. Given that there is no regulatory obligation to develop customer risk profiles for non-customers, this lack of distinction between customers and non customers may skew the overall risk of its customer base, as well as trigger periodic reviews for accounts not belonging to actual Bank customers.	The population of non customers in the RBRR repository is low (i.e., less than 1% of accounts) and the impact on the overall risk of the customer base is minimal. The Bank has implemented five new account types for C&I loans [3] that allow the Bank to better delineate between customer and non customer accounts. These new account types help the Bank to remove non customer accounts from the final model output.
4	Accidental duplicate entries in the various risk pointing tabs in RBRR can cause the overall risk score to be higher than expected.	Even though the duplicates will result in a more conservative scoring, for consistency with correctly entered items, the Bank has worked with the vendor to create a duplicate entry monitoring report that is executed and reviewed after assigning any new points and before performing the risk rating run during each quarterly risk rating to ensure that any duplicates can be removed before they impact the risk rating.
5	Transaction capping, which was introduced to address another limitation as explained above, can reduce the risk level on a few accounts exhibiting high risk behaviors when those behaviors are on accounts that also have other risk rated activity (e.g., transfers).	As part of model post-processing, the Bank has implemented an Auto-High capability to execute after capping. The Auto-High capability permits detection of elevated levels of Cash, IAT, and International Wire activity – the 3 highest risk activity types at the Bank. When activity above pre-determined thresholds is detected, the model will conservatively set the account's risk to High regardless of other factors or influences within the model.
6	The RBRR module[4] does not distinguish IATs from domestic ACH activity when it rates	The Bank has included with its Auto-High capability, as described above, the ability to separate the IAT activity from normal ACH activity so

[3] The C&I loan portfolio makes up a very small portion (i.e., less than 1%) of the Bank's total customer population.

[4] The actual root cause of lack of IAT visibility within RBRR is that the account monthly summary table does not have a breakout for IATs. Post-processing mitigates this issue by accessing the transaction detail directly.

#	Limitation	How the Bank has Addressed
	transaction activity. Given that IATs are one of the highest risk transaction types that the Bank processes, this lack of discrimination between domestic and international activity reduces the Bank's ability to target for review accounts conducting these types of transactions.	sustained, higher value IAT activity will be pushed to high risk where it will be subject to EDD review, if activity meets Bank-determined thresholds. Unlike the activity rated within the Transaction risk component this functionality is independent of whatever domestic activity is also present on the account.
7	Risk rating occurs at the account level rather than the customer level.	The Bank has defined the customer risk rating as a derived measurement, which is conservatively considered by the Bank to be the rating of that customer's highest rated account.
8	The structure of the RBRR SAR risk rating rules do not permit increasing the risk of the account as the number of SARs increases beyond the first SAR.	The Bank has configured the existing rules such that the SAR risk will increase immediately with the first SAR filing, and, should the activity continue as monitored by the FIU during the Supplemental SAR Review (SSR) period, the elevated risk level will be sustained as a result of filing of another SAR. In addition, should the SSR process yield ongoing SAR filings, the account(s) will be subject to the Bank's Multiple SAR (MSAR) review process, which is done under the direction of the Bank's SAR committee. The SAR Committee will review the details of the SAR(s) and take action to mitigate risk and/or close the account. As a result, the Bank has addressed the increased risk through ongoing focused monitoring of these accounts and, where applicable, de-risking.
9	The RBRR module does not have the capability to automatically set an account's risk to high based on activity alone.	Auto-high capability has been added in RBRRX to address high risk activity for cash, international wire, and IATs.

1.

D. Model Design

Background

The model consists of Abrigo's RBRR combined with customer post-processing logic that executes after RBRR. Since a significant portion of the model is contained in the vendor's proprietary code within RBRR, some parts of the model's design can only be understood from a functional standpoint such that the design presented here is a logical view of the Bank's understanding of the model's operation and its applicability to the Bank's needs based on vendor documentation[5] and its evaluation of the model's outputs. This understanding has been further enlightened through communications with the vendor as well as through independent model validations. For the custom post-processing logic, the functionality and the Bank's rationale for its design and configuration are described in detail in this section and later in the section on Model Parameters and Configuration.

Guiding principles

When adapting the model to the Bank's unique needs and risk exposures, the Bank has considered the following:

2.

- FFIEC guidance on BSA/AML risk
- The Bank's BSA/AML Risk Assessment
- Feedback from prior Bank examinations, independent model validations, and audits
- Industry trends and best practice
- Mitigating controls and processes within the Bank related to various risk exposures

The Bank recognizes that a customer risk rating model should address the 3 major areas of BSA/AML risk – specifically:

- Geography
- Products and Services
- Customer (also known as Entity)

These three major areas of risk are addressed within the model, as shown in the table below. Each of these components are covered in more detail in the section on model Parameters and Configuration.

BSA/AML Risk Dimension	Model Risk Component Coverage	Risk Assignment Basis
Products and Services	Product	Inherent risk factors associated with the product such as the degree of liquidity the product provides, its complexity, and its potential to be leveraged in recognized money laundering schemes.
	Transaction	Degree of utilization (threshold-based) of specific services or capabilities such as wires, ACH, and Remote Deposit Capture.

[5] Please see BAM Rule Based Risk Rating User Manual published by Abrigo for the currently installed version of the product for additional details on the operation and configuration of RBRR.

BSA/AML Risk Dimension	Model Risk Component Coverage	Risk Assignment Basis
		Utilization is measured via both value (monetary amounts) as well as volume (count of transactions)
	Auto-High	Activity associated with select high risk services exceeding pre-determined thresholds. The higher risk services are cash deposits/withdrawals, receipt of IATs, and receipt and transmission of international wires.
Geography	ZIP Code	The domestic (US) ZIP code associated with the account's address – and, specifically, incorporation of awareness of the ZIP codes proximity to the Bank's branch footprint, HIDTA/HIFCA intersections, and non-US state addresses (US territories and military addresses)
	Country	The country associated with the account's address. Country risk is based on a variety of influences including state sponsorship of terrorism, degree of corruption, and strength of its financial system and controls as compiled and computed via IBM's Financial Crimes Geographic Risk Insight service.
Customer	TIN Type	Type and certification (W9) status of the tax identification number (TIN) associated with the account.
	Business Type	Business type risk rating methodology (maintained in separate worksheet) that captures several risk-relevant factors including whether the business type is traditionally cash intensive, its potential for cross-border exposure, and whether it can be a facilitator for terrorism (e.g., flight schools).

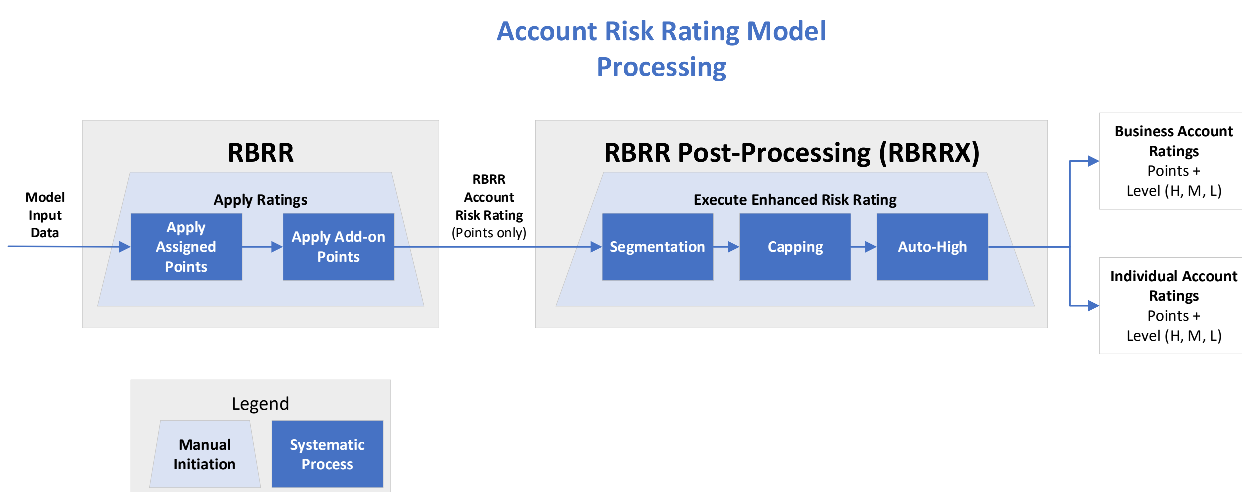
BSA/AML Risk Dimension	Model Risk Component Coverage	Risk Assignment Basis
	Transaction	Value and volume activity thresholds aligned to specific transaction types within product group as follows: • ACH • ATM • ATM In • Cash • Checks Paid • Monetary Instrument • Monetary Instrument Cash In • RDC • Transfer • Wire • Wire International
	Tags	Bank-defined population segments that capture a variety of risk factors not otherwise captured in the structured portion of the model including whether the account has been subject to a 314(a) request, whether the owner is a foreign or domestic PEP, and whether the account belongs to a non-resident alien.
	Other – SAR age	The number of days since the last SAR was filed on the account. The risk is elevated for a period of time after the SAR filing and reduced in 2 steps corresponding to age of SAR.
	Other – Customer Relationship age	The number of days that the customer relationship has been established. The risk is elevated for a period after establishment of the customer relationship.
	Other – Account Relationship Age	The number of days that the account relationship has been established. The risk is elevated for a period after

BSA/AML Risk Dimension	Model Risk Component Coverage	Risk Assignment Basis
		establishment of the account relationship.
	Post-Processing – Capping	Whether the transaction component is overly driving the risk rating due to its "unbounded" nature, which can overwhelm the inherent risk factors within the model.
	Post-processing – Auto-high	The customer's activity – via account transactions – exceeds defined thresholds for the higher risk activity types of cash transactions, IATs, and international wires.

The Bank's balanced view of risk across the various risk dimensions as represented by the above model components is reflected in the parameter settings that control the contribution of each one. These are described in the section on Model Parameters and Configuration later in this document.

3. Model Functionality

The model is considered by the Bank to be the *combined* logic of RBRR and RBRRX, which augments the original RBRR module's risk rating to address specific limitations as outlined in the above section covering those limitations. A logical view of the major model components of this combined process that produces the model output is shown in the diagram below:



As per the above, there are two points of manual initiation – one to start the RBRR "Apply Ratings" steps and one to start the "Execute Enhanced Risk Rating" steps.

The following table provides a brief description of each of the major steps in the model processing identified above along with the calculation or impact each step contributes to the final risk score and risk level produced by the model. The points and weights identified below are all adjustable, and the specific adjustments that have been set are covered in the Model Parameters and Configuration section later in this document. In addition, the RBRR User Manual provides further information on the operation of RBRR itself.

<table>
<tr><th>Step</th><th>Step Name</th><th>Purpose</th><th>Final Risk Score Contribution in this Step</th><th>Final Risk Level Contribution in this Step</th></tr>
<tr><td colspan="5">RBRR Processing</td></tr>
<tr><td>1</td><td>Apply Assigned Points</td><td>Calculate risk rating for the weighted components of the model by summing their weighted contributions</td><td>Assigned Points =
Product weight * Product points +
ZIP Code weight * ZIP Code points +
Country weight * Country points +
TIN Type weight * TIN Type points +
Business Type weight * Business Type points +
Transaction weight * Σ Transaction points

Note that Transaction points are assigned based on thresholds set for amounts and counts at the account type and product group levels for the following transaction types:
ACH
ATM
ATM In
Cash
Checks Paid
Monetary Instrument
Monetary Instrument Cash In
RDC
Transfer
Wire
Wire International
As such the transaction component is essentially only bounded by the number of transaction types for which count and amount thresholds have been set.</td><td>n/a</td></tr>
<tr><td>2a</td><td>Apply Add-On Points - Other</td><td>Add risk points for Other risks</td><td>Add-on Points =
SAR Age points +
Account Relationship Age Points +
Customer Relationship Age Points</td><td>n/a</td></tr>
</table>

Step	Step Name	Purpose	Final Risk Score Contribution in this Step	Final Risk Level Contribution in this Step
		(all aging-related)	(Please see the Model Parameters and Configuration section later in this document for additional details on the aging parameters and points)	
2b	Apply Add-On Points - Tags	Add risk points for account Tag risks	*Add-on Points* = *Add-on Points* + Σ *Tag Points* (Please see the Model Parameters and Configuration section later in this document for specific tags currently in use)	n/a
3	RBRR Account Risk Rating	Produce RBRR output	*RBRR Risk Score* = *Assigned Points* + *Add-on Points*	n/a[6]
Post-Processing				
4	Segmentation	Segment the account population into business and individual accounts so that segment-specific risk thresholds can be applied.	n/a	If Business Type is populated OR TIN Type is an Entity's TIN OR TIN Type is a Tax Exempt TIN Then *Assigned Segment* = "B" (Business) Else *Assigned Segment* = "I" (Individual)
5	Non Customers	Remove the non customer account population from the model output such that non customer accounts are not treated like customer accounts	n/a	If Product Type is a "LAR," remove from the model output.
6	Capping	Apply a pre-determined	If *RBRR Transaction Risk Points* > *Transaction Risk Points Limit* Then	*Scored Risk Level* = "Low", "Moderate", or

[6] RBRR assigns a risk level even though the risk level assignment functionality has been replaced by post-processing. However, the thresholds have been set within RBRR for this risk level such that all accounts will receive the same risk level of "Low". The RBRR-produced risk level should *not* be used as an indicator for account risk.

Step	Step Name	Purpose	Final Risk Score Contribution in this Step	Final Risk Level Contribution in this Step
		limit to the "unbounded" Transaction risk component to balance its overall influence with that of other risk components	*Scored Risk* = *RBRR Risk Score* – *RBRR Transaction Risk Points* + *Transaction Risk Points Limit* Else *Scored Risk* = *RBRR Risk Score*	"High" based on *Assigned Segment* and *Final Risk Score*.

7	Auto-High	Ensure that higher risk activity will still receive attention regardless of other factors or influences in the model such as capping.	If Account qualifies for Auto-High and *Scored Risk Level* <> "High" then
			Final Risk Score = *Segment's minimum threshold for High Risk*
			Else
			Final Risk Score = *Scored Risk*
			
			e.g., If the Business minimum threshold for High risk is 39 and a Business account receives a score of 30 prior to auto-high, but it qualifies for auto-high, then that account's score will be set to a final score of 39. If, however, with the same threshold, a Business account scores 42 before auto-high and it qualifies for auto-high, then the score remains 42.
				If the activity for at least *n* months over a period of *p* months at the tax identifier level is greater than the *Assigned Segment*'s threshold for any of:
				• Cash
				• IAT
				• International Wire
				Then
				Final Risk Level = "High"
				Else
				Final Risk Level = *Scored Risk Level*
				
				Note: As of May 2020, *n* = 2 and *p* = 3.

Additional details on the RBRR portion of the model may be found in the RBRR User's Guide as well as the section on Model Parameters and Configuration. The following sections describe the design rationale for the post-processing components in more detail.

a) *Segmentation*

The Bank incorporated segmentation into its model in October of 2019 to address the fact that RBRR by itself had only one set of final risk level thresholds (i.e., it does not support segmentation) Given that businesses and individuals generally had differing numbers of contributing model components – e.g., businesses would receive business type risk points whereas individuals would not – this could lead to risk level thresholds that were set too high for individuals or too low for businesses, even though they could be presenting similar risks to the Bank. As a result, the Bank added post-processing segmentation using the logic described above to permit parameter-based independent threshold settings controlling the final risk level assignment of High, Moderate, or Low for businesses and individuals.

The rules for segmentation are as follows:

Seq #	Rule Condition	Assigned Segment if True
1	Business Type Is Populated	Business
2	TIN Type is one of: 1 (Certified EIN) 3 (Uncertified EIN) EIN (EIN from McCracken)	Business
3	TIN Type is 9 (Certified Tax Exempt)	Business
4	n/a - Anything else [7]	Individual

b) Capping

Since the model implementation, , the Bank was experiencing significant swings in its high and moderate risk level account populations between monthly/quarterly/off cycle risk runs and observed that the significant driver of this change was the transaction risk component of RBRR. In addition, due to the model structure within the RBRR module, the transaction risk component had no defined upper bound on the risk points it could produce as compared to the other risk components. For example, without any weighting applied, total transaction risk points of up to 30-50 points or more were produced by RBRR's transaction risk component, as compared to a maximum of only 5 points from each of the other Assigned Points components of the model, such as Product, ZIP Code, and Country. With this significant difference in the total possible points contribution of transactions versus the other components, the transaction risk was over-driving the overall risk score on many accounts. In the third quarter of 2019, the Bank underwent a tuning exercise to improve the balance – or relative risk contribution - of the risk factors within the model and to consequently improve the run-to-run stability of the model's output by reducing transaction influence to align more closely with other, mostly inherent, risk factors in the model.

The following adjustment levers to address this issue were available to and considered by the Bank:

1. **Adjusting transaction risk thresholds** – The Bank had recently (i.e., in the first quarter of 2019) gone through a threshold setting exercise with Abrigo[8] whereby it was comfortable with the risk points produced by the components of transaction risk – e.g., the monetary amount that would be considered high risk for ACH transaction activity. As a result, further adjustment of transaction thresholds within RBRR was eliminated as a viable option as it would result in thresholds or risk pointing of specific transaction types that was inconsistent with the Bank's

[7] As far as TIN Codes 7 (Tax ID Applied For) and 8 (Non-Certified Tax Exempt), no customer account should be assigned either of these values. Should a customer record be designated with either value, then this is a data quality issue requiring remediation by Branch Operations. The Bank has instituted a periodic review process to ensure that no customer account is coded with TIN Code 7 or 8. TIN Code 6 (W8-BEN E or No TIN) is assigned to the Bank's NRA population.

[8] Please refer to *Rule Based Risk Rating Optimization* created by Abrigo in March 2019. Note that the final risk level thresholds in that document have been subsequently superseded by those identified in this document due to segmentation.

current view of risk. Further, it was just the *combinations* of risk points produced when multiple transaction risk factors were present that was the concern – not the individual transaction risk factors themselves.

2. **Adjusting risk component weights** – By adjusting the weights of the various risk components within the model, the Bank could improve the balance of their relative contributions to the total risk score. Risk weight adjustment is performed within the RBRR module and is covered in more detail in the section on Model Parameters and Configuration later in this document.
3. **Limiting transaction risk points** – While not a lever within RBRR, this was an option that could be applied through RBRR post-processing that would permit treatment of the transaction risk component similar to the other risk component factors whereby it could be confined to a defined range of points.

Given the above, the Bank addressed the issue through risk component weight adjustments (#2), also known as weight normalization, as well as by placing a limit on the transaction risk points (#3), also known as capping. The combination of these two aspects of the solution are designed to work together. Specifically, for normalization, the Bank identified the transaction risk points' 99th percentile and considered that the "equal influence" line against which other risk factors would be normalized through weight adjustments. The 99th percentile was chosen so that transaction risk point outliers would not drive the point of normalization. With a weight of 1 applied to the transaction risk component, this same 99th percentile line, or number of points, was used to set the transaction points limit in RBRR post-processing – essentially placing a boundary on the transaction risk that matched the highest risk point level that could be contributed by the other normalized, equal-weighted factors of the model (e.g., Country risk, TIN Type risk, etc.).

As an example, if the 99th percentile for transaction points was determined to be 15 points, then any account with transaction risk points above 15 will have its transaction risk points set to 15, whereas any account with transaction risk points of 15 or below will pass through the capping process with points unchanged. The risk points contribution of other equal influence risk factors, such as Country and TIN Type, is controlled through configuration of risk factor weights in RBRR such that the points range produced by each will also be 0 to 15 points after weighting. Since the other risk factors have a range of 0 to 5 points before weighting, a weight of 3 is required for them to produce the same range of points as the transaction risk component. Further details on the weight normalization and transaction capping level setting and rationale may be found in the section on Model Parameters and Configuration later in this document.

Through internal review as well as input from the Bank's regulators during the Bank's exam in the fourth quarter of 2019, the Bank observed that a small subset of cash-intensive accounts, including cash-intensive businesses ("CIBs"), had undergone capping to the extent that their overall risk level was reduced from High to a lower level. Although the population of CIBs incurring a downward risk level change due to capping represented less than 1% of the account population, the Bank developed a targeted means for mitigating the side effects of capping on accounts exhibiting high risk behavior through addition of auto-high functionality to the model, which is described in the following section.

c) Auto-High

Auto-high functionality automatically sets an account's risk level to High if a configurable level of activity is detected over the RBRR rating period and focuses on the three high risk transaction types identified in the preceding table. The Bank introduced the auto-high capability to its model in May of 2020 to not only address some concerns identified with the scope of capping but also to further account for the way transaction points contribute to the score produced by the RBRR module.

As described in the prior section, capping had the side effect of unintentionally lowering the risk on a few accounts that were exhibiting truly high-risk behavior. As a result, the Bank required a way to allow certain accounts exhibiting defined levels of high-risk activity to continue to be rated as high risk regardless of the effects of capping.

Further, even after the weight normalization exercise noted in the above section on capping, the Bank recognized that certain combinations of activity – even if very high risk – could still yield a less than high risk score from the transaction component. For example, an account with high risk cash activity by value could, at most, receive 5 points from transaction risk due to the RBRR points structure. In addition, by way of the RBRR module, one could not determine whether the activity occurred all in one month or if the activity were sustained high risk activity over a larger portion of the rating period. From an account risk standpoint, the Bank generally considers sustained, multi-month activity to be higher risk than single month spikes, which is generally the coverage domain of its transaction monitoring and CTR programs.

Finally, although RBRR permits risk rating of ACH activity, it does not provide the ability to rate IATs separately and on a more conservative rating scale given the international exposure that they present. Whereas RBRR operates off the account monthly summary data, IATs can only be identified within the detail transaction data such that the IAT level of granularity is inaccessible to RBRR processing.

For these reasons, the Bank designed and configured the Auto-High functionality to set the account to High if, for more than half of the months in the rating period, activity at or above a parameter-defined level of activity was detected in *any* of the three high-risk transaction types.[9] The evaluated activity is based on total throughput, which is defined as follows, for each of the high-risk transaction types:

- *Total Cash Activity = Cash In Amount + Cash Out Amount*
- *Total International Wire Activity = International Wire In Amount + International Wire Out Amount*

[9] For example, for quarterly ratings, an account must have had the defined level activity by value for at least one of the high-risk transaction types for at least 2 of the 3 months of the rating period to qualify for auto-high.

- *Total IAT Activity = IAT Credit Amount + IAT Debit Amount*
    - Note: For IATs, the Bank operates as a Receiving Depository Financial Institution (RDFI) only. However, the Originating Depository Financial Institution (ODFI) can originate both credits and debits which will appear on the Bank's inbound IAT stream.

Originally, the evaluated level of activity for auto-high was based solely on the rated account's activity. However, after initial qualitative review to confirm the initial auto-high thresholds, the Bank observed that there were a few customers exhibiting activity at or above the defined auto-high level; however, this activity was spread across multiple accounts such that no single account was exceeding the auto-high threshold. This observation led to the Bank making a change to the auto-high logic during testing so that activity across all accounts sharing the same TIN is aggregated, and that aggregated amount is evaluated against the auto-high thresholds. The qualifications for setting an account's risk to High by auto-high processing is as follows:

- Account must have a populated TIN on which to aggregate
    - Note: This qualification is needed due to a source data issue with McCracken that the Bank is aware of and is in the process of addressing whereby it is sending blank TINs into BAM+, which would cause incorrect aggregation for the purposes of auto-high amount calculations. As of May 2020, this issue affects approximately 600 McCracken accounts; however, it only affects the auto-high functionality on about 65 Commercial and Industrial accounts, or less than .02% of the total account population. This sub-population was analyzed further for impact, as follows:
        - Based on an analysis of these accounts from the first quarter of 2020 whereby the primary name on the account within BAM+ was used as a surrogate for tax id when computing auto-high aggregations, 57 of the accounts would qualify for the high-risk population based on the business auto-high thresholds for international wire activity, which is the typical high risk transaction type associated with Commercial and Industrial accounts. The following summarizes these 57 accounts:
            - 5 customers are involved.
            - 16 of the 57 accounts are already rated High for other reasons and this population also fully covers 1 of the 5 customers.
            - Of the remaining 4 customers with 41 accounts that would be new to the high-risk population:
                - 2 of the customers involving 12 accounts have some accounts rated High so the Bank's relationship focused EDD review process is expected to cover these.

        - 1 of the customers involving 5 accounts have some accounts rated Moderate so the Bank's relationship focused EDD review process is expected to cover these.
        - 1 of the customers, which is the government of a low risk jurisdiction in Africa, has 24 Commercial and Industrial loan accounts that are all rated low risk, and their activity appears to primarily consist of inbound international wires (no Cash or IAT activity) which would be consistent with normal loan payments on a Commercial & Industrial loan for an international customer.
    - As such, while auto-high will add some of these accounts to the high-risk population based on current thresholds, there does not currently appear to be a significant under-monitoring concern with these accounts, and their addition to the high-risk population once the issue is resolved is not expected to materially impact the EDD review population, though the mix of which accounts are Low, Moderate, or High within a few relationship groups that are already under review will change to include more High risk accounts.   .

- Account TINs must match to be included in aggregation
  - The Account TIN is based on the Account TIN associated with the account at month-end of the last month in the rating period.
  - The BAM+ TIN field used by auto-high processing includes the following special cases:
    - For accounts where an NRA is the primary account holder, the tax id field contains the Customer Information File (CIF) identifier such that auto-high aggregation for NRAs will be based on their CIF identifier.
    - Leading zeroes are stripped off during BAM+ processing such that it is possible to have a less than 9-digit TIN in the data. The tax identifier remains a unique identifier for the customer, however, and so does not impact auto-high aggregation.
    - Several attorneys have Bank accounts associated to services provided through New York State's Interest on Lawyer Account ("IOLA") Fund, which has been set up to assist low income individuals in the state of New York with civil legal problems affecting basic needs – such as food, shelter, jobs, and access to healthcare. All these accounts are associated with the IOLA fund's EIN such that their activity – even though the attorney's themselves are unrelated - has potential to aggregate together for auto-high evaluation purposes. Based on an analysis conducted in May of 2020, out of the 123 IOLA accounts, only 6 of them registered any cash eligible for auto-high evaluation and only 3 of them registered any international wire activity

eligible for auto-high evaluation. However, none of them met the auto-high thresholds. The Bank recognizes that there is potential for a few of these accounts to be set to auto-high in the future, if the current behavior pattern on these accounts continues (e.g., the 6 cash activity accounts were transacting within 10% of the auto-high threshold for cash). However, the auto-high volume generated by these is expected to be extremely low and would not cause a material number of false positives that would detract focus from the intended high-risk population. Given their very limited expected volume, the Bank has taken a conservative approach and has not applied any special filtering to remove these such that should any of these IOLA accounts aggregate together and reach the auto-high threshold, they will follow the normal review process where the risk presented can be confirmed.

- TIN Types must be compatible for an account to be included in aggregation according to the following mapping:

TIN Type of Rated Account	Compatible TIN Types for Matching/Aggregation
0 – Certified SSN 2 – Uncertified SSN SSN – McCracken SSN	0 – Certified SSN 2 – Uncertified SSN SSN – McCracken SSN
1 – Certified EIN 3 – Uncertified EIN EIN – McCracken EIN 8 – Uncertified Tax Exempt 9 – Certified Tax Exempt	1 – Certified EIN 3 – Uncertified EIN EIN – McCracken EIN 8 – Uncertified Tax Exempt 9 – Certified Tax Exempt
4 – Certified ITIN	4 – Certified ITIN
5 – Uncertified NRA	5 – Uncertified NRA
6 - W8-BEN E or No TIN 7 – Tax Id applied for	6 - W8-BEN E or No TIN 7 – Tax Id applied for

- The account being evaluated for auto-high must have a non-zero level of activity for the given transaction type (i.e., Cash, IAT, International Wire)
  - This qualification was added to prevent non-contributing accounts with matching TINs from having their risk raised just because another account with the same TIN exhibited auto-high behavior of the given transaction type. In practice, it is likely, however, that these accounts will still be reviewed due to the post-model EDD account grouping that is performed when establishing the relationships to be reviewed. However, their exclusion from auto-high by this qualifier during the risk rating stage provides a more accurate picture of which accounts are driving the Bank's risk.

- The auto-high threshold, which is parameter-defined, must have been achieved for each of a parameter-specified number of months.
    - The Bank believes that those accounts exhibiting sustained high-risk behavior rather than those account that exhibit a single spike in activity are most important to review. For activity spikes, there are other controls such as transaction monitoring and CTRs in place. The Bank has chosen the number of months based on the principle that the account must have exhibited the parameter-defined level of activity for more than half of the rating period.

The auto-high parameters are set at the segment and transaction type level such that there are a total of 6 settings for amount (2 segments X 3 transaction types) and 6 settings for minimum number of months to qualify for auto-high. The Bank has set these parameters according to its understanding of what it considers high risk behavior for each transaction type and segment. The specific settings selected by the Bank are covered in more detail in the section on Model Parameters and Configuration.

Finally, the following scoring logic applies for auto-high:

- If the account is rated High after the capping step, then no change is made to the risk score.
- If the account is not rated High after the capping step, then the risk score is set to the high-risk threshold value for that account's segment, and the risk level is set to High.

E. Model Inputs

The model's direct Bank data inputs reside entirely within the Abrigo databases associated with BAM+, which are refreshed from the Bank's various source systems on a nightly basis. The Bank separately maintains formal data mapping and data lineage documentation from BAM+ back to the ultimate sources of this information within the Bank. This data lineage documentation is maintained by the Financial Crimes Compliance (FCC) Systems team and should be referenced for details on the BAM+ inputs; however, below is a summary of the key source systems providing input to the model via BAM+ processes as of May 2020:

Source	Type of Data
Miser (Core Banking System)	• Accounts, Customers, and Transactions except as listed below.
McCracken	• Commercial Real Estate (CRE) and Commercial and Industrial (C&I) Loan Accounts
DMI	• Commercial Real Estate (CRE) and Commercial and Industrial (C&I) Loan Payments
The Clearing House	• Inbound domestic ACH • IAT (via Electronic Payment Network)
WirePro	• Foreign and Domestic Wires

Source	Type of Data
BSA Manager	• Incoming Chase Wires • McCracken Loan Payments (via wire)
CXI Foreign Exchange	• Foreign Wires and Currency Exchange
Abrigo (via RBRR install and periodic updates)	• Enriched ZIP Code reference data including HIDTA/HIFCA county updates • NAICS 2012 List

The above inputs are loaded into BAM+ tables via Abrigo's proprietary load processes, and the below table provides a summary of key model functions and where each sources its data within the BAM+ and post-processing databases.

Model Component / Function	database.schema.table

• RBRR Product risk component
• RBRR ZIP Code risk component
• RBRR Country risk component
• RBRR Business Type risk component
• RBRR TIN Type risk component
• RBRR Other risk component
  ○ Account relationship age (based on open date)
  ○ Last SAR date
• RBRR Tag risk component
• Post-processing Segmentation
	• bsav2_abs001.dbo.master_account

• RBRR Transaction risk component
• Post-processing Auto-High
  ○ Cash and International Wires only
• Post-processing Transaction Capping
  ○ Indirect usage via the Transaction risk score
 	
(Note: Some of the master_account values are copied onto this table, as well, by BAM+ processing for end-of-month snapshot values)
	• bsav2_abs001.dbo.account_monthly
	  ○ Activity data is sourced to bsav2_abs001.dbo.v_transaction_detail via Abrigo internal ETL processing.

• Post-processing Auto High ○ IAT only	• bsav2_abs001.dbo.v_detail_transaction
• RBRR Other risk component ○ Customer relationship age (based on relationship start date)	• bsav2_abs001.dbo.master_portfolio

• Primary post-processing input
  ○ RBRR module output (base risk rating)
  ○ RBRR component risk rating detail (e.g., transaction risk points)
	• bsav2_abs001.dbo.risk_rating_result_detail_ex

Model Component / Function	database.schema.table
• ZIP code reference data	• bsav2_abs001.dbo.search_list

In addition, the following BAM+ and post-processing table inputs provide the model's parameters:

Model Parameters	database.schema.table
• RBRR risk component weights	• bsav2_abs001.dbo.risk_rating_factor
• RBRR risk point assignments for: ○ Product ○ ZIP Code ○ Country Code ○ TIN Code ○ Tags	• bsav2_abs001.dbo.search_list
• RBRR business type risk point assignments	• bsav2_abs001.dbo.business_type_code
• RBRR Transaction thresholds and risk point assignments	• bsav2_abs001.dbo.risk_rating_transaction
• RBRR Other risk point assignments ("Others" tab) ○ Customer relationship age points ○ Account relationship age points ○ SAR age points	• bsav2_abs001.dbo.risk_rating_others
• RBRR administrative settings ○ # of months for RBRR averages and post-processing Auto-high lookback ○ Whether to rate closed accounts	• bsav2_abs001.dbo.risk_rating_settings
• RBRR risk level thresholds ○ NOTE: Post-processing has taken over this function so although it is referenced it has no impact on the final risk rating)	• bsav2_abs001.dbo.risk_rating_rule
• Post-processing parameter settings for: ○ Transaction score limit (capping level) ○ Risk level thresholds ○ Auto-high thresholds	• [APPLE RBRRX].dbo.risk_parameter

The Abrigo "RBRR Parameters and Configurations Table Mapping" and the Bank's "RBRR Post-Processing Modules and Usage" technical documents may be referenced for further details about the data structures associated with the above settings and parameters.

F. Model Outputs

As shown in the above section on the design of the model, there are two primary outputs from the model:

- **Final risk score** – An account-level integer points rating that is produced based on calculations described subsequently that quantify the risk associated with a given account.
- **Final risk level** – An account-level rating of High, Moderate, or Low, based on the risk score or, if one or more Auto-High conditions are satisfied, a level of High regardless of the risk score. Both the risk level thresholds as well as the Auto-High activity thresholds are segmented such that there is one set of thresholds for Business and one set of thresholds for Individual.

The primary usage of the model's output is for identifying accounts whose relationship groups should be targeted for EDD review.

In addition to these primary outputs, post-processing records various traceability attributes as part of the model output including:

- Key RBRR data values used as input to post-processing including:
  - Account Id and Type as processed by RBRR
  - RBRR Run Date
  - RBRR Apply Id
    - The apply id is the unique run identifier for RBRR.
    - This plus account id and account type serve as the linkage between RBRR Post-Processing records and RBRR module output.
  - RBRR module final risk score
  - RBRR risk points for each risk component (e.g., Product = 15 points)
    - Note: Detail of the RBRR module ratings (i.e., evaluated values and points assigned) is retained in the RBRR table bsav2_abs001.dbo.risk_rating_result_detail_ex and not carried through into the post-processing output though this table is used as input to post-processing and is how the component risk points are derived for inclusion in post-processing and its output.
- Whether the account was subject to capping
- Transaction risk points after capping
- Risk level before auto-high processing (High, Moderate, or Low) – also known as the Scored Risk Level, as described in the model design above.
- Tested monetary amounts for Auto-High for Cash, IAT, and International Wire activity
- Minimum monetary amount (threshold) required for auto-high qualification
- Minimum number of months required for auto-high qualification
- Whether each of Cash, IAT, and International Wire satisfied the Auto-High conditions
- Post-processing date/time

These traceability elements can be used for reporting, future tuning exercises, or other analytics.

Additional detail on the technical aspects of post-processing and data structures which are output may be found in the separate "RBRR Post-Processing Modules and Usage" document.

This document is continued on the next page with Model Parameters and Configuration

VI. Model Parameters and Configuration

A. Introduction

The model consists of logic, as described in the prior sections, as well as specific parameter settings that influence the model's behavior. This section describes how the model's parameters, which govern the behavior of the model's logic, have been configured and the rationale for specific settings that have been applied. The model is configured using Abrigo views within the RBRR user interface as well as through execution of a defined stored procedure that sets the post-processing parameters.

B. RBRR Application

The RBRR module's user interface is comprised of 11 tabs (or "attributes/categories"), each of which either has assigned points ("Assigned Points"), a point add-on ("Add-on Points"), or an administrative ("Administrative") function, as summarized in the following chart:

	RBRR Risk Component	Function
1	"Product"	Assigned Points
2	"Zip Code"	
3	"Country"	
4	"TIN Code"	
5	"Business Type"	
6	"Transactions"	
7	"Others"	Add-On Points
8	"Tags"	
9	"Rules"	Administrative
10	"Settings"	
11	"Ratings History"	

As explained in the earlier section on Model Design, the components of the model corresponding to Tabs 1-6 are both risk-pointed and weighted, whereas the risk components corresponding to tabs 7 and 8 are risk-pointed only. The risk rating for a customer's account is calculated by adding points that are assigned by the Bank; in Tabs 7-8, additional points ("add-on points") are assessed based on applicable pre-defined parameters established by the Bank; and Tabs 9-11 are administrative[10] in nature. Each of these three functions are described in greater detail below.

C. Assigned Points Contribution to Customer Risk Rating

Risk Points Scale

RBRR uses a point system based on a Bank-assigned scale of zero to five points across the underlying components of each of the attributes/categories in Tabs 1-6 ("Assigned Points"). These points align to specific assigned risks, as follows:

1.

Assigned Points	Assigned Risk	Risk Level / Tier
0	Minimal	Low
1	Low	
2	Elevated	Moderate
3	Moderate	
4	High	High
5	Very High	

The risk level, or tier, is only a logical categorization of the 6-level (i.e., 0-5 points) risk scale for ease of use and understanding and is not directly manifested within the risk model at the risk component level. For example, if referring to high risk business types in the context of risk rating, one is generally referring to those business types that have 4 or more unweighted risk points.

In addition, given the multi-component nature of the risk model, just because one factor is at a given risk tier does not necessarily mean that the overall customer risk rating, which is also tier-based, will be at the same level.

2.

Risk Component Weighting

The RBRR model provides a weighting capability for determining the level of contribution of each assigned points' risk component to the overall risk score. The Bank believes in a holistic customer risk model such that each risk factor within the "Assigned Points" risk component of RBRR should generally have approximately equal influence (or contribution) when determining the overall risk score. However, to best align the model's configuration with the bank's understanding of its risk exposure across its account portfolio, this approximately equal influence principle has been further refined via the risk-based assignment of weights for each "Assigned Points" risk component as described here.

The default weighting for an approximately "equal influence" approach would naturally be to give each risk component a weighting of 1; however, because the Transaction risk component can produce more than 5 unweighted risk points due to the structure of the model, it has the capability to produce

[10] These tabs are used to control global settings of RBRR (e.g., number of months to look back for transaction ratings), set weights, and review a log of past ratings updates.

an outsized impact on the overall risk score, which is not the intent of the bank's balanced approach to risk. Specifically, because an account's activity may involve multiple transaction types which can each potentially produce transaction activity points for both count and amount, the transaction risk points can go well over the 5 maximum risk points of the other components of risk such as TIN Type, which is not in line with the Bank's approach to account risk rating. The Bank directly observed this in the form of significant swings in the risk populations at the moderate- and high-risk levels between the Bank's initial risk rating run in early April 2019 and its second run in early July 2019.

As a result, the Bank conducted a weight-scaling exercise during the third quarter of 2019 with support of a 3rd party consulting firm, to better align the model weights with the Bank's equal influence goals for its measurement of overall customer risk. As part of this weight scaling exercise, quantitative analysis determined that approximately 99 percent of the accounts produce transaction risk points of 15 points or less – with the remaining approximately 1 percent being considered outliers for the purposes of the scaling exercise.[11] This analysis over two consecutive quarters showed relatively stable distributions, as shown below:

April 2019 Transaction Risk Distribution			July 2019 Transaction Risk Distribution		
Txn Risk Points	# Accounts	Cumulative %	Txn Risk Points	# Accounts	Cumulative %
0	334164	70.75%	0	335015	70.85%
1	31516	77.42%	1	32170	77.65%
2	22052	82.09%	2	22342	82.37%
3	17424	85.78%	3	16206	85.80%
4	14046	88.76%	4	13801	88.72%
5	11683	91.23%	5	11694	91.19%
6	9940	93.33%	6	9439	93.19%
7	7045	94.83%	7	7193	94.71%
8	5313	95.95%	8	5279	95.83%
9	3998	96.80%	9	4179	96.71%
10	3481	97.53%	10	3476	97.45%
11	2592	98.08%	11	2755	98.03%
12	2105	98.53%	12	2171	98.49%
13	1609	98.87%	13	1716	98.85%
14	1229	99.13%	14	1274	99.12%
15	1010	99.34%	15	1037	99.34%
16	726	99.50%	16	721	99.49%
>16	2373	100.00%	>16	2407	100.00%

[11] Note that the 99th percentile occurred closer to 14 points, but 15 was

Legend	<95th Percentile	95-<99th Percentile	>= 99th Percentile

This 15-point level dictated that to maintain the goals of approximately equal influence, a factor of 3 must be applied to the other weighted components of risk that could only produce a maximum of 5 points (i.e., since 15 points = 3 x 5 points). Note that RBRR weights can only be adjusted in integer multiples.

Through the course of the weight scaling exercise, the "default" factor of 3 weighting was further adjusted by the Bank for certain risk factors to better align the risk contribution of the various risk factors with its understanding of the risks presented by the various factors and guided by an iterative qualitative review of the output from the weight-adjusted model. The following chart shows the assigned weight for each risk component (tab) in RBRR along with the rationale for the weighting selected:

Risk Component	Weight	Weighting Rationale
Product	2	Product underweighting. Overall product and services risks are shared with the Transaction risk component within the RBRR model. This is because some of the risk-impacting services or capabilities of the Bank's products are captured within the transaction types of the Transactions risk component (e.g., International wires are considered a higher risk product or service per regulatory guidance; however, their presence on an account would be reflected through the risk points received through the Transactions component of risk and not through the Product itself). So that the risk focus is on those accounts with atypical activity, a customer's usage of the activity-related services such as wires only impact the overall risk when that service or capability is used in a manner exceeding the norm.
ZIP Code	2	Domestic geography underweighting - As currently configured by the Bank, Zip Code and Country risk are mutually exclusive components of risk, and the Bank believes that the riskiest domestic geography should contribute less geography risk to the overall risk score than the riskiest international geography. As a result, with the current multipliers, domestic accounts can carry a weighted risk point range of 0 – 10 points for the geography component of risk, whereas

Risk Component	Weight	Weighting Rationale
		international accounts will carry a weighted risk point range of 0 – 15 points for the geography component of risk. In addition, a significant portion of the Bank's customer base are within the New York HIFCA and New York/New Jersey Region HIDTA, which are high risk domestic jurisdictions so underweighting provides improved differentiation between its expected customer footprint and its significantly fewer international customers.
Country	3	Equal influence principle. See also Zip Code for a comparison of domestic vs. international geography influence in the model.
TIN Code	3	Equal influence principle.
Business Type	4	Business Type overweighting - The Bank believes in a slightly overweight contribution for business type risk due to its importance in determining the overall inherent risk of a business, and based on the Bank's understanding that businesses generally pose a greater AML risk to the Bank than individuals. A weight of 4 was chosen over 5 to prevent its influence from overwhelming other factors within the risk model.
Transactions	1	Equal influence principle – Specifically, since the Transaction component can produce more than 5 points of risk, this component received no additional weight. As described above, the other equal influence factors were scaled to the Transaction risk's 99th percentile. As described earlier, the Bank recognizes that an aspect of Product risk is captured in this risk component; however, the Bank did not also reduce Transaction risk to reflect its shared risk because it recognizes that even though the risk is shared between the components, the behavior aspect of Transaction is part of the BSA/AML customer risk dimension and reduction in Transaction below equal influence would dilute this important aspect of customer risk.

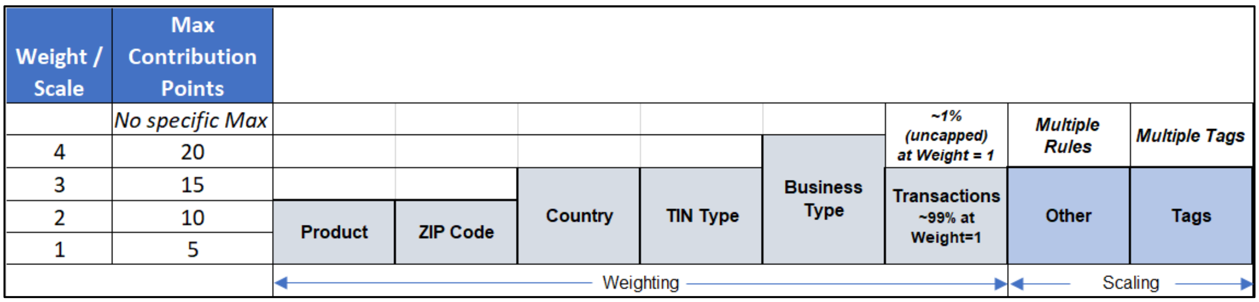
3.

Manual Scaling

In addition to the above risk components, RBRR supports two additional risk components - Other risk and Tag risk. To align the generated risk points from these components with the weighted risk components, specific factors are generally first rated on the 5-point risk scale described above then manually scaled by the above described scaling factor of 3 to arrive at the final risk points. If multiple rules are satisfied or multiple pointed tags are present on an account, then the points from each are added to arrive at the total points for that component of risk. These two components of risk along with any exceptions to the general scaling by 3 principle described here are covered in detail in the sections on "Add-on Points" later in this document.

Weighting and Scaling Relative Influence

While the relative influence of the weighted risk components ("Assigned Points") and scaled risk components ("Add-on Points") will vary on any one account, the chart below shows the relative
4. influence, or contribution, in the case where each component has been assigned its highest risk:



Note that in practicality, there will be a maximum number of points for Transactions, Other, and Tags; however, unlike the 6 weighted factors whose points are strictly limited by the structure of the model, these items are limited only by the value, volume, and variety of transaction activity and the number of implemented rules and defined tags. Note, the above is a simplified view that does not include scaling exceptions in the Other and Tag components, which are covered in detail later in this document.

The remainder of this section describes the above weighted risk components, and the subsequent
5. section describes the Add-on Points of the Other and Tags risk components.

"Product" Tab/Risk Component

The Bank offers a variety of products and services that are grouped into seven distinct product groups. In addition, each account is assigned an account type at opening. Each account type only supports certain products and services within the Bank's product group structure, and this relationship is shown below:

Account Type	Account Type Description	Product Group	Products
BOX	Safe Deposit Box[12]	n/a	n/a
COD	Certificate of Deposit	Certificates	Multiple

Account Type	Account Type Description	Product Group	Products
DDA	Demand Deposit Account	Consumer Checking	Multiple
DDA	Demand Deposit Account	Business Checking	Multiple
DDA	Demand Deposit Account	Savings/MM	Multiple
DDA	Demand Deposit Account	Internal	1
LCI	Commercial & Industrial and Commercial Real Estate Loans	Loans	Multiple
LAR	Commercial and Industrial -- Account Receivable	Loans	1
LLC	Commercial & Industrial Letter of Credit	Loans	1
LPD	Commercial & Industrial Pre-Delivery Payment Loan	Loans	1
LRC	Commercial & Industrial Revolving Credit Facility	Loans	1
LTL	Commercial & Industrial Term Loan	Loans	1
LCRE	Commercial Real Estate Loan	Loans	1
LNL	Line of Credit	Loans	Multiple
LOL	Deposit Secured Loan ("Sure Loan")	Loans	Multiple
LRL	Residential Loan and Upstart Loan	Loans	Multiple
SAV	Savings/Money Market	Savings/MM	Multiple

Risk levels vary among these account types and product groups. For example, accounts with a lower frequency of transactions such as CDs generally pose a lower risk than most demand deposit accounts ("DDAs") which exhibit more diverse and frequent activity. Furthermore, the risk levels of products within the same product group can also vary (e.g., the risk level of a regular checking account would be higher than that of a money market checking account due to the transactional limits placed on money market accounts ("MMs")).

To risk rate its products, the Bank has generally taken an account type / product group level risk rating approach but has, where necessary and as described below, made some exceptions to this higher level risk rating approach and risk-rated specific products themselves to better account for the particular risk presented by each product.

As implemented in RBRR, product risk rating assignment occurs at the product level (or, when not applicable such as for BOX account types, at the account type level). For each new product, FCC personnel following the rating methodology described in this document to confirm whether a new product presents similar risks as an already-rated product group. If so, that product group's rating is applied to the specific product. If not, then the deviation in risk is documented herein and the product is rated accordingly.

To establish the risk of existing products and evaluate the risks of new products, the Bank considers several factors that are critical to establishing the risk posed by the product. These factors include:

- Whether the product affords a degree of anonymity
- Product complexity (e.g., A commercial and industrial loan would generally be more complex than a simple CD due to the loan terms, type(s) of collateral involved, and potentially the number of parties involved.)
- Whether the product is typically or frequently involved with cross-border activities (e.g., some commercial and industrial loans involve or support trade-related activities.)
- Degree of liquidity that the product provides (e.g., compare/contrast a typical loan product tied to illiquid property vs. a typical DDA transaction profile)
- FFIEC guidance and regulatory environment related to the product
- Relative risk of the product to other products for which a risk level has already been established through qualitative evaluation using the above factors

The Bank recognizes that regulatory guidance denotes as higher risk some products and services that are aligned to channels or capabilities through which a customer may transact across several of the Bank's products. For example, a CD may cash out using an international wire – however, most CDs would not cash out in this manner since the Bank, in general, has relatively few international wires. Rather than capture this risk in the Product factor, the Bank captures this aspect of product risk in a more focused manner through the separate Transaction risk factor, which measures the degree of usage of these services, or capabilities, on its various products and assigns risk points accordingly.

Given the above, the Bank has assigned the following risk points to each Product Group:

Product Group(s) (Account Type)	Product-specific Rating or Rationale Exceptions	Risk Rationale	Risk Points Assigned
Certificate of Deposit (COD)	n/a	The Bank generally considers Certificate of Deposits (CDs) to be inherently lower risk due to the more limited liquidity offered through the terms of this product as compared to, for example, a DDA account. However, it recognizes that CDs have the ability to receive or disburse significant amounts of funds. In addition, through early payouts, bad actors who may be less averse to penalties can utilize CDs for placement or layering on	2

Product Group(s) (Account Type)	Product-specific Rating or Rationale Exceptions	Risk Rationale	Risk Points Assigned
		timescales that are shorter than the CD-defined terms. The Bank thus considers CDs to have elevated risk.	
Business Checking (DDA) Consumer Checking (DDA)	n/a	Consumer and Business Checking accounts are characterized by relatively high transaction volumes – including higher risk cash and electronic funds transfers (EFTs) – as compared to other products. Unlike Savings or CD accounts, Checking DDA accounts do not have limits on the number of transactions that may be conducted in a month, which may provide a preferred avenue for higher frequency movement of illicit funds or co-mingling of illicit activity with legitimate activity. Given the inherent highly liquid nature of these accounts, the Bank considers DDA checking accounts to be high risk.	4
Internal (DDA)	n/a	The Bank has a limited number of internal accounts (i.e., 8 as of 9/30/2019), which are assigned the Bank's EIN. As these are the Bank's own accounts, they have been assigned no risk points.	0
Savings (SAV) Money Market (DDA)	n/a	Savings and Money Market accounts, while generally liquid and supporting a wide variety of activity – including higher risk cash and EFT's - do have limits on the number of transactions per month. As a result, the Bank considers these products to have moderate risk. Note: Money Market accounts are a subset of products within the DDA account type, but their product features/constraints are more closely aligned to that of Savings account products, so their risk has been aligned similarly.	2
Savings (SAV)	Lease Security Accounts	Lease Security accounts are a type of Savings account that are controlled by the lessor in a lessor / lessee relationship but are named for and carry the demographics of the lessee and are used to hold lease deposits. Due to the limited transactional	1

Product Group(s) (Account Type)	Product-specific Rating or Rationale Exceptions	Risk Rationale	Risk Points Assigned
		nature and purpose of these accounts, the Bank considers them to have an inherently lower risk than other Savings products. These accounts are controlled and reviewed at the back-office level, and the back office must review transactions for these accounts as well as monitor the closures of such accounts. As a result, the Bank has rated these accounts low risk.	
Safe Deposit Boxes (BOX)	n/a	Given the non-transactional nature of Safe Deposit boxes, the Bank considers safe deposit boxes to be inherently low risk; however the Bank recognizes that these accounts could facilitate the temporary storage of cash related to illicit activities so has rated them as low risk.	1
Loans (LAR)	n/a	The Bank's LAR account type denotes Commercial and Industrial (C&I) department purchases of accounts receivable originating in the secondary market. As such, and given that these transactions do not involve an ongoing extension of credit to the Obligor or commitment to buy future accounts receivable from the Seller, the Bank does not view these transactions as involving Bank customers. Consequently, the Bank has rated these types of transactions as low risk.	0
Loans (LLC)	n/a	The Bank's LLC account type denotes letters of credit. Although the Bank only acts as a Confirming or Discounting Bank in such transactions (as opposed to an Issuing Bank), nevertheless, given the frequent utilization of letters of credit in trade finance transactions and the elevated money laundering / terrorist risk presented by such transactions, the Bank has rated these types of transactions as high risk.	4
Loans (LPD)	n/a	The Bank's LPD account type denotes pre-delivery payment loans, which involve progress payments purchasers make to manufacturers while new aircraft are being	3

Product Group(s) (Account Type)	Product-specific Rating or Rationale Exceptions	Risk Rationale	Risk Points Assigned
		built. Given that these loans frequently involve foreign Borrowers and can involve transfers of significant amounts of value (>>$10M) and relatively short loan terms (e.g., a year and a half), the Bank has rated these types of transactions as moderate risk.	
Loans (LRC)	n/a	The Bank's LRC account type denotes revolving credit facilities, which are committed loan facilities that allow Borrowers to borrow (up to a certain limit), repay, and re-borrow loans. Given that these loans can involve foreign Borrowers and transfers of significant amounts of value (>>$10M) and varied loan terms, the Bank has rated these types of transactions as moderate risk.	3
Loans (LTL)	n/a	The Bank's LTL account type denotes term loans, which are loans that are repaid in regular payments over a set period of time. Given that these loans can involve foreign Borrowers and transfers of significant amounts of value (>>$10M) and varied loan terms, the Bank has rated these types of transactions as moderate risk.	3
Loans (LCRE)	n/a	When real estate loans are paid down over their full term, which may be up to 30 years, they generally provide an inefficient means to launder significant amounts of illicit funds except as part of the integration phase of money laundering. However, through accelerated payments and early payoffs, large amounts of illicit funds can be converted into legitimate liquid assets on timescales considerably shorter than loan terms, which can make them attractive during the placement and layering phases. However, atypical payment frequencies or amounts will generally raise the account risk via the Transactions risk factor. In addition, very new accounts or customers will already receive extra risk points through the other	2

Product Group(s) (Account Type)	Product-specific Rating or Rationale Exceptions	Risk Rationale	Risk Points Assigned
		risk factors in the model that measure customer and account tenure.	
Loans (LRL)	n/a	It is important to note that the LRL account type consists of legacy residential loans and personal loans offered through Upstart. The Bank no longer accepts new residential loans with the most recent account open date within its residential loan portfolio being in 2015. As a result, the Bank's entire residential loan portfolio is held by well-established customers. There is elevated risk with loan products, namely at account opening, which is the timeframe that generally involves large fund amount movements. Given that no new residential loans will be opened, this particular risk is not present; however, there is an elevated risk present due to the nature of a loan product related to the ability for pay-off at different time scales. Personal loans offered through Upstart have been active since February 2021. The personal loans are offered only to NY residents, have a maximum loan amount of $50,000, and can obtained no more than twice in a year's time. The associated loan accounts are non-transactional accounts; however, as with other loan products, there is an elevated risk given the larger amount of funds passing through an account at account opening. Additionally, loan products can present an elevated financial crime risk with regards to pay-off at different, usually shorter, timescales. There is also an additional risk with any new product offering; however, the Bank believes that this is offset by the additional risk points given to any new account openings within the "Other" Risk Category/Attribute. Given the small loan size (e.g., no more than $50k), intended customer audience (e.g., consumer customers), and geographic location (e.g., within the Bank's regional footprint), the	2

Product Group(s) (Account Type)	Product-specific Rating or Rationale Exceptions	Risk Rationale	Risk Points Assigned
		Bank has elected to treat these loans as moderate risk.	
Loans (LCI)	n/a	Currently, accounts that have the LCI code consist of both Commercial Real Estate Loans (see LCRE discussion above) and Commercial & Industrial (C&I) loans. Commercial and Industrial (C&I) loans are used to fund a variety of a business customer's activities, and some C&I loans can involve transfer of significant amounts of value (>>$10M). In addition, C&I loans may be acquired using various types of collateral including business cash flows. Structurally, they are one of the more complex products the Bank offers, and some C&I loans can be used to fund cross border business activity. Given their complexity and potential exposure to trade finance-related activities, the Bank has rated these types of loans as moderate risk.	3
Loans (LNL)	HELOCs	The Bank's line of credit (LOC) account type includes real estate-secured LOCs in the form of Home Equity LOCs (HELOCs). Given a similar profile to its real estate loans – i.e., generally a large amount of funds provided upfront, collateralized via real estate, paid down over a period of time with the potential for accelerated payments or payoff as an avenue for introducing illicit funds into the system on shorter timescales – the Bank views HELOCs as presenting a similar risk as its real estate loan portfolio and has also rated their risk as elevated.	2
Loans (LNL)	Other LOCs	The Bank's other types of LOCs include both unsecured overdraft LOCs as well as deposit-secured LOCs through its SureLine product. As these do not require collateralization with a physical asset such as real estate, the barrier to usage is less than that required for real estate loans or HELOCs. However, as the increased liquidity provided by these LOCs is offset by the fact that they are also generally	2

Product Group(s) (Account Type)	Product-specific Rating or Rationale Exceptions	Risk Rationale	Risk Points Assigned
		significantly smaller in size than real estate-secured credit, the Bank has rated their risk as elevated.	
Deposit-secured Loans (LOL)	n/a	Deposit-secured loans provide credit to customers using those customer's funds in a CD or Savings account as collateral. Also known within industry as cash-secured loans, these types of loans have been identified in regulatory guidance as having higher risk due to their potential use of cash deposited in another account as collateral. However, the Bank's deposit-secured portfolio has an average balance of less than $3000 and only 5% of all deposit-secured loans have a balance of $12,000 or more (as of March 2020). As such, they generally are not a significant mechanism for transferring large amounts of funds, and those few that would have larger amounts would be expected to have their abnormal activity captured through the Transaction risk component. The Bank has rated the risk of its deposit-secured loan portfolio as elevated.	2

6.

"ZIP Code" Tab/Risk Component

The Bank also assigns risk points to a customer account according to the ZIP code associated with the account. Within RBRR, the ZIP codes have been enriched with city, state, and county/parish. In addition, the description field indicates intersection with High Intensity Financial Crime Areas ("HIFCAs") and/or High Intensity Drug Trafficking Areas ("HIDTAs"). [13] Through the RBRR user interface, the Bank can also use the "ZIP Code" tab to differentiate points between "local" and "non-local" status. The Bank will use the County/Parish where a branch is located to determine whether a county/parish qualifies as local or non-local, which in turn will either reduce (if local) or increase (if non-local) the overall point score for the ZIP code in question.

Using the above information, the Bank has identified the following geographical categorizations as impactful to its ZIP code risk. It is possible for a given ZIP code to intersect more than one of these categories:

1. **Local / Non-Local –** Whether the ZIP code intersects a county in which the Bank has a branch footprint. Accounts with addresses within the branch footprint are generally considered to have less geographic risk than those outside the branch footprint where in person interaction with the Bank may be less and/or there is not a geographic convenience reason to conduct business with the Bank. The current branch footprint may be found on the Apple Bank website at https://www.applebank.com/about/get-in-touch/locations-directions and as of May 2020 included the following counties:
    - New York (Manhattan)
    - Kings (Brooklyn)
    - Richmond (Staten Island)
    - Bronx
    - Queens
    - Westchester
    - Suffolk
    - Nassau
2. **High Intensity Drug Trafficking Area ("HIDTA")** – The HIDTA program is a drug-prohibition enforcement program run by the USA Office of National Drug Control Policy. A HIDTA identifies a geographic location, usually a major metropolitan area, county, or border processing, in which the program has designated as major drug trafficking zones. Given this designation, the Bank considers ZIP codes that intersect HIDTAs to generally have more risk than those that do not.
3. **High Intensity Financial Crime Area ("HIFCA")** – The HIFCA program is intended to concentrate law enforcement efforts in high-intensity money laundering zones. Given this designation, the Bank considers ZIP codes that intersect HIFCAs to generally have more risk than those that do not.
4. **US Territories** – The Bank considers ZIP codes associated with US territories to generally carry more risk than ZIP codes within the 50 US states due to location and greater potential for nexus with foreign financial activity. The geographies within this category include:
    - American Samoa.
    - Guam
    - Northern Mariana Islands
    - Puerto Rico
    - US Virgin Islands

5. **Military** – This category includes all military addresses. The Bank considers ZIP codes associated with military address to generally carry more risk than ZIP codes within the 50 US states due to military addresses having no definite physical location

associated with them and the potential for nexus with foreign financial activity while service members are on deployment. The geographies within this category include:

- DPO – All Regions
- APO – All regions
- FPO – All regions

Given the above categories, and the Bank's view of risk posed by each, the following chart identifies the Assigned Points for the ZIP codes associated with the expected combinations of the above categories:

Local	Non-Local US State	Non-Local US Territory	Military	Missing	Risk Points
Neither HIDTA *nor* HIFCA					0
HIDTA *or* HIFCA					1
HIDTA *and* HIFCA	*Neither* HIDTA *nor* HIFCA				2
	HIDTA *or* HIFCA	*Neither* HIDTA *nor* HIFCA			3
	HIDTA *and* HIFCA	HIDTA *or* HIFCA			4
		HIDTA *and* HIFCA	All	Any	5

Note, that to avoid double counting risk, the bank treats ZIP Code and Country risks as mutually exclusive from a risk pointing standpoint – i.e., domestic accounts, including US territories, receive ZIP Code risk only whereas foreign accounts receive country risk only. Country- rather than ZIP
7. Code-based risk rating is consistent with industry practice for risk rating non-US countries.

"Country" Tab (attribute/category)

The Bank evaluates the specific risks associated with doing business in, opening accounts for customers from, and/or facilitating transactions involving certain geographic locations. The Bank uses the IBM Financial Crimes Geographic Risk Insight list, which is published three times a year, as a guide to determine country risk ratings within RBRR. Additional information on the rating methodology for this list may be found in the "IBM Financial Crimes Geographic Risk Insight *mm.dd.yy* Methodology" that is delivered with each list update and stored for reference on the FCC share drive at S:\Governance\Jurisdiction_Risk_List with *mm.dd.yy* corresponding to the specific list release date. The rating as of May 2020 considers the following jurisdiction exposure risk factors when calculating country risk:

1. Jurisdictions subject to sanctions by the U.S. Department of the Treasury OFAC (Office of Foreign Assets Control), European Union, and United Nations

2. Jurisdictions identified as Primary Money Laundering Concerns by the U.S. Department of the Treasury under Section 311 of the USA PATRIOT ACT
3. FinCEN Advisories including those jurisdictions identified as representing a money laundering threat
4. State sponsors of Terrorism as identified by the U.S. Department of State
5. Major Drug Transit or Producing Countries identified by the President of the United States through the Department of State
6. Tax havens and offshore financial centers as identified in the Annual Tax Transparency Report published by the OECD
7. Non-Cooperative Tax Jurisdictions as identified by the European Commission Platform for Tax Good Governance
8. Major Money Laundering Countries as identified by the U.S. Department of State in the annual International Narcotics Control Strategy Report (INCSR)
9. Jurisdiction's standing on the Corruption Perceptions Index as published by Transparency International
10. Worldwide Governance Indicator on Control of Corruption as determined by the World Bank

In addition to the above exposures, the jurisdiction risk rating as of May 2020 considers quality of risk management in each jurisdiction as indicated by the following:

1. Worldwide Governance Indicators on Regulatory Quality and Rule of Law as determined by the World Bank
2. FATF statements including jurisdictions identified by FATF as having inadequate AML/CFT controls in place
3. Assessment of jurisdictional compliance with international standards on combatting money laundering and the financing of terrorism and proliferation through Mutual Evaluation Reports published by FATF and FATF-Style Regional Bodies.

The following table provides the mapping between the published risk list and the risk points applied within RBRR:

Published Risk Score	Risk Rating	RBRR Risk Points
6 and above	High	5
3 – 5.99	Medium	3
0 – 2.99	Low	1

Note that the bank treats ZIP Code and Country risks as mutually exclusive from a risk pointing standpoint – i.e., domestic accounts receive ZIP Code risk points whereas foreign accounts receive country risk points. As a result, the U.S. jurisdiction receives 0 risk points rather than 1 risk point as per the table above.

With each new rating distribution, the Bank reviews the list, compares it to current jurisdiction ratings, considers impact and exposure relevance of the changes to its business, and makes any necessary adjustments through the established change management process for RBRR.

"TIN Code" Tab/Risk Component

The Bank recognizes that type and status of a customer's taxpayer identification number ("TIN") is a factor in assessing a customer's overall risk rating as it can provide indication of the level of certainty that the Bank has about the customer's identity as well as the degree of international exposure the
8. customer presents. Each tax id has associated with it a TIN Code attribute that indicates the type and status of the tax id. The Bank has established the following TIN Codes in RBRR, and rated them as shown:

TIN Type	Status / Sub-Category	Description / Rating Rationale	TIN Code[14]	Risk Points
Individual Tax Ids				
Social Security Number ("SSN")	Certified	This sub-category consists of accounts for customers whose SSNs have been certified through an executed IRS Form W-9 (Request for Taxpayer Identification Number and Certification) ("W-9"). The Bank has assigned no risk points to this TIN status, as the Bank validates customer SSNs via both documentary and non-documentary sources at the time of account opening and as such sees no risk to the Bank posed by these customers. Note: NRA-tagged accounts where the NRA is the joint and not the primary holder can receive this TIN Type, also.	0	0
Social Security Number ("SSN")	Non-certified	This sub-category consists of accounts for customers whose SSN has not been certified by the execution of a W-9. Given the lack of certification the Bank considers these customers to pose a higher risk to the Bank.	2	5
Individual Tax Identification Number ("ITIN")	Certified	This sub-category consists of accounts for customers whose ITIN has been certified through an executed W-9. Given that those who would get an ITIN from the IRS are not eligible for an SSN and can include both resident and non-resident aliens ("NRAs"), the Bank considers these customers to pose a higher risk to the Bank.	4	5
Individual Tax Identification Number ("ITIN")	Non-certified NRA	Although this situation is rare, this status is assigned to customers in situations where their NRA status has lapsed at the end of a three-	5	5

[14] McCracken-sourced accounts use TIN code of "SSN" and "EIN", which are equivalent to and rated in the same manner as TIN Code of "0" and "1", respectively.

TIN Type	Status / Sub-Category	Description / Rating Rationale	TIN Code[14]	Risk Points
		year period and has not yet been re-validated by the Bank. To account for this risk, the Bank assigns the highest risk to this status and additionally freezes the account until the customer's status is re-validated.		
Entity / Business Tax Ids				
Employer Identification Number ("EIN")	Certified	This sub-category consists of accounts for customers whose EIN have been certified through an executed W-9. The Bank has assigned no risk points to this status as the Bank validates customer EINs via both documentary and non-documentary sources at the time of account opening and as such sees no risk to the Bank posed by these customers.	1	0
Employer Identification Number ("EIN")	Non-certified	This sub-category consists of accounts for customers whose EIN has not been certified by the execution of a W-9. Given the lack of certification, the Bank considers these customers to pose a higher risk to the Bank.	3	5
Employer Identification Number ("EIN")	Certified Tax Exempt	This sub-category consists of accounts for customers that are certified 501(c)(3) tax-exempt entities. The Bank has assigned no risk points to this status since it has addressed the risk posed by this customer type (e.g., NGOs) via the Business Type risk factor.	9	0
Employer Identification Number ("EIN")	Non-certified Tax Exempt	This sub-category consists of accounts for 501(c)(3) tax-exempt customers whose EIN has not been certified by the execution of a W-9. Given the lack of certification, the Bank considers these customers to pose a higher risk to the Bank. Note that, in general, this code should not be used to classify an account's TIN Type; however, it may occasionally appear on an account before it is corrected.	8	5
Missing/Pending Tax Ids				
No Tax Id	W8-BEN E or No TIN	This sub-category consists of accounts for foreign customers who file IRS Form W-8BEN (Certificate of Foreign Status of Beneficial Owner for United States Tax Withholding and Reporting (Individuals)) ("W-8BEN"). Additionally, this sub-category includes uncertified W-8BENs and missing TINs. Given this groups involves foreign customers as well as those without any TIN, the Bank considers these customers to present a higher risk than those who have certified SSNs or EINs.	6	5

TIN Type	Status / Sub-Category	Description / Rating Rationale	TIN Code[14]	Risk Points
No Tax Id	Tax Id Applied for	This sub-category consists of accounts for customers who have applied for a Tax ID. Although this situation is rare, this status is assigned to customers in situations where they have applied for a Tax ID but have not yet received it, and as such the Bank considers these customers higher risk given that proof of a tax id has not yet been provided. If proof of tax id is not supplied in a timely manner, the customer relationship will be closed. Note that, in general, this code should not be used to classify an account's TIN Type; however, it may occasionally appear on an account before it is corrected.	7	5

9. "Business Type" Tab/Risk Component

The Bank recognizes that a customer's business type is a factor in assessing a customer's overall risk rating. The Bank's business types are aligned to the 2012 North American Industry Classification System ("NAICS") encoding as loaded in RBRR. [15] The NAICS encoding scheme is arranged in a hierarchy consisting of 2 to 6 digits that indicate the nature of the categorized business from the sector level (2 digits – e.g., 23 = Construction) all the way down to the specific type of business (6 digits – e.g., 236118 – Residential Remodelers). Only the business type level (6 digit) NAICS codes are used within RBRR itself. Sector level codes are used in the methodology to establish a baseline rating for the sector against which individual business types are either aligned or excepted as described subsequently.

The Bank has generally taken a sector-based approach to its risk rating by identifying what are the key risks common to each sector. However, in addition to evaluation at the sector level, the Bank evaluates each business type that is associated with its active accounts to confirm that the business type's specific risks align with the identified sector risk. Where the sector risk and the business type risk align, the business type is given the Bank-determined sector risk. Where they do not align, the Bank has made further business type-specific risk factor recognition and corresponding points adjustments to better

[15] Abrigo utilizes the 2012 NAICS Business Code list in its translation table because FinCEN only allows these codes in its reporting forms that financial institutions use to submit SARs.

account for the risk involved based on regulatory guidance, industry best practice, and the Bank's own risk evaluation of that specific business type.

When evaluating the risk presented by a given sector or business type, the Bank first eliminates the business types (or business type sub-populations) that appear on the "Apple Bank Prohibited Accounts" list. Since the Bank will not do business with business types on this list, their risk is effectively removed from Bank's account risk exposure in that sector or business type – e.g., by policy, the Bank does not do business with cryptocurrency mining businesses that may exist within NAICS code 518210 (Data Processing, Hosting, and Related Services) so the 518210 business type risk within the model does not need to capture the risks posed by these types of businesses as there will be no accounts that carry this risk.

When evaluating the risk for the sector or the business type, the Bank considers the applicability of various regulatory-recognized risk factors, or exposures, for that sector or business – including:

- Cash intensive
- Cross-border exposure
- Gatekeeper (e.g., lawyer or accountant)
- High value / luxury goods
- Non-governmental organization ("NGO")
- Non-Bank Financial Institution ("NBFI")
- Terrorism
- Fraud/corruption

The Bank has given each of the business type risk factors a weight based on its qualitative evaluation of the relative importance of that factor along the scale of 0 – 5. (e.g., "NGO" is 5 points (Very High Risk) while Cash Intensive is 4 points (High Risk) and Cross-border is 3 points (Moderate Risk)).

For each sector and business type, the various factors are evaluated in the form of a series of questions to which a Yes or No ("Y" or "N") response is provided. The overall risk for the sector or business type is determined by identifying the maximum risk points across all risk factors for which a positive response (i.e., risk is present) is given then for each additional risk beyond the first risk, a point is added to the previously determined maximum value.

For example, say a business type is cash intensive (4 points) and, also, has a degree of cross-border exposure (3 points). In this case, the maximum of the factors is 4 points, but, since there is an additional risk factor beyond the first factor, 1 point is added to the maximum risk to give a total of 5 risk points for that business type. If this rating approach yields a total score greater than 5 points, the business type's risk points are set to the risk points' ceiling of 5 points. Finally, the previously described RBRR business type's risk factor weighting is applied to determine the business type's contribution to the overall account risk score.

The business type risk rating process and assigned business type risk factor weights are managed within the "Business Type Risk Rating" worksheet that captures the responses to each risk question and calculates the total risk points for the sector or business type. [16] In addition, within this worksheet, a qualitative review of each sector is documented along with relevant reference material that has been used as guidance. Additional instructions regarding the usage of the worksheet for rating purposes are included in the worksheet itself.

If a new code is encountered during the RBRR "Refresh Codes" process (described later in this document), the Bank will add the code to the worksheet, determine whether or not the sector rating applies to the new code, and, if not, answer the series of risk factor questions about that new business type. Once the risk points are determined, the Bank will proceed to assign the points within RBRR before performing the risk rating run. Please see the section on Configuration Changes later in this document for details on how this type of change is handled within the model.

Should an invalid NAICS code arrive from the source, the Bank will work with the source system owner to correct the issue such that only valid NAICS codes are sent in to RBRR.

The following NAICS codes receive special handling:

<table>
<tr><th>NAICS Code</th><th>Description</th><th>Risk Pointss</th><th>Handling/Rationale</th></tr>
<tr><td>522120</td><td>Savings Institutions</td><td>0</td><td>The business type risk-rating methodology for this code would normally be 4 points, however the Bank does not bank other institutions so the only accounts that are assigned this NAICS code are all Apple Bank-owned accounts, which do not present a customer risk to the Bank.</td></tr>
<tr><td>525920</td><td>Trusts, Estates, and Agency Accounts</td><td>n/a</td><td>The Bank's portfolio includes a variety of trust types including both business and individual trusts along with more specialized trust types. Based on the differences in the nature of the trusts, they do not all pose the same level of risk to the Bank, therefore the single Trust NAICS code does not provide the necessary granularity to risk rate these appropriately so no accounts will be assigned this NAICS code as of first quarter of 2020. Rather, the Bank has used account tagging, as described later in this document, to quantify its risk exposure presented by the following types of trusts.
<table>
<tr><th>Trust Type</th><th>Assigned Tag</th></tr>
<tr><td>Business</td><td>TRUST</td></tr>
<tr><td>Individual</td><td>INTR</td></tr>
<tr><td>Pension</td><td>Pen</td></tr>
<tr><td>Testamentary</td><td>Tesa</td></tr>
</table>
</td></tr>
</table>

[16] Note: the "live" version of the Business Type Risk Rating worksheet is stored with other procedure documentation on the BSA_SHARED drive within the "FCC BSA-AML ADVISORY" folder.

NAICS Code	Description	Risk Pointss	Handling/Rationale
			Pre-Need | Pren Please see the section on Tagging later in this document for points assignments and additional information on Trusts.
Multiple	Businesses of any type that are home-based	Per NAICS code	Businesses that are home-based, which may cover a variety of NAICS codes receive additional points beyond the points received through the Business Type risk component due to their unique nature. Home-based Businesses are explained in greater detail in the section on Tags later in this document.

"Transactions" Tab/Risk Component

As described in the Product section above, there are seven distinct Product Groups in RBRR. The Bank has assigned various points based on the dollar amount and frequency of the Bank's customers' transaction activities for five of these seven distinct Product Groups, as follows: [17]

10.

Product Group/ Description	Assigned Points for Dollar Thresholds	Assigned Points for Frequency Thresholds
Consumer Checking	Yes	Yes
Business Checking	Yes	Yes
Savings/MM	Yes	Yes
Certificates	Yes	Yes
Loans	Yes	Yes
Internal	N/A	N/A
Safe Deposit Box	N/A	N/A

Because an account may have multiple types of transactional activity and that activity can be risk rated on a value as well as volume basis, the total possible risk score that could be generated from the transaction component has potential to have an outsized influence on the overall risk score, which would be counter to the Bank's balanced approach to its risk model as well as be a potential source of instability in the model. Because of this, the Bank has limited the transaction risk points contribution during final risk score calculation at 15 points, which corresponds to the highest risk (i.e., 5 unweighted points) associated with its equal influence risk factors that receive a weight factor of 3. (e.g., highest risk TIN types or highest risk countries). This point limiting, or capping, is performed as post-risk rating processing outside of RBRR. The Bank also recognizes that capping has potential to eliminate some inherently higher risk accounts from review and uses the model's auto-high capability as a mitigant for this. Transaction capping and auto-high are features that are implemented in RBRR post-processing, whose configuration is addressed in more detail later in this document as well as earlier in this document in the Model Design and Risk Component Weighting sections.

a) Transaction Threshold Setting

Transaction risk point thresholds have been set based on quantitative analysis of the transaction data using the Abrigo Statistical Management Reports (SMRs) and were last tuned by Abrigo in the first quarter of 2019, the details of which are covered in the deliverables from that effort. The SMRs provide transactional activity analytics whereby one can determine activity distribution of specific transaction types (e.g., Cash, International Wire, etc.) using a variety of filter criteria to focus on the sub-populations of interest. Through SMRs one can determine what is normal vs unusual activity based on standard deviations and can set thresholds using this insight.

[17] The seventh distinct Product Group "Internal" is comprised of 8 custodial accounts that Apple utilizes for internal purposes.

This SMR-driven tuning process is described via the steps below:

1. Execute the SMR for the account product group of interest with the following filtering set:

    a. Last 3 months
    b. Exclude Closed Accounts

    Note that even though this is an activity-based analysis, accounts with no activity are included in the SMR results, which will cause this process to yield more conservative values than if only accounts with activity were analyzed.

    Also note that the SMR reporting process does not have an outlier removal mechanism such that all activity will be included in the analysis.

    c. Include only accounts having activity of the given type in the analysis

    The Bank has observed that without this filter – particularly in sub-populations of accounts where a large number of accounts are not be regularly transacting in the given transaction type - the SMRs can produce average values that are quite low such that the resulting thresholds as described in subsequent steps may be set in such a way that any account that transacts may get risk points, which, while certainly a conservative approach, isn't consistent with the Bank's view of activity risk.

2. For the transaction types for which thresholds are to be set, identify the 1st Standard Deviation ("1st StdDev") above average from the SMR report.
3. The 1st StdDev forms both the notional "floor" for the first threshold as well as the guide for how far apart the additional (higher) thresholds should be set. (i.e., the threshold for 1 risk point)
    a. Since more activity generally implies more risk involved, the risk points increase with the number of standard deviations away from and above the average.
4. Using a common sense, risk-based approach this initial quantitatively derived value may be further adjusted based on the following representative factors:
    a. Raising or lowering the threshold based on the Bank's own understanding of risk and reasonability
    b. Rounding to the nearest hundred or thousand for simplicity/ease of use
5. Set the remaining thresholds beyond the 1st StdDev via this Standard Deviation-based approach (e.g. 2 risk points to the range derived from the 2nd StdDev above average, 3 risk points to the range derived from the 3rd StdDev above average, etc.) with further adjustments, as necessary, as described in #4.
6. For each threshold / range that is set, document the decision-making that occurred to transform the value(s) from the SMR into the final setting, which should include the following relevant items – preferably in tabular form:

a. Date SMR executed and filtering applied
b. Account product group
c. Transaction Type
d. Indication of whether this is a count- and/or amount-based threshold
e. SMR-produced raw Standard Deviation implied range
    i. Note: The SMR only shows 4 StdDev's so the 5^{th} StdDev (5 risk point threshold) will have to be extrapolated.
f. Analysis/Rationale for any risk-based adjustments and/or reasonability adjustments to the implied ranges from the raw SMR report values
    i. Note: If further quantitative analysis is performed to assist with the decision-making, record of same should be preserved and associated with and/or embedded in the documentation.
g. Final ranges based on above analysis and adjustments
h. Risk points assigned to that range

Additional transaction threshold setting considerations follow:

- When defining the ranges, non-overlapping contiguity of the ranges should be maintained.
- Some transaction types do not have "Product Groups" assigned to them by default by Abrigo. These are "Wire International (Volume and Frequency)", "Monetary Instruments (Frequency)", "Monetary Instruments Cash In (Volume)", "ATM (Volume and Frequency)" and "ATM In (Frequency)." When setting ranges for these transactions, the SMRs should be reviewed across all account types.
- When overall volumes are low, risk-based decisions may be required to elevate the threshold values higher than those implied by a purely Standard Deviation-based analysis so that those few accounts that do transact do not have their transaction activity risk component automatically set to high risk. For example, this may happen with loan accounts. Again, as noted above, any such decisions should be documented.
    - Note: This affect can be mitigated to a considerable extent by using an SMR activity threshold filter as described above so that the low/no activity accounts are not considered for average and standard deviation determination purposes.
- The data used for the SMRs is based on the Customer Profile Report (CPR) whereas the data evaluated by RBRR is based on the account monthly summary table, which both reside within the BAM+ databases.

D. Add-on Points Contribution to Customer Risk Rating

In addition to the Assigned Point Totals in RBRR, the Bank considers certain unique customer account risk factors that are not factored into a customer's risk rating (e.g., foreign PEPs are a customer type that the Bank considers to be high-risk, but the risk cannot be captured in one of the core six risk factors). The Bank has established Add-on Points that are assigned to a customer account in the "Others" and "Tags" Tabs (attributes/categories) in RBRR.

1. "Others" Tab/Risk Component

The "Others" Tab (attribute/category) is used to assign additional points to a customer account when certain conditions are met. As described in the section on weighting earlier in this document, the default approach for this risk component is to risk rate each item on the 5-point risk scale then apply a scaling factor of 3 to arrive at the final score. This following risk factors are part of the Others risk component:

1. SAR Filing

The Bank has the capability to assign extra points to an account's risk score if a SAR had been filed. The Bank considers an account to carry the most SAR-related risk immediately after a SAR has been filed with a progressive diminishing of risk over time should additional SARs not be filed until the SAR-related risk returns to pre-SAR levels (i.e., 0 SAR risk points) During the first 120 days after a SAR has been filed, the account will be in the Bank's Supplemental Review (SSR) period for which another SAR must be filed by the 120th day should the activity be recurring or other suspicious activity has been observed. Given this timing, the Bank maintains the maximum SAR risk points until the end of the 120 days. If a new SAR is filed, then the risk will be maintained at its maximum level, however, if the activity does not recur and a continuing activity SAR is not filed, then the SAR risk reduces for the remainder of the year after the initial SAR filing at which point the SAR risk is removed from the account. This results in the following SAR risk points assignments:

"Others" Tab in RBRR (SAR Filing)		
# Days since SAR filing	**Initial Risk Points Setting**	**Scaled Assigned Add-on Points in RBRR**
0-120	3	9
121-365	1	3

2. Customer and Account Relationship Age

Because the Bank believes that new customers and accounts present a slightly greater AML risk due to the lack of relationship or behavior history to guide its risk evaluation, the Bank considers new customers to pose a slightly higher risk than new accounts and has designed its risk point structure to reduce over time as the relationships age. Since the Bank believes that these should not be major risk drivers but rather tie-breakers for risk level edge cases, the Bank has not performed any scaling on the risk points assigned. In addition, the Bank observed during risk weight adjustment that applying a multiplier to these factors caused significant swings in the risk tier populations due simply to new customers and accounts and their subsequent aging, which was inconsistent with its understanding of the actual risk impact posed by this population. The following table shows the current settings:

"Others" Tab in RBRR Customer and Account Aging		
Relationship	**Age**	**Risk Points**
Customer	0-180 days	2
Account	0-90 days	1

The above points structure works together when both the customer and the account relationship are new to create a 3-level points progression as the combined relationship ages, as follows:

Relationship	Age	Risk Points
New Customer and New Account	0-90 days	3
	91-180 days	2
	> 180 days	0

Finally, note that the Bank does not assign points to customer accounts that have been closed because the Bank recognizes there is little value in the ongoing risk rating of closed accounts.

2. "Tags" Tab/Risk Component

The "Tags" Tab (attribute/category) allows the Bank to assign additional risk points for other risk factors that are not captured in the six core, weighted RBRR risk factors in the Assigned Points portion of the model. Generally, the risk posed by certain high-risk business types, such as cash intensive businesses, non-governmental organizations, non-bank financial institutions, and professional service providers is captured via the NAICS code that is assigned in the Business Type Tab (e.g., the NAICS code "Offices of Lawyers," which is an example of a high risk professional service provider, receives 5 points in the Business Type Tab). However, in certain circumstances, a risk factor that cannot be captured through the NAICS code in the Business Type tab or one of the other core risk factors is needed to better capture the risk posed by a particular account. In these situations, Tags allow the Bank to identify and monitor these risk factors, including, but not limited to, Trusts, Home Based Businesses ("HBBs"), and Privately Owned ATMs ("POATMs"), which pose a higher risk of financial crime, require additional KYC due diligence requirements, and warrant additional oversight.

As with items within other tabs, tags that are used for risk-rating purposes are initially rated on a scale of 0 – 5, but their final point settings in RBRR are increased by a factor of 3 as a result of the re-scaling described in the Assigned Points section earlier in this document. Trusts are an exception to this scaling by 3. Since Business trusts are viewed as a business type, they are scaled to be consistent with the Business Type weight of 4.

Note that tags may also be utilized for non-risk related, internal recordkeeping or account categorization purposes, however, these are outside the realm of customer risk rating and receive no points. Tags that receive no points are not covered in this document as they have no influence on the account's risk rating.

The following chart lists the tags that the Bank actively utilizes for risk-rating purposes and their respective assigned Add-on points when present on the account along with the Bank's rationale for their rating:

Tag	Description	Initial Risk Points	Scale Factor	Scaled Risk Points	Rationale/Comments
314 (a)	Requests from Law Enforcement Agencies	3	3	9	While involvement in a law enforcement investigation does not automatically indicate that there is criminal activity on an account, the Bank recognizes that such association does raise an account's risk and has rated this association as a moderate risk factor.
DPEP	Domestic Politically Exposed Person	2	3	6	Susceptibility of a politically exposed account owner to bribery or corruption due to their position elevates the risk of the account.
FPEP	Foreign Politically Exposed Person	4	3	12	Susceptibility of a politically exposed account owner to bribery or corruption due to their position elevates the risk of the account. In addition, owners of these accounts present a foreign exposure that raises the account's risk beyond that of a domestic PEP such that the Bank has designated this a high-risk factor.
HBB	Home Based Business	2	3	6	Home-based businesses receive additional risk points beyond what may be assigned through the business type risk. Due to their presence within the account owner's home, they are not subject to the

Tag	Description	Initial Risk Points	Scale Factor	Scaled Risk Points	Rationale/Comments
					same site verification to which regular businesses are subject, so the Bank elevates their risk using a moderate risk factor to capture this uncertainty.
INTR	Individual Trust	4	3	12	The Bank considers individual trusts to be a high-risk factor due to their increased complexity and separation of legal structure from beneficial ownership, which can present transparency challenges that are not present with regular accounts. In addition, this trust does not have the limited purpose constraints that the medium risk trusts also covered in this section have on them, so they present a wider risk surface for potential exploitation for money laundering purposes.
NRA	NRA – Non-Resident Alien	1	3	3	Non-resident aliens present a foreign risk exposure which elevates the risk of the account. This tag is especially important for accounts which are jointly owned with a US citizen since, if the account's address is domestic, this is the primary means by which the foreign exposure is identified. For accounts that are not domestic, additional foreign exposure risk is captured in the country risk component.
PATM	Privately Owned ATMs	3	3	9	Privately owned ATMs present AML risk due to lack of visibility or controls into how the ATM is filled/re-filled with currency. In addition, private ATMs are often associated with cash-intensive businesses. As of December 2019, the Bank is no longer opening new accounts associated with businesses that are responsible

Tag	Description	Initial Risk Points	Scale Factor	Scaled Risk Points	Rationale/Comments
					for replenishing the cash in the ATMs but will continue to accept new accounts where a third-party is responsible for the cash replenishment function. The Bank considers private ATMs to be a moderate risk factor.
PEN	Pension Trusts	3	3	9	While trusts are generally a higher risk entity, the Bank views pension trusts as presenting less opportunity for money laundering abuse due to, for example, (typically) board or committee oversight of their operations, and a more conservative fiscal philosophy due to their need to generate a steady and predictable income stream. As a result, the Bank considers them to be a moderate risk factor as compared to the higher risk individual and business trusts.
PREN	Pre-Need Trust	3	3	9	Pre-need trusts are a limited purpose trust used to pay for future funeral and burial expenses. In addition, the amount of funds involved is generally relatively small – specifically, most of the pre-need trusts in the Bank's portfolio carried a balance of less than $10,000 and none carried balances greater than $25,000 as of May 2020. Due to their limited purpose and typically limited funding, the Bank considers these trusts to be a moderate risk factor as compared to higher risk individual and business trusts.
RDC	Remote Deposit Capture	1	3	3	Remote deposit capture capabilities on an account present an elevated risk for check fraud – e.g., via duplicate check deposit. In

Tag	Description	Initial Risk Points	Scale Factor	Scaled Risk Points	Rationale/Comments
					addition, this capability can remove the need for more frequent in person interaction with a branch.
TESA	Testamentary Trust	3	3	9	Testamentary trusts are used to manage the distribution of an estate's assets including, potentially, proceeds from a life insurance policy. Due to their limited purpose and conditions for use, the Bank considers these trusts to be a moderate risk factor as compared to higher risk individual and business trusts.
TRUST	Business Trust	4	4	16	The Bank considers business trusts to be a high-risk factor due to their increased complexity and separation of legal structure from beneficial ownership, which can present transparency challenges that are not present with regular accounts. In addition, this trust does not have the limited purpose constraints that the medium risk trusts also covered in this section have on them. Finally, this trust type has been scaled to be consistent with the business type which captures the higher risk (as compared to individual trusts) associated with these.

E. Administrative Tabs Impact on RBRR Processing

RBRR has three additional Tabs (attributes/categories) that provide administrative information but do not assign risk points to customer accounts.

“Settings” Tab

The Settings tab currently has 2 processing-critical parameters, as follows:

	Parameter	Value	Description
1.	**Model Transaction Data (Avg)**	3	# of months to average when computing amounts to evaluate against transaction thresholds. Note that generally this value should match the period used for SMR reports when evaluating transaction thresholds. Note: Auto-High post-processing also references this parameter for its evaluation period.
	Exclude Closed Accounts	Yes	Whether to exclude closed accounts from risk rating. See the Model Assumptions section for additional details on rationale for this setting.

2. ### “Rules” Tab

If RBRR were the only component within the model, the Rules tab would be where final risk thresholds are set. However, due to the need to have different risk thresholds for business and individual accounts, the Bank is unable to use the Rules tab within RBRR for setting its risk thresholds. These thresholds are maintained via a change request issued to the FCC Systems manager who can facilitate the
3. necessary update to the extension table containing this information outside of the RBRR application.

“Ratings History” Tab

The “Ratings History” Tab (attribute/category) in RBRR provides a historical view (i.e., date and time of the “refresh,” and requested by whom). The “refresh” is the Bank’s pre-risk rating receipt of any updates and/or changes to the customer accounts’ profile information since the prior risk rating, though there is no constraint that prevents the refresh from being performed multiple times between ratings runs should AML Advisory wish to observe in further in advance what new changes will need to be addressed before a ratings run..

F. RBRR Post-processing

There are currently 3 functions that occur outside of RBRR due to Bank-recognized limitations in that component of the model for which the Bank has developed mitigating solutions.

Segmentation

As covered in the section on Model Design, segmentation categorizes the account population into business and individual customer accounts. There are not currently any parameters for segmentation that are considered "configurable" (i.e., adjustable by the Bank without a code change). The Model Design section on segmentation identifies the rules applied within the segmentation component.

1. Transaction Capping

As described earlier in this document the model risk pointing has been scaled based on the (approximately) 99th percentile for transaction risk points, which occurs at around 14 risk points, with 15 points being the nearest points divisible by 5 – yielding a weight of 3 for other equal
2. influence factors. Since, based on analysis in August 2019, this still leaves around 3100 outliers above the 15-point level, capping has been implemented to ensure that no accounts have a transaction risk component that exceeds 15 points. This prevents transactional activity from dominating the overall risk score. By capping the transaction risk at 15 points, this effectively sets the highest scoring transaction risk to have an equivalent influence upon the overall risk score as that from other equal-weighted high risk factors such as the highest risk countries or TIN Types (5 pts x 3 weight = 15 pts). Additional details on capping may be found in the section on Model Design as well as in the section on Risk Component Weighting where the basis for the 15-point capping level is established.

3. Auto-High Processing

After the score-based risk tiers have been assigned to each account, a final post-processing step is performed as a means to expose to the high risk tier specific accounts that require attention but may not have otherwise reached the highest tier.

a) Threshold Setting

The Bank considered a number of factors when determining where to set its initial auto-high thresholds, which were validated via qualitative review as described in the qualitative review notes included in the Appendix. These included:

- Distribution of account activity for those accounts transacting in the given high-risk transaction type (e.g., Cash)
  - Given that many accounts do not have transactional activity in a high risk transaction type over the analysis period, considering just those accounts that do transact in the high risk activity type when computing averages, permitted the Bank to focus on just the sub-population of accounts and activity levels that presented risk.
  - The Bank found that normal and expected Commercial and Industrial loan activity would pull the averages for business international wire activity up, which could yield less conservative thresholds so it reviewed average international wire activity both with and without the influence of these accounts to gain a better understanding of where the outliers in the general population of accounts would reside.

    - While generally, the activity levels (by value) of interest were considered in the 2-3+ standard deviation range, the Bank conservatively also wanted levels that would generally identify at least some outlier accounts with the auto-high functionality even if this mean selection of values at lesser standard deviations from the average as was the case for both International Wire and IAT transactions.
- Whether the accounts at the given level were under scope of EDD review.
- Other controls that the Bank has in place to address activity-based unusual behavior such as TM and CTRs, which was an influencing factor when deciding to focus on those accounts exhibiting more than a single month of activity at the levels of interest.
- What activity levels the Bank would generally consider to be high risk behavior if given no other context about the account.

Based on consideration of risk involved as well as review of quarterly averages and consideration of other controls such as transaction monitoring and CTRs, the Bank established initial auto-high thresholds for which it performed a more detailed qualitative review exercise to confirm whether these were in fact reasonable based on its understanding of risk. To confirm or modify the initial thresholds, the Bank divided the eligible population into bands that were in +/-10% increments from the initial threshold values. (e.g., Below the Line Band 1's (BTL1's) lower bound was at 10% below the threshold, BTL2' lower bound was 10% below BTL1's lower bound, etc. Similarly, Above the Line (ATL) bands were defined in a similar +10% upward direction from the threshold. An example is shown here for a $50,000 threshold:

Band	From	To
ATL5	$80,526	$88,577
ATL4	$73,205	$80,525
ATL3	$66,550	$73,204
ATL2	$60,500	$66,549
ATL1	$55,000	$60,499
Threshold	**$50,000**	**$54,999**
BTL1	$45,000	$49,999
BTL2	$40,500	$44,999
BTL3	$36,450	$40,499
BTL4	$32,805	$36,449
BTL5	$29,525	$32,804

For BTL, if at least 5% of the band's population was deemed to require auto-high processing, then the review would move down to the next band, and the process would continue until less than 5% of the accounts encountered would require auto-high processing. Similarly, if less than 5% of the accounts within an ATL band were deemed to be high risk then the review would move up to the next band until a material number of high-risk accounts were encountered. Where more than approximately 30 accounts were present in the band, the Bank performed standard 95/5/5 sampling to determine the review population, however, the non-Cash bands were relatively small so the entire band was reviewed in those cases. The details from this threshold setting exercise are covered in the Auto-High Qualitative Review summary document within the Appendix, which provides the Bank's review approach and rationale for the determined thresholds.

b) Determined Thresholds

Using the insight gained from this review exercise, the following parameters were established for auto high processing:

Segment	Transaction Type	*Monthly Total >=* **Threshold Amount**	*# of Months with Activity at or above Amount Threshold Level* **>= Threshold Count**
Business	Cash	$50,000	2
Business	IAT	$15,000	2
Business	International Wire	$250,000	2
Individual	Cash	$15,000	2
Individual	IAT	$5,000	2
Individual	International Wire	$25,000	2

Note that the number of months was not tested for ATL/BTL purposes. It definitionally met the Bank's goals for identifying activity that occurred for more than half of the months in a rating period, whose length is currently one quarter, as the Bank's intent is to identify ongoing activity at a certain level rather than a single month spike in activity for which other controls such as transaction monitoring and CTRs are in place.

G. Overall Risk Rating

The overall risk rating is based on threshold levels set at the segment level – i.e., Business and Individual. This overall risk rating determines the review frequency for the rated accounts. The
1. process by which the thresholds are set is described below along with the current thresholds set by way of this process.

Threshold Setting

Determination of the overall risk rating threshold was done using a combination of quantitative and qualitative techniques, as follows below. Further details about the exercise may be found in separate artifacts or workpapers produced for a given tuning cycle. Note that there are multiple ways to reach the initial thresholds that a more detailed review may confirm or adjust further. Based on its most recent usage, the approach described here tended to yield starting points that were, in most instances, relatively close (within 10-15%) to the final determined thresholds based on qualitative review and other related analysis:

1. Determine the score distributions (# of accounts at each risk point level) for each segment (i.e., business vs. individual)

2. Determine a starting point for the moderate and high thresholds by first considering the notional ranges for the accounts to be the scores produced by the following ranges and number of factors:

Segment	Tier	At least 3 unweighted factors having	Comments
Individual	Moderate	3.5 – 4.5 Pts/Factor	
Individual	High	4.5 – 5 Pts/Factor	
Business	Moderate	3.5 – 4.5 Pts/Factor	One of the Factors in the noted range should be Business Type
Business	High	4.5 – 5 Pts/Factor	

3. Using the notional score ranges produced by the above ranges and number of factors along with the score distribution, calculate the weighted average in each range:

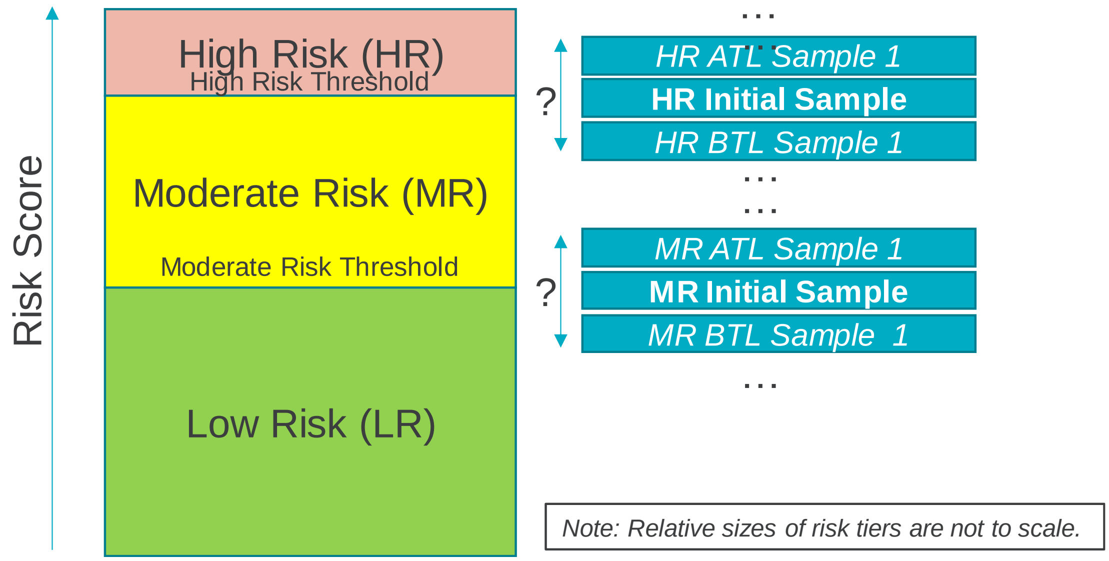
   Note: In practice, there is no guarantee an account that produces a particular risk score will have exactly 3 factors in the above ranges. Since the scoring model is essentially distilling multiple risk dimensions into a single score, this approach is merely finding a reasonable score starting point based on general expectations for how many and what levels of each factor a prototypical account at a particular risk tier will exhibit. This starting point must then be confirmed or adjusted through review of actual breakpoints in the data and qualitative review as described in subsequent steps.

4. Select a local minimum at or below the weighted average to be the starting point for the qualitative reviews as this local minimum would be indicative of a possible breakpoint between clusters of larger sub-populations.
5. Using the selected starting point, identify a number of random samples at each risk score within/near the candidate score range using a sample size dictated by the following parameters:
   a. 95% Confidence Interval
   b. 5% Margin of Error
   c. 5% Response distribution – The premise for 5% being that the risk score at a given level will be a reliable discriminator between risk tier populations.
   d. Note: A tool such as that available online at http://www.raosoft.com/samplesize.html may be used to determine the appropriate sample sizes when given the segment population at a particular risk score. In addition, it may be more efficient to pull samples for multiple scores to build a working batch of samples for possible review even if sample sizes and reviews were based on each score's population.
6. Review each sampled account in a score-wise manner generally starting with the notional threshold value for the target tier. (i.e., High or Moderate)

a. Note that when preparing the samples generally a buffer should be added around the notional score range to permit BTL (Below the Line) or ATL (Above the Line) movement by a few points, if necessary.
b. As the notional threshold value is a suggested starting point, the review team may judgmentally opt to start with a different score than the suggested value. e.g., if comfortable with the volumes presented by a given threshold, the EDD team may go directly to BTL review for that threshold level rather than starting at the threshold level then determining whether to go up or down from there.

7. Proceed with the review at the selected score and target tier with the following decision points:
   a. If 5% or more of the accounts at the currently reviewed score are in the target risk tier, lower the score by one point and repeat Step 7.
      i. Note: The 5% value corresponds to the Bank's risk tolerance and aligns to common industry practice for accuracy of the selected threshold in discriminating between risk tiers. (i.e., the score must be able to distinguish between tiers at a 95-to-5 ratio or greater.)
   b. If less than 5% of the accounts at the currently reviewed score are in the target risk tier, then this score identifies the current BTL population and the threshold is the currently reviewed score plus 1.
   c. If the review team opts to further attempt to optimize the score through ATL review, then step 7 would repeat until step 7.a yields a sufficient number, or ratio, of target risk tier accounts at which point the review stops. Since ATL reviews are primarily done for optimization, they are not strictly necessary, if the Bank takes a conservative approach and is comfortable that it can *effectively* manage volumes produced by BTL-based threshold decisions.

Note: This review process is depicted in the diagram that follows:



8. Given the way certain combinations of risk factors may add up, threshold decisions should not be made based on review of a single sample set at a single BTL score level. Rather the following additional aspects of review should be performed to confirm the threshold decisions:
    a. Perform a limited Below-BTL review by judgmentally sampling accounts within and below a few points of the BTL score to confirm that one did not just happen to select a summing "gap" that fewer combinations of points and accounts are hitting.
    b. Perform macro/cross-account analysis such as that provided by the Risk Focus Area Summary report which permits one to filter on specific risk aspects such as CIBs, NGOs, NRAs, Accounts with CTRs, etc. and observe how accounts with certain inherent high risk factors are being scored and why.
        i. Note: In a multi-dimensional risk model, it is possible for inherently higher-risk factors such as an account being a CIB account to be on an account that overall is rated less than high risk, however, the reasons for a lower rating should be explainable and reasonable. For example, an account associated with a CIB business type may be doing no material cash activity so in a balanced model that incorporates activity, these accounts will be rated lower risk than those that are actually doing a high amount of cash activity.

2. 9. Based on the results of both sample-based and cross-account analysis, document the thresholds determined and the rationale for their settings.

End of Threshold Setting Process Steps

Determined Thresholds

Using the process described above, the following thresholds were determined for the Business and Individual segments. In addition, the EDD review frequency implied by each of these ratings is shown in the table below.

Overall Risk Rating	Business Point Range	Individual Point Range	Review Frequency
Low	0 – 32	0 – 27	Trigger-driven [18]
Moderate	33 – 38	28 – 33	Every 2 years
High	39 and Above	34 and Above	Annually

The above will ensure that the Bank maintains accurate customer risk profiles and that they are reviewed and risk-rated in accordance with the established frequencies.

For Moderate and High thresholds for each segment, the Bank conducted sample-based reviews that completed in May 2020 and were guided by the above process. Based on these reviews, the Bank arrived at the threshold decisions as described below:

a) High Risk Threshold for Business

When arriving at the decision that the Business segment's threshold for High would be set at 39 points, the Bank observed that, at 39 points, over 98% of the "sample" accounts utilized a high-risk Product (i.e., DDA), operated in a moderate-risk Zip Code (local, but within a zone designated as both HIDTA and HIFCA), and had a high-risk Business Type (e.g., 445120, "Convenience Stores," which is considered by the Bank to be cash-intensive and as such high-risk). The Bank also observed that there was a higher incidence of additional risk factors, such as Tags (e.g., Privately-Owned ATMs) present. Additionally, when the Bank used the "Risk Factor Influence by Score" report to review the proportion of accounts with high-risk activity (i.e., 11 or more points) at each score level, the Bank observed a clear shift in the activity risk distribution between 38 and 39 points, such that nearly all scores below 39 had 10% or fewer accounts with a high level of transactional activity, whereas at 39, the proportion of accounts with a high level of transactional activity more than doubled, such that nearly all of the scores at and above this level had a proportion of accounts with high-risk activity from 20% to 100%.

b) Moderate Risk Threshold for Business

When arriving at the decision that the Business segment's threshold for Moderate would be set at thirty-three (33) points through thirty-eight (38) points, the Bank observed that, at 32 points, over 95% of the "sample" accounts utilized a high-risk Product (i.e., DDA), operated in a moderate-risk Zip Code (local, but within a zone designated as both HIDTA and HIFCA), and had a high-risk Business Type (e.g., 445120, "Convenience Stores," which is considered by the Bank to be cash-intensive and as such high-risk). However, there was a much lower incidence of additional risk factors, such as Tags (e.g., Home Based Business) present. Additionally, the Bank observed a much lower

[18] Low risk customers do not have an assigned periodic cycle; instead, these customers will be reviewed once there is an "event," i.e., a material change to the customer's profile. Please see Enhanced Due Diligence Procedures for further details.

incidence of transactional activity, with 85% of "sample" accounts engaging in no transactional activity during the review period.

c) High Risk Threshold for Individual

When arriving at the decision that the Individual's segment would be set at 34 points and above, the Bank observed that, at 34 points, over 60% of the "sample" accounts were geographically situated in higher-risk countries (e.g., China), and had higher-risk TIN Codes (e.g., Non-Certified SSN). The Bank also observed that there was a higher incidence of additional risk factors, such as Tags (e.g., Nonresident Alien) present on the accounts than at the scores immediately below.

d) Moderate Risk Threshold for Individual

When arriving at the decision that "moderate-risk" would be set at twenty-eight 28 points through 33 points, the Bank observed that, at 27 points, the majority of the "sample" accounts utilized a high-risk Product (i.e., DDA) and operated in a moderate-risk Zip Code (local, but within a zone designated as both HIDTA and HIFCA); however, there was a much lower incidence of additional risk factors such as Tags (e.g., Nonresident Alien). Additionally, while the Bank observed a higher incidence of transactional activity, the transactional activity observed was found to be in line with typical consumer activity, and there was a much lower incidence of additional risk factors such as Others (e.g., recently filed SAR).

RBRR Processes

Although the Bank believes the current weighting of attributes/categories in Tabs 1-6 accurately reflects the risk posed by its customers, the Bank will continue, on an as-needed basis, to revise this RBRR Methodology document and make changes to the weighting of attributes/categories depending VII. on the outcome and/or findings presented in an overall BSA/AML Risk Assessment.

A. Periodic Risk Rating

Preparation

To prepare for the quarterly risk rating, the following steps - which will typically involve AML Advisory, the EDD team, FCC Systems, and the BSA/AML Officer - should be followed:

1.

1. Determine if any model structural or threshold adjustments are required, which may involve input from any of the following:
    a. EDD team - Review any feedback from the EDD team regarding the quality and accuracy of high and moderate-rated accounts from the last run.
    b. BSA/AML Officer – Through existing organizational communications and situational awareness of Bank risk, determine whether there are any risk exposure trends or patterns of account behavior which the account risk rating process should incorporate into its ratings. In addition, review any feedback from model validations, audit, or regulators regarding model-related observations, and develop a plan to address, as necessary.
    c. Other areas of the Bank – e.g., the Bank may add new products or otherwise have changes to its portfolio that will affect the risk rating process.
2. If a model adjustment is necessary, estimate and assess the impact of making the change, which may involve any of the following:
    a. Simulation of the impact of the change through back-testing against prior model runs augmented with the change applied
    b. Ad hoc analytics / reporting focused on the area of change (e.g., how many accounts would be affected by a new tag and the impact of that tag to the overall risk level distributions)
    c. Making the changes in the test environment, executing the model, and assessing their impact. (This generally provides the best determination of impact, if the Test environment's configuration and data is up to date with production prior to making the adjustments.)
3. Follow the existing FCC Systems Change Management process for making and gaining approval for the necessary adjustments.
4. Confirm/Maintain the account tags as per the following:

<table>
<tr><th>Tag</th><th>Approach for Ensuring Account Tags are Current</th></tr>
<tr><td>314a</td><td>1. FIU notifies the AML Advisory team, as necessary, based on receipt of 314a requests.
2. If the Bank has not received any follow-up communication from the government (including any law enforcement agency) related to this account within 3 years since the Bank received a 314a request for the account, then the tag is eligible for removal.</td></tr>
<tr><td>NRA</td><td>1. Review report from Depositors' Services of all current NRAs and match this against tagged accounts.
2. NRAs are identified by the KYCU, and there is an existing notification process in place to the AML Advisory team so that the necessary tag updates can be made.</td></tr>
<tr><td>DPEP, FPEP</td><td>1. PEPs are identified by the line of business or the KYCU (Know Your Customer Unit), and there is an existing notification process in place to the AML Advisory team so that the necessary tag updates can be made.</td></tr>
<tr><td>All Trust Tags</td><td>1. Review daily new Trust account report from ODIN.
2. Request ad hoc ownership code report from FCC Systems and match this against accounts with trust tags.

Note: Trust tagging aligns to account ownership codes, as follows:

<table>
<tr><th>Ownership Code</th><th>Trust Tag</th></tr>
<tr><td>50</td><td>PEN</td></tr>
<tr><td>52</td><td>TRUST (Businesses)
INTR (Individuals)</td></tr>
<tr><td>53</td><td>TESA</td></tr>
<tr><td>74, 75</td><td>PREN</td></tr>
</table>

Further information on the above tags may be found in the section on tagging earlier in this document.</td></tr>
<tr><td>PATM</td><td>NOTE: The Bank no longer opens new accounts with private ATMs where the account owner is also responsible for cash replenishment of the ATMs.

1. FCC systems runs a report of accounts from DDM (Due Diligence Manager) for which the private ATM question was answered.</td></tr>
<tr><td>MSB</td><td>NOTE: The Bank does not open MSB accounts, however, accounts belonging to MSB agents are currently given the tag of MSB for tracking purposes. This tag carries no risk points and these businesses are rated through the business type (typically a CIB and/or NBFI). As of May 2020, all MSB-tagged accounts are associated with a high-risk business type.
1. FCC systems runs a report of accounts that answered the DDM questions for MSB against which the tagged accounts can be reconciled.
2. The KYCU also notifies the AML Advisory team on a monthly basis of new MSB agent accounts to be tagged.</td></tr>
</table>

Tag	Approach for Ensuring Account Tags are Current
RDC	1. The Product Application Support team notifies the AML Advisory team of new RDC customers and/or accounts on a quarterly basis so that the necessary updates can be made.
HBB	1. The KYCU notifies the AML Advisory team of any accounts to be tagged as HBB. 2. The branch flags the account in S1 with user flag 04, which indicates a home-based business. There is not currently a reporting capability through Miser for obtaining this information, but AML Advisory can request a one-time report to be generated by Systems and Standards, if needed.

5. If any model changes were required, then execute the updated model in the Test environment.
6. Submit to MRM (Model Risk Management) any model changes so that MRM may determine their materiality.
    a. If the changes are deemed material per the Model Risk Management Procedures, then a model validation must be conducted prior to implementation of the model in production. This will typically occur after execution of the risk rating in the Test environment. Execution is described in the next section.
7. Migrate the model changes to production and verify the configuration in production captures the changes by reviewing/confirming the following:
    a. RBRR configuration settings
    b. Post-processing parameter values
    c. Any code migrated related to the model changes (e.g., post-processing database objects)

2.

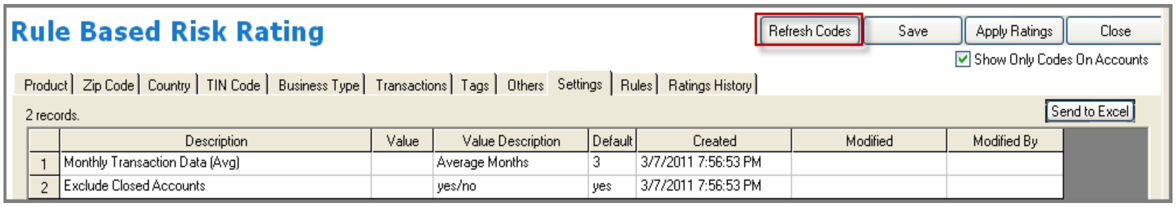
Execution

The quarterly risk rating run is performed by the Bank – generally, AML Advisory perform Steps 1-4, and FCC Systems perform the remaining steps - via the following:

1. Execute the Refresh Codes function in RBRR [19]
2. For each tab, review any new codes and assign risk points based on bank risk policy. [20]
3. Conduct a risk rating run by leveraging "Apply Ratings" function to finalize code configuration.

[19] Note: prior to completing the "Refresh Codes" process, AML Advisory performs a series of preliminary checks to ensure that certain Tags (Trusts, NRAs, PATMs, etc.) have been applied correctly, and that other conditions (e.g., TIN Codes 7 and 8 are not present, etc.) have been satisfied. See "RBRR Refresh Codes & Apply Ratings Form" within the Appendices section for further details.

[20] Note: AML Advisory also utilizes the "RBRR Refresh Codes & Apply Ratings Form" to ensure that any new item that has come in within a given Risk Component (e.g., Product, Zip Code, Business Type, etc.) is correct and receiving the appropriate amount of risk points. See "RBRR Refresh Codes & Apply Ratings Form" within the Appendices section for further details.



	Description	Value	Value Description	Default	Created	Modified	Modified By
1	Monthly Transaction Data (Avg)		Average Months	3	3/7/2011 7:56:53 PM		
2	Exclude Closed Accounts		yes/no	yes	3/7/2011 7:56:53 PM		

4. Send request to FCC Systems to execute post-processing.
5. Execute the RBRR post-processing based on receipt of post-processing request from AML Advisory.
    a. Note: The RBRR post-processing technical details are covered in separate document "RBRR Post-Processing Modules and Usage"
6. Run the group generation script to produce the relationship groups for review.
7. Use the spreadsheet lists to perform the necessary EDD review per normal processes for the following sub-populations of accounts and their relationships:
    a. Individual – High Risk
    b. Individual – Moderate Risk
    c. Business – High Risk
    d. Business – Moderate Risk

Post-Execution

3. After the model has been executed in production, the output should be reviewed, as follows:

1. Confirm that the distribution of accounts by risk level and segment align with the estimates based on model execution in the Test environment.
2. Assess the stability of the model by reviewing the Risk Level Movement report. Absent significant changes to the model or underlying data, the Bank's goal is for no more than 20% of movement in the risk levels between runs.
    a. If more than this movement is observed, the Bank should review the root cause using, for example, the Risk Drivers report to understand the sources of risk movement and determine if further action is required such as tuning.
3. Review the Risk Focus Area report to confirm that specific high-risk sub-populations (e.g., CIBs) are being rated as expected.

B. Annual Configuration Review

Although the review of codes that occurs during the quarterly review should identify most configuration items that require adjustment, a configuration review of RBRR should be conducted annually to ensure that it continues to reflect the Bank's understanding of its risks. The annual review should be performed as follows:

1. Determine whether there have been any changes to the following:

   a. The bank's AML risk assessment within the past year
   b. Material changes to the bank's customer population, geographic exposure, or products and services offered.
   c. External sources of risk information (e.g., new HIDTA or HIFCA geography designations) for which the Bank is dependent on 3rd parties to provide.
2. Confirm that the model assumptions and limitations identified earlier in this document continue to apply.
3. Through review of the various configuration tabs in RBRR, confirm that the configuration is accurate, current, and consistent with existing risk exposures.
4. As needed, update RBRR configuration based on the above evaluation.
   a. Note that significant changes to the configuration, such as overall risk thresholds, should be accompanied by a formal qualitative review / BTL analysis to confirm settings.
5. Document the results of the review.

C. Configuration Changes

Model configuration changes are any adjustment to the parameters or structure of the model that may affect its behavior and outputs. These include new or updated items associated with any of the following:

- Risk weights for the following RBRR risk components:
  - Product
  - ZIP Code
  - Country
  - TIN Type
  - Business Type
  - Transactions
- Specific risk-pointed items for the following RBRR risk components:
  - Product
  - ZIP Code
  - Country
  - TIN Type
  - Business Type (NAICS code)
  - Transaction Type
  - Tags
  - Other
- Any other RBRR system configuration changes, which may include:
  - Vendor updates/patches
  - Changes to global RBRR parameters such as the number of months over which to take the transaction average when computing transaction risk points
- RBRR post-processing changes including:
  - Post-processing logic updates outside of RBRR including any new parameters to support the new/adjusted logic
  - Parameter updates including those for:
    - Transaction capping
    - Final risk threshold levels
    - Auto-high amount and month thresholds

The change management process for the model is covered by the existing FCC Systems Change Management process and follows the same approval process, however, MRM must also review the changes for materiality so that applicability of model re-validation can be determined.

Example: Customer Risk Rating Calculation in RBRR

A. Overview

The following example illustrates an example risk rating produced via the model. This covers the full breadth of the model processing from the RBRR module through auto-high in post-processing.

VIII Example:

An existing Home-Based and Professional Service Provider business customer opened a new Business Checking account (IOLA NOW Checking) at the Bank. The customer, located in Riverside, California, has a certified EIN and provides legal services. In the two weeks since the account was opened, the Bank's monitoring system identified suspicious activity in one of the customer's older, existing accounts; the customer conducted 13 cash deposits totaling $27,000, which was a deviation from the customer's expected activity. As a result, the Bank filed a SAR and named this customer as a suspect for structuring cash deposits to evade CTR filing requirements.

B. RBRR Points

Example of Point Calculation in RBRR for a Customer Account						
Attributes/ Categories	**Description 1**	**Description 2**	**Assigned Points in RBRR**	**Weight**	**Points Total in RBRR[21]**	**Add-on Points in RBRR**
Product	Business Checking	IOLA NOW Checking	4	2	**8**	N/A
Zip Code	92506	Riverside, CA	4	2	**8**	N/A
Country	United States		0	3	**0**	N/A
TIN Code	Certified EIN		0	3	**0**	N/A
Business Type	541110 - Professional, Scientific, and Technical Services	Offices of Lawyers	5	4	**20**	N/A
Transactions - Dollar	Cash – Business Checking	$20,000.01 to $30,000.00	3	1	**3**	N/A
Transactions – Frequency	Cash in	11 to 13	4	1	**4**	N/A

[21] Note – As stated elsewhere in this document, point total in RBRR +for the Transaction risk factors is capped at 15, regardless of calculated total by RBRR.

Example of Point Calculation in RBRR for a Customer Account						
Attributes/ Categories	**Description 1**	**Description 2**	**Add-on Points**	**Weight**	**Points Total in RBRR**	**Add-on Points in RBRR**
SAR Filing	# of days since SAR filing 121-365	SAR filed on day 180	3	N/A	N/A	**3**
Open Acct	# of days account (existing customer) was opened: <=90	New Account for Existing Customer	1	N/A	N/A	**1**
Tags	HBB	Home Based Business	6	N/A	N/A	**6**
					43	**10**
Total RBRR calculated points					53	

C. Segmentation

RBRR post-processing assigns the segment, as follows:

Seq #	Rule Condition	Assigned Segment if True	Assigned Segment
1	Business Type Is Populated	True	B = Business
2	TIN Type is one of: 1 (Certified EIN) 3 (Uncertified EIN) EIN (EIN from McCracken)	n/a	
3	TIN Type is 9 (Certified Tax Exempt)	n/a	
4	Else (Individual)	n/a	

D. Capping

The transaction risk points total to 7 points and do not exceed 15 points so capping does not apply. If the points had exceeded 15 points, then the above score would be re-calculated by substituting 15 (the transaction capping limit) for the actual transaction risk points.

E. Auto-High

The account has the following activity levels:

<table>
<tr><th>Rating Month</th><th>Cash In</th><th>Cash Out</th><th>Total Cash</th><th>Int Wire In</th><th>Int Wire Out</th><th>Total Int Wire</th><th>IAT Credit</th><th>IAT Debit</th><th>Total IAT</th></tr>
<tr><td>1</td><td>$30,000</td><td>$20,000</td><td>$50,000</td><td>$20,000</td><td>$0</td><td>$20,000</td><td>$500</td><td>$0</td><td>$500</td></tr>
<tr><td>2</td><td>$10,000</td><td>$30,000</td><td>$40,000</td><td>$0</td><td>$0</td><td>$0</td><td>$2,000</td><td>$0</td><td>$2,000</td></tr>
<tr><td>3</td><td>$60,000</td><td>$0</td><td>$60,000</td><td>$0</td><td>$0</td><td>$0</td><td>$250</td><td>$1000</td><td>$1,250</td></tr>
<tr><td colspan="10"></td></tr>
<tr><td></td><td colspan="2">2 months at or above business cash threshold of $50,000?</td><td>Yes</td><td colspan="2">2 months at or above business international wire threshold of $250,000?</td><td>No</td><td colspan="2">2 months at or above the business IAT threshold of $15,000?</td><td>No</td></tr>
</table>

At least one of the activity types qualifies for auto-high so the account qualifies for auto-high. However, with the points from RBRR and capping, the account was already at the high-risk level, so no change is made to the score or risk level.

F. Final Risk Level Setting

The account has been segmented as a Business account and already qualifies for a risk level rating of High based on the points after the RBRR module and capping have executed. (i.e., 53 points) The account also qualifies for the high-risk level based on auto-high processing. Since the account was already in the high-risk level before auto-high processing, no change is made to the risk points or the risk level based on auto-high processing. If the account were below the high-risk level after capping and qualified for auto-high, then its risk level would be set to High and the final score would be set to the lower bound threshold for a high-risk business account, which is 39 points.

Appendix

Auto High Testing Summary 20200519.(

FCC Systems RBRR Refresh and Apply Ra

IX.