

**EAST WEST BANCORP, INC.**

**Model Risk Management**

**Model vs. Non-Model Assessment Form (MRM-Control01)**

**(CONTROL 1)**

**Version: v03**

# The Model vs. Non-Model Assessment Questionnaires

**To All Potential Model Owners: The ENTIRE “Model vs. Non-Model Assessment Questionnaires” section needs to be filled out by your team.**

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| **Completed by:** | **Nicholas Lawhon** |
| **Completed Date:** | **07/02/2024** |
| **Quantitative Process Name** | **Alipay (Model ID: 059)** |
| **Quantitative Process Description & Objective** | **Objective: *Instruction:*** *Please provide the objective/business purpose of this model*  The Digital Bank offers customers the ability to send Alipay transactions. Alipay is a third-party mobile and payment provider created by Alibaba Group. You can think of Alipay transactions as P2P (person to person, like Zelle) transactions. Digital Banking allows customers to make Alipay transactions using either a phone number or email address as tokens (again - very similar to Zelle). Alipay maintains two sets of fraud detection platforms that interrogate Alipay transactions. These fraud detection platforms leverage local regulator rules/ML/graph/AI/real-time detection techniques. The exact details of the rules’ engines have not been shared due to Intellectual Property concerns.  **MRM:** Global Remittance Risk Management – Alipay Global Remittance RDD Only  “Alipay maintains two technical fraud detection platforms powered predominantly by local regulator rules/machine Learning/graph/AI/real-time detection techniques. Both platforms use a very large dataset of the data points available regarding our customers, their transactions, and any other relevant information. The Platforms are built and maintained by our internal Fraud detect team, who ensure the stability and improvement of all these methodologies. In addition, the development and implementation are done by the Fraud detect team.  These platforms are built on several systems that consist of various models and rules, which contain features indicating the variety of fraud risks we encounter in our platform (e.g. from multiple account usage indicators to payment velocity).  Our fraud prevention platforms check every payment in addition to customer accounts (also known as profiles) and assign a score reflecting the probability of this customer transaction being fraudulent. If the score exceeds our risk threshold, the account and the transaction(s) are suspended for manual review by our operational fraud detection team. All suspended transactions are subject to manual review before proceeding with the transaction and need to be cleared up by our operational team.  In addition to training the model based on users’ history transactions and behaviors, our operational, analytical, and engineering teams continue to work very closely to ensure that any new fraud prevention and detection features are implemented into our machine learning system, and we ensure a great level of accuracy. Based on the trends and patterns observed by the Fraud detect team and the team’s previous experience, Alipay can implement graph knowledge algorithms and dynamic rules to better detect and prevent any fraudulent activity within these two platforms.”  **High Level Description:**   1. Portfolios, Products, and/or Banking Transaction Channels the Quantitative Process Applies to: ***Instruction:*** *Please list the portfolio names and dollar amount (e.g., total commitment amount, total balance amount, etc.) this quantitative process is applied to.*   Alipay applies to all Digital Banking customers. As of December 22, 2023, there were 235,707 customers using Digital Banking, aggregate portfolio balance of $13,423,190,047.19. Alipay transactions apply to customers who use Digital Banking.   1. In-house Built or Vendor Built (*Please include the vendor’s name*):   Vendor – Alipay, <https://www.alipay.com/>  MRM Question: In the Bank’s TPRM site, there are two Alipays—one for HK and one for Asia (assume). Does this Alipay in this document meant for both Alipay? Please provide more detail.  Nicholas Lawhon: The vendor’s name is Alipay – created by Alibaba Group. For TPRM, we updated question 5 for Alipay (Asia). This document speaks to our implementation of Alipay - which does not involve Hong Kong.   1. Date of First Use and Current Status:   Alipay was first offered by the Digital Bank in 2020 and is still in use today.   1. Input Data: ***Instruction:*** *Please provide high level description of data that are needed to use this process*   Alipay has not shared the specific input data elements, but we know they are running two fraud detection platforms that leverage the following: local regulator rules/ML/graph/AI/real-time detection techniques.  Input data from the EWB perspective are the individual Alipay transaction details – please see example Alipay Transaction Payload.txt which contains the data fields (uploaded to Sally Mayo One Drive)     1. Assumptions and Limitations: ***Instruction:*** *Please* *describe key assumptions and limitations of this quantitative process)*   Assume that the Alipay fraud detection platforms provide adequate coverage in terms of the various fraud risk typologies. Another assumption we have is the there is a feedback loop that that utilizes tagged fraud data to optimize the models.  The biggest limitation is that Alipay will not share the specific rules/logic per Intellectual Property considerations.   1. Production Environment: ***Instruction:*** *Please describe in what environment this quantitative process is being used (e.g., excel, computer program, or vendor/internal built platforms, etc.)*   The production environment that utilizes Alipay is the Digital Banking production environment which covers the Mobile Apps & Online Banking platforms. Digital Banking offers customers the ability to send Alipay transactions using either their email or phone number as a token for payments (similar to Zelle). One can think of Alipay as being just another payment method offered by Digital Banking - like ACH, Wires, and Zelle. We do send Alipay data via a transaction payload which contains the transaction details needed by Alipay to facilitate the transaction.   1. Output and Usage (e.g., management reporting, regulatory reporting): ***Instruction:*** *Please describe how the quantitative process’ output is used. If there are more than one use, please list and describe all.*   The key output of Alipay fraud detection platforms is the score assigned after the fraud rules are run on a given transaction. If the score exceeds the risk threshold, the account and transaction are sent to manual review by the Alipay operational fraud detection team.   1. Output Impact (e.g., business decision and reputation):   The output impact is whether the transaction is allowed to proceed or not – as determined by the Alipay fraud scoring and Alipay operational fraud detection team.   1. Does this process directly use output of other models as input data?   No – N/A from an EWB perspective.   1. Does this process output directly feed into other models?   No – N/A from an EWB perspective.   1. Please list and provide the model/system/platform related documentation (e.g., methodology documentation, whitepaper, process flow, user’s guide, etc.)  * AliPay Risk Information.pdf * Sample Alipay Transaction Payload.txt * GR solution brief-Risk Management Sharing.pdf * Sample Alipay Transaction Payload.txt |
| **Quantitative Process Owner & Business Group** | **Centralized Operations Administration** |
| **Quantitative Process Users & Business Group** | **Digital Banking** |
| **Final Conclusion by MRM** | ***\*Note:*** *The Final Conclusion is completed by MRM only.*  This is an AI/ML vendor product. It is a model. |
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| **#** | **Model vs. Non-Model Assessment Questions** | **Yes/No Rationales** |
| **Please Note:**   * Model Owners are required to provide detailed rationales with appropriate and adequate supporting information addressing each Yes or No answer for MRM to perform Model vs. Non-Model evaluation. * The final Model vs. Non-Model decision is going to be based on qualitative evaluation of below question responses and associated rationales. | | |
| **1** | **Are one or more input data and/or assumptions inherently uncertain?** | |
|  | * **Guideline for Yes:** The input data and assumptions are inherently uncertain, propagating uncertainty into the output. Some inputs may be inferred by mathematical methods or based on expert judgment. | ***Instruction:*** *Please provide detailed rationale and supporting materials for your Yes or No answer.*  **Owner:** Yes – since Alipay is running two fraud detection platforms to identify high risk transactions which leverage the following: local regulator rules/ML/graph/AI/real-time detection techniques.    **MRM:** No additional comment. |
| * **Guideline for No:** The “true”, real-world values of the input data and assumptions are known with certainty. |
| **2** | **Does the choice of methodology yield some variation in the results?** | |
|  | * **Guideline for Yes:** Many methodologies can be used to reasonably implement the theory, yielding some variation in the results. The results are not necessarily “correct/incorrect” but rather “better/worse” based on expert judgment and performance. Benchmarking results are comparable but not exactly the same. | ***Instruction:*** *Please provide detailed rationale and supporting materials for your Yes or No answer.*  **Owner:** Yes – since there is the use of the following: local regulator rules/ML/graph/AI/real-time detection techniques.    **MRM:** No additional comment. |
| * **Guideline for No:** The arithmetic calculation is objectively “correct” and precise regardless of the methodology used because there is only one generally accepted answer. |
| **3** | **Are mathematical theories such as behavioral, probabilistic, statistical, or fuzzy logic used to quantify uncertainty?** | |
|  | * **Guideline for Yes:** Behavioral, probabilistic, statistical, or fuzzy logic theories are used on top of the arithmetic calculations to measure, analyze, or simulate uncertainty. Models are generally trying to solve complicated problems without an exact solution. | ***Instruction:*** *Please provide detailed rationale and supporting materials for your Yes or No answer.*  **Owner:** Yes – since Alipay are running local regulator rules/ML/graph/AI/real-time detection techniques.  **MRM:** No additional comment. |
| * **Guideline for No:** Complex mathematical theories are not used to quantify uncertainty in the calculations. |
| **4** | **Are businesses rules used that require ongoing optimization or calibration?** | |
|  | * **Guideline for Yes:** Business rules are used that require optimization or calibration in order to fine tune performance on an ongoing basis. | ***Instruction:*** *Please provide detailed rationale and supporting materials for your Yes or No answer.*  **Owner:** Yes – but the rules are solely maintained by Alipay and are not shared with EWB.    **MRM:** No additional comment. |
| * **Guideline for No:** Data is simply recast by aggregating, mapping, or categorizing using objective business rules. |
| **5** | **Is the output a forward-looking forecast and can be back-tested?** | |
|  | * **Guideline for Yes:** If the output is a forward-looking forecast and implies a level of uncertainty about the outputs, it qualifies as a “quantitative estimate”. Back-testing can be used to gauge the model performance by comparing the model forecast against actual historical outcomes. | ***Instruction:*** *Please provide detailed rationale and supporting materials for your Yes or No answer.*  **Owner:** Yes – since the fraud models are predicting the probability of a transaction as being fraudulent there is a certain degree of uncertainty.  **MRM:** No additional comment. |
| * **Guideline for No:** The output is not a forecast and there is little or no uncertainty; it generates defined arithmetic results with “right” or “wrong” answer if different arithmetic methodologies used; in addition, back-testing would not generate any particular value. |

**Below please find supplemental information MRM would like to share with your team regarding the Model vs Non-Model Assessment process. Please note that these are for your information only.**

# Appendix 1. Overview of the Assessment

The **Model vs. Non-Model Assessment Process (MRM-Control01)** described in this document is to support the Model Owners in the effort of analyzing and categorizing quantitative processes as Model or Non-Model. It is intended to establish operating process and standard guidelines to fulfill actions necessary to execute and support requirements outlined in the Model Risk Management (MRM) Policy (MRM-PnP01) and Procedures (MRM-PnP02). Instructions and guidelines in this document are applicable to and required for all East West Bancorp, Inc., East West Bank (U.S.), Hong Kong, and China’s (collectively, “EWB” or “Bank”) quantitative processes.

This Model vs. Non-Model Assessment Process supports the enterprise-wide MRM Framework and is not intended to replace any entity procedures (e.g., the Greater China).

# Appendix 2. Description of the Model vs. Non-Model Assessment (CONTROL 1) Methodology

## The Model vs. Non-Model Assessment Categories

The Model vs. Non-Model Assessment is categorized in three areas:

1. **The Information Input Component (Inputs) –** Delivers specific assumptions, theories, and data to the quantitative estimation process

* Data Inputs
* Assumptions
* Scenarios

1. **The Processing Component (Analytical Techniques) –** Transforms inputs into quantitative estimates

* Statistical Theories
* Economic Theories
* Financial Theories
* Mathematical Theories

1. **The Reporting Component (Quantitative Estimation Report) –** Translates the quantitative estimates into useful business information for decision making

* Forecasting
* Estimation
* Management Decision Support

**Definition of a Model per SR 11-7:**

“… the term model refers to a quantitative method, system, or approach that applies statistical, economic, financial, or mathematical theories, techniques, and assumptions to process input data into quantitative estimates.”

**“A model consists of three components:**

* an information input component, which delivers assumptions and data to the model;
* a processing component, which transforms inputs into estimates; and
* a reporting component, which translates the estimates into useful business information.”

Models meeting this definition might be used for analyzing business strategies, informing business decisions, identifying and measuring risks, valuing exposures, instruments or positions, conducting stress testing, assessing adequacy of capital, managing client assets, measuring compliance with internal limits, maintaining the formal control apparatus of the bank, or meeting financial or regulatory reporting requirements and issuing public disclosures. The definition of model also covers quantitative approaches whose inputs are partially or wholly qualitative or based on expert judgment, provided that the output is quantitative in nature.”

## The Model vs. Non-Model Assessment Steps

Steps used for Model vs. Non-Model identification and assessment are:

* **Step 1:** Owners or Users of quantitative processes (refer to MRM Policy, MRM-PnP01 and MRM Procedure, MRM-PnP02 Roles and Responsibilities) are required to proactively submit a designated form, The MRM Model vs. Non-Model Assessment Form, to MRM to perform a “Model vs. Non-Model” assessment and determine whether the quantitative process is a model as defined in the Policy.
* **Step 2:** The MRM group will review submitted information and viewpoints of the Owner/User before making final determination of whether the quantitative process is a model. MRM will communicate with the Owner/User of the quantitative process classification results.
* **Step 3:** Should it be a model, MRM will work with the Owner/User to obtain additional required information for entering it into the **MRM** **Model Inventory** with information such as, model owner, business segments the model is applied to and each business use of the model.

# Appendix 3. Overview of the MRM Framework

The MRM Framework is comprised of the 11-controls for managing model risk at the Bank. These controls align with various stages of a model’s end-to-end lifecycle. This Model vs. Non-Model Assessment Process addresses **Control 1: Model Identification**.

**End-to-End Model Lifecycle and Model Risk Management Framework**

**Model Life Cycle**

**Model Risk Management Framework Controls**

**CONTROL 9**

**Ongoing Model Performance & Risk Monitoring**

**CONTROL 10**

**Model Change Management**

**CONTROL 8**

**Model Production Usage**

**CONTROL 6**

**Independent Model Validation**

**CONTROL 7**

**Model Approval for Production**

**CONTROL 1**

**Model Identification & Enterprise-wide Model Inventory**

**CONTROL 2**

**Model Inherent Risk Rating**

**CONTROL 3**

**Model Development**

**CONTROL 4**

**Model Production Implementation**

**CONTROL 5**

**Model Methodology, Production Implementation & Data Quality Assessment Documentation**

**CONTROL 11**

**Model Governance (Policy, Procedures, Guidelines and Templates) & Risk Reporting**

# MRM Control 1 Assessment Form Change Log

***Please Note:*** *This assessment form will only be revised when needed. However, the form is being evaluated when is in use for potential enhancement.*

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| **#** | **Doc. Version** | **High Level Change Description** | **Doc. Change Date** | **Section Changed** |
| 1 | v01 | First version | 10/31/2018 | All |
| 2 | v01 | Minor format update | 09/03/2020 | Throughout |
| 3 | v02 | Added SR 11-7 model definition in section C. | 03/03/2022 | Section C |
| 4 | v03 | Re-ordered the assessment form; no change on content | 01/11/2023 | Throughout |
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