**Model Name**

*Model ID# 2351*

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**Model User(s):**  EMEA Regulatory Reporting Teams

**Documentation Date:** Monday 19, September, 2016

**Purpose and Use**

1. Purpose of Model: The model estimates funds clients need to support their operational requirements and defines all other funds as excess; this is performed only for eligible operational deposits at the local and consolidated level. Definitions that guide this model are from the capital regulation requirement[[1]](#footnote-1), the Commission Delegated Regulation (EU) 2015/61 and the guidance of the Liquidity Coverage Ratio (“LCR”) report (C 73.00 - LIQUIDITY COVERAGE – OUTFLOWS). Overall, these values support BNYM’s measurement of liquidity risk as they are ultimately used in its LCR.
2. Areas of Use: This model is specifically designed for Liquidity Coverage Ratio (“LCR”) reports of the following EMEA entities: i.e. BNY Mellon SA/NV (consolidated), BNY Mellon International Ltd. (UK bank) (MIL), BNY Mellon UK Group (HUK) (consolidated), BNY Mellon Luxembourg SA (consolidated), BNY Mellon Frankfurt Branch, BNY Mellon Brussels Branch – to be collectively referred to as “BNYM EMEA entities”.
3. Model Family: None. There are no models that feed in to this calculation, nor any models that depend on its results.
4. Limitations: The model lack of data in stressed period, it is doubtful to use the output directly in the stressed scenarios

Background

## The Liquidity Coverage Ratio and operational deposits

The Liquidity Coverage Ratio (“LCR) measures a firms’ liquidity stress over a 30 day period by dividing the firm’s pool of liquid securities (i.e. HQLA) by the firm’s stressed net cash outflows during that period.

*What are operational deposits*

Operational deposits provide a stable, predictable source of funding during normal and stressed financial market conditions. Operational deposits therefore have 25% outflow rate applied in the LCR. The excess of client deposits less operational deposits are non-operational deposits. The non-operational balances have an outflow rate of 100%.

*Why calculate the operational deposit balance*

As operational deposits attract 25% outflow, compared to non-operational balances 100%, the split of operational / non-operational can impact the LCR ratio.

Client deposits (outflows) may be operational and non-operational in nature. Therefore customer deposits (outflows) need to be computed as to those deposit balances deemed operational (25% outflow) and those client deposit balances which are non-operational (100% outflow).

*How are balances used in the LCR*

The computed operational and non-operational deposit balances are then used in the Liquidity Coverage Ratio (“LCR”) regulatory reporting to calculate the Liquidity Coverage Ratio as required under European LCR regulatory requirements (EU Delegated Regulation 2015/61).

## ODM Model description

This EU LCR model has been designed for determining operational deposits of BNY Mellon EMEA entities under European LCR regulatory requirements (EU Delegated Regulation 2015/61): BNY Mellon SA/NV (consolidated and standalone), BNY Mellon International Ltd. (UK bank) (MIL), BNY Mellon UK Group (HUK) (consolidated), BNY Mellon Luxembourg SA (consolidated), BNY Mellon Frankfurt Branch, BNY Mellon Brussels Branch.

|  |  |
| --- | --- |
| **Entity** | **Entity\_id** |
| BNYM SA/NV (consolidated and standalone) | 520, 521, 522, 523, 528, 539, 650, 870 |
| BNY Mellon Luxembourg SA (consolidated) | 315, 514 |
| BNY Mellon Frankfurt Branch | 276 |
| BNY Mellon Brussels Branch | 297 |
| BNY Mellon International Ltd. (UK bank) (MIL) | 181, 223, 366, 419 |
| BNY Mellon UK Group (HUK) (consolidated) | 183 + MIL+ 271,  Note that 183 is the holding company and 271 (CAML) is non trading entity and do not contribute to the overall operational deposit balance, hence materially HUK and MIL have the same OD balances which reside in entities 181 and 419. |

The ODM model calculates the operational deposit balance for use in the Liquidity Coverage Ratio (“LCR”) reports of the following EMEA entities and follows the Activity Based Balance (ABB) model

## ABB model

The ABB model is used to determine operational deposits (“core deposits”) for the EMEA entities in scope.

The ABB approach defines the concept of “activity based balance” as the cash balances maintained by the depositor to support its operational activities.

This operational activity is evidenced by the total outflows over a given time period, on accounts which have been identified as “operational” balances.

## Model requirements

The LCR Operational Deposits Model must satisfy four requirements:

* **The model must demonstrate a methodology for identifying any deposits in excess of the amounts required to provide operational services. Excess deposits will not qualify as operational deposits:** the ABB model applies a threshold (or cap) for determining operational deposits. If on a given day, the end-of-day cash present in a client account is lower than the historical cash used to cover transactions in this account, the model will consider the end-of-day balance as the projected operational balance for the next 30 days. On the other hand, any end-of-day cash present in a client account exceeding the historical cash used to cover transactions will be considered as excess balance, hence non-operational.
* **The model must take into account the volatility of the average deposit balance to ensure the proper identification of excess balances:** this requirement is addressed in that the model considers average monthly end-of-day balances and average outflows over six months. This allows normalisation of model outcomes (by reducing the impact of exceptional events).
* **The bank must demonstrate that deposits are empirically linked to the operational services:** EMEA entities solely provide Asset Servicing, which relate to clearing, custody, cash management or other comparable services in line with regulatory guidelines. Therefore, all outflows observed on cash deposits are considered to arise out of operational services.
* **Assessment of operational deposits should be performed at a sufficient granular level to monitor client behaviour:** The ABB model is applied at client level[[2]](#footnote-2) prior to aggregation at the global level and therefore allows taking into account the behaviour at a sufficient granular level.

## Eligible client deposit balances and EU Regulation

In order to qualify as eligible operational deposit balances, regulatory conditions need to be satisfied.

The only relevant category of operational deposits for BNY Mellon EMEA entities under the EU Delegated Regulation is described under Article 27(1)(a)[[3]](#footnote-3): “*deposits that are maintained by the depositor in order to obtain clearing, custody, cash management or other comparable services in the context of an established operational relationship from the credit institution”.*

The scope of eligible operational deposits is further narrowed down by reference to the criteria set out in Articles 27(4), 27(5) and 30(2), applying the tests below either to include or exclude deposits as appropriate:

*“27. 4. Clearing, custody, cash management or other comparable services referred to in points (a) and (d) of paragraph 1 only cover such services to the extent that they are rendered in the context of an established relationship which is critically important to the depositor. Deposits referred to in points (a), (c) and (d) of paragraph 1 shall have significant legal or operational limitations that make significant withdrawals within 30 calendar days unlikely. Funds in excess of those required for the provision of operational services shall be treated as non-operational deposits.”*

*“27. 5. Deposits arising out of a correspondent banking relationship or from the provision of prime brokerage services shall not be treated as an operational deposit and shall receive a 100% outflow rate.”*

*“30. 2. Credit institutions shall calculate and notify to the competent authorities an additional outflow for all contracts entered into the contractual conditions of which lead within 30 calendar days and following a material deterioration of the credit quality of the credit institution to additional liquidity outflows or collateral needs. Credit institutions shall notify the competent authorities of this outflow no later than the submission of the reporting in accordance with Article 415 of Regulation (EU) No 575/2013. Where competent authorities consider such outflows material in relation to the potential liquidity outflows of the credit institution, they shall require the credit institution to add an additional outflow for those contracts corresponding to the additional collateral needs or cash outflows resulting from a material deterioration in the credit quality of the credit institution corresponding to a downgrade in its external credit assessment by three notches. The credit institution shall apply a 100 % outflow rate to those additional collateral or cash outflows. The credit institution shall regularly review the extent of this material deterioration in the light of what is relevant under the contracts it has entered into and shall notify the result of its review to the competent authorities.”*

Against this starting point, the model further refers to certain Q&A guidance published by the EBA to determine whether deposits can properly be treated as operational deposits, including Q&A 2013\_480 and Q&A 2013\_135.

2013\_480 *“In accordance with Article 422(3)(a) of Regulation (EU) No. 575/2013 (CRR) institutions shall multiply liabilities resulting from deposits that have to be maintained by the depositor in order to obtain clearing, custody or cash management or other comparable services from the institution by 5% to the extent to which they are covered by a Deposit Guarantee Scheme in accordance with Directive 94/19/EC or an equivalent deposit guarantee scheme in a third country, and by 25% otherwise.*

*In accordance with Article 422(4) sub paragraph 1 of the CRR, clearing, custody or cash management or other comparable services referred to in point (a) and (d) of paragraph 1 of that article only covers such services to the extent that they are rendered in the context of an established relationship on which the depositor has substantial dependency, meaning that the client shall be unable to withdraw amounts legally due over a 30 day horizon without compromising its operational functioning. Moreover, they shall not merely consist in correspondent banking or prime brokerage services. The institution shall have evidence that the client is unable to withdraw amounts legally due over a 30 day horizon without compromising its operational functioning.*

*Article 422(4) second subparagraph of the CRR states that, pending a uniform definition of an established operational relationship, institutions shall themselves establish the criteria to identify an established operational relationship for which they have evidence that the client is unable to draw amounts legally due over 30 days without compromising its operational functioning. The institution shall report these criteria to the competent authorities. In the absence of a uniform definition competent authorities may provide general guidance. It should be noted that the Report provided by EBA to the Commission under Article 509(1) of the CRR assesses the definition of established relationship for non-financial customer as referred to in Article 422(3)(c) of the CRR in accordance with paragraph (2)(k) of the Article 509(1).*

*Notwithstanding the above mentioned articles and any guidance provided by competent authorities in the absence of a uniform definition, for deposits under Article 422(3)(a) and (d) of the CRR, institutions can provide different forms of evidence that a client cannot withdraw the deposited amount over a 30 day horizon without compromising its operational functioning.* [Q&A 135](http://www.eba.europa.eu/single-rule-book-qa?p_p_id=questions_and_answers_WAR_questions_and_answersportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=1&p_p_col_count=2&_questions_and_answers_WAR_questions_and_answersportlet_jspPage=%2Fhtml%2Fquestions%2Fviewquestion.jsp&_questions_and_answers_WAR_questions_and_answersportlet_viewTab=1&_questions_and_answers_WAR_questions_and_answersportlet_questionId=369558&_questions_and_answers_WAR_questions_and_answersportlet_statusSearch=1#search) *provides some elements to inform institutions of the different forms of evidence they can provide to demonstrate that a client cannot withdraw the deposited amount.*

*Furthermore, for reporting purposes, institutions are encouraged to consider the following criteria to identify qualifying activities in the context of clearing, custody or cash management or other comparable services activities:*

* *the customer is reliant on the bank to perform these services as an independent third party intermediary in order to fulfil its normal banking activities over the next 30 days. For example, this condition would not be met if the bank is aware that the customer has adequate back-up arrangements;*
* *these services must be provided under a legally binding agreement to institutional customers; and*
* *the termination of such agreements shall be subject either to a notice period of at least 30 days or significant switching costs (such as those related to transaction, information technology, early termination or legal costs) to be borne by the customer if the operational deposits are moved before 30 days.”*

2013\_135 “*Article 422(4) second subparagraph of Regulation (EU) No 575/2013 (CRR) states* *that, pending a uniform definition on an established operational relationship, institutions shall themselves establish the criteria to identify an established operational relationship for which they have a evidence that the client is unable to draw amount legally due over 30 days without compromising their operational functioning. The institution shall report these criteria to the competent authority. In the absence of a uniform definition competent authorities may provide general guidance.*

*Notwithstanding the above mentioned article and any guidance provided by competent authorities in the absence of a uniform definition, for deposits under Article 422(3)(a) and (d), institutions can provide different forms of evidence that a client cannot withdraw deposited amount. These could include, for example, the following elements:*

* *minimum end of day credit balance which has been proved to be stable over time;*
* *deposits are by-products of the underlying services provided by the banking organization and not sought out in the wholesale market in the sole interest of offering interest income;*
* *deposits are held in specifically designated accounts and priced without giving an economic incentive to the customer (not limited to paying market interest rates) to leave any excess funds on these accounts.*

*As regards reporting of deposits from financials, it should be noted that while Article 509(2)(k) is clearly focused on established operational relationships with non-financial customers, Article 422(3)(c) refers to operational deposits that have to be maintained by the depositor in the context of an established operational relationship other than those reported in accordance with Article 422(3)(a), and as such, operational deposits from financial customers are not excluded from being reported in accordance with Article 422(3)(c).”*

**Model Specification**

1. Methodology

Model description

The Operational Deposits Model (“ODM”) has been developed to assess the level of client deposits required for the provision of operational services in accordance with the EU Delegated Regulation 2015/61.

The model consists in two main steps:

Identifying “eligible” client accounts, based on pre-defined eligibility criteria;

From “eligible” client accounts, assessing the level of deposits required for the provision of operational services at customer level, based on end-of-day deposits balances and historical transactions.

The definitions that guide this model are based on the Capital Requirements Regulation[[4]](#footnote-4), the EU Delegated Regulation 2015/61 and the guidance of the LCR report (C 73.00 - LIQUIDITY COVERAGE – OUTFLOWS).

The Operational Deposits Model (ODM) has been developed to assess the level of client deposits required for the provision of operational services in accordance with the EU Delegated Regulation 2015/61.

The model consists in two main steps:

1. Identifying “eligible” client accounts based on pre-defined eligibility criteria. Note that eligible client accounts only apply to third party clients; in order to ensure a symmetric treatment of intercompany deposits and placements across the BNY Mellon group, all intercompany deposits and placements are treated as non-operational, subject to 100% outflow/ inflow respectively;
2. From “eligible” operational client accounts, assessing the level of deposits required for the provision of operational services at customer level, based on end-of-day deposits balances and on historical transactions.

The definitions that guide this model are based on the Capital Requirements Regulation[[5]](#footnote-5), the EU Delegated Regulation 2015/61 and the guidance of the LCR report (C 73.00 - LIQUIDITY COVERAGE – OUTFLOWS).

Calculation principles

The ABB model projects “core” operational deposits (and excess deposits balances) at client level over the next 30 days as the monthly average operational deposits (actual business days calculated by the country calendar set out in FRR application). The daily operational deposits are computed as the minimum between the client’s end-of-day balance and the average outflow over six months. Client level results are then aggregated to company/branch level.

The average outflow over six months is computed as the average daily debit balances on the client’s accounts over this period. This is the average the sum of the outflow in the past 6 months.

**Model requirements**

The LCR Operational Deposits Model must satisfy three Requirements and one Guidance:

* **Model Requirement 1: The model must demonstrate a methodology for identifying any deposits in excess of the amounts required to provide operational services. Excess deposits will not qualify as operational deposits**

The ABB model applies a threshold (or cap) for determining operational deposits. If on a given day, the end-of-day cash present in a client account is lower than the historical cash used to cover transactions in this account, the model will consider the end-of-day balance as the projected operational balance for the next 30 days. On the other hand, any end-of-day cash present in a client account exceeding the historical cash used to cover transactions will be considered as excess balance, hence non-operational.

* **Model Requirement 2: The model must take into account the volatility of the average deposit balance to ensure the proper identification of excess balances**

This requirement is addressed in that the model considers average monthly end-of-day balances and average outflows over six months. This allows normalisation of model outcomes (by reducing the impact of exceptional events).

* **Model Requirement 3: The bank must demonstrate that deposits are empirically linked to the operational services**

EMEA entities solely provide Asset Servicing, which relate to clearing, custody, cash management or other comparable services in line with regulatory guidelines. Therefore, all outflows observed on cash deposits are considered to arise out of operational services.

* **Model Guidance 1: Assessment of operational deposits should be performed at a sufficient granular level to monitor client behaviour**

The ABB model is applied at client level[[6]](#footnote-6) prior to aggregation at the global level and therefore allows taking into account the behaviour at a sufficient granular level.

Assumptions

There are four key assumptions of the EMEA LCR model.

* + - 1. Historical approach
      2. Operational attributes
      3. Customers with less than six months historical transactional data
      4. Operational deposits

***Assumption #1: Historical approach***

It is assumed that the historical demand for operational services will hold for at least one month following the measurement date. The underlying assumption is that customer behaviour will only change gradually and would be captured by the activity based balance that relies on the previous six months data.

***Assumption #2: Operational attributes***

As a consequence of the selection process of eligible operational accounts, all selected accounts are assumed to be operational accounts. By nature, all transactions executed on these accounts are operational.

Transactions have been tagged by type: cash transactions not related to securities or foreign exchange (FX) transaction settlement (“cash transactions”), cash flows related to securities transactions settlement (“securities transactions”) and cash flows related to FX transactions settlement (“FX transactions”). For the purpose of the approach, all three transaction types are considered as operational in nature and aggregated as a single transaction amount per type.

***Assumption #3: Customers with less than six months historical transactional data***

* If historical transactional data are available for more than six months: the Average Outflow is computed as the average of the number of business days in a given month outflow over a period of six months;
* If historical transactional data are available between 21 and six months: the Average Outflow is computed as the average of the business days in one month outflow over the number of days historical data are available;
* If historical transactional data are available for less than 21 business days: “core” operational deposits are set to 0 no matter the transactions/ end of day or month deposit balance.

***Assumption #4: Operational deposits***

The operational deposits amount is calculated on a monthly basis (at month-end, based on prior month data) and is assumed constant for the next 30 days.

Formulation:

Steps for calculation are set out below. The model uses a calculator, using a country specific calendar, to determine the number of days in the month and six month historical period.

The calculator is built into the FinArch application and is country specific, taking into account different national holidays during the month to calculate the total number of business days in a month, resulting in greater focus on the legal entity level. This enhancement has been made to the model September 2016 and refines and replaces the static assumption of 21 days per month and 126 days in six month period.

* Compute the total outflow by customer over the last month where *k* is number of business days in month (as calculated at the entity level as described above) and *l* the number of business days in the six month period;
* Compute the Activity Based Balance on a daily basis as the number of business days over the past 6 months (*l*) of the total outflow computed in the precedent step :
  + If a customer has more than 6 months of historical data, then the activity based balance is the average of the previous 6 months and the daily rolling 30-day outflow;
  + If a customer has between 1 and 6 months of historical data than the ABB is the average over the available period of the daily rolling 30-day outflow;
  + If a customer has less than 1 month of historical data, then the ABB is zero.

Let’s be the size of historical data for costumer ***j*** prior to day ***i*** (the number of observation of the Total Outflow for customer ***j*** before the day ***i***):

* Exclude negative balances from the data set;
* To be conservative, the daily operational balance at customer level will be the minimum of end of day balance and the ABB;
* Aggregation at entity level, to have an estimation of operational balance;
* Compute the average of the daily estimated operational balance and consider it as the operational balance:
* Note as part of the above calculation of the month end operational deposits used for the regulatory reporting, a model adjustment[[7]](#footnote-7) is applied for the final result. This is such that where the calculated operational deposit is greater than the end of month balance, the core is adjusted down. An example of this is where a client balance at the end of the month is zero. The average balance is greater than zero, however, the core cannot be more than end of month balance; therefore an adjustment is applied to the EOM computed core. Another example would be where client balances are falling day on day. The average computed balance will be greater than end of day balance, and as such will need to be adjusted down. The model adjustment will group core deposits and end of month eligible balances per entity and sector. The core deposit calculated as such is then compared to the end of month eligible balance. In case this end of month balance is exceeded by the core, the historical core deposit percentage (calculated as core divided by eligible) is applied to the end of month eligible balance. This historical percentage is calculated as the 6 month average operational deposit percentage at entity level.

1. Input Data and Data Assumptions

Input Data:

There are two kinds of input data.

* Accounts that are eligible for operational deposits
* Transactional data to feed the Model

The source of the transaction data is the International Money Management System (**“IMMS”**) system. IMMS is a multi-currency system. It contains the records for The Bank of New York Mellon, reflecting cash balances and currency positions of all clients made up of all transactions.

IMMS interfaces with our Global Securities Processing System (“GSP”) which tracks and reports on securities positions including settled and unsettled trades. IMMS receives the cash postings from other core BNYM systems where they are processed. Some of those systems are:

* GSP (Global Securities Processing) – securities trades
* ICO (Instruction Capture Online) – cash transfers
* GSF (Global STIF Funds) – STIF transactions
* DSE (Debt Service Environment) – debt service payments and outgoing wires
* MONTRAN (Money Transfer) – payments
* WSS (Wall Street Systems) – foreign exchange/money market trading
* Class Custody – BNYE securities

The model will compute the portion of core operational deposits of eligible accounts. Eligibility is determined by excluding accounts that does not satisfy to a list of criteria. Selection contains eligible operational accounts.

The result of selection of EMEA eligible operational deposit balance is stored in a table. This table contains the result of each test (criteria result) and the amount of balance at end of day. The balance of account (eligible and not eligible account) is reconciled with accounting figures.

The transactional (deals) data are measured on basis of outflow of cash account (debit of cash account). Outflow is measured daily and archived in a table.

Both datasets are imported into FinArch (“FRR”) (previously “R”) through the Brussels WareHouse (“**BWH**”).

Sources of computational data:

|  |  |
| --- | --- |
| **EU Criteria** | **Source of data** |
| Selected deposits = customer cash deposits | BWH |
| Exclude deposits | Assumptions |
| Exclude Intercompany accounts | BWH |
| Exclude Collateralized accounts | BWH |
| Exclude deposits that don’t belong to the following criteria:  clearing, custody, cash management or other comparable services | Assumptions |
| Exclude accounts with downgrade triggers | Attestation files |
| Exclude not analyzed business lines | BWH |
| Exclude funds in excess = Operational Deposit Model | FRR |
| Exclude correspondent banking relationship | Attestation file |
| Exclude hedged funds | BWH |
| Excluded price sensitive accounts | BWH |
| Excluded accounts without written agreement (Contractually binding) | Attestation file |
| Exclude new relationships (Long lasting operational) | BWH |
| Deposit be held in an account designed as an operational account | Assumption |
| Deposit balance must be empirically linked to the operational services | Assumption |

1. Calculations

The table below give an overview of the model (as at 30 June 2016) for each of the EMEA entities.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| As of 30/06/16 - €000 | | **Frankfurt branch** | **Brussels Branch** | **BNYM**  **SA/NV** | **BNYM**  **Lu** | **BNYM ltd UK (MIL & HUK)** |
| Total | Third party deposits | 1,614,872 | 20,214,113 | 24,104,690 | 4,731,675 | 2,504,146 |
| Eligible | Eligible deposits (adjusted) | 818,879 | 15,719,894 | 19,409,380 | 4,174,718 | 2,561,223 |
| Model | Operational deposits (Core) | 493,432 | 10,101,527 | 14,041,791 | 3,214,058 | 1,757,585 |
| Eligible / TTDP | 60% | 64% | 72% | 77% | 69% |
| Core/TTDP | 31% | 50% | 58% | 68% | 70% |

**Testing the Model**

1. Analysis of the Model

Result accuracy: *Back value testing – by EMEA Entity*

Set out below are the results of back testing the model, comparing the historical monthly projected Operational Deposit (“OD”) with historical daily End of the Day Balance (“EOD”).

Typically there is one month delay between the change in behavior and the time it is caught by the model. Overall the back-test shows no major breach. The result of the model illustrated above is deemed conservative.

Set out below are the results of the back testing of the model for each of the EMEA Entities.

1. *BNYMSANV (European Bank)*

*Observation:* The back-test shows no major breach.

1. *Brussels Branch of Institutional Bank(entity #297)*

*Observation:* The back-test shows no major breach.

*Observation:* The back-test shows no major breach.

1. *Frankfurt Branch of Institutional Bank(entity #276)*

*Observation:* The back-test shows no major breach.

*Observation:* When an extreme period of volatility of the outflow occurs, the balance comes down to the operational balance predicted by the model. The back-test shows no major breach. Where the end of day balance is less than the core deposit (as in 04/05/16 above) the daily core deposit balance is adjusted down using the calculation 6 month average core/total deposits x core. (A management rule[[8]](#footnote-8) is applied in the application of the reported OD balance; separate to the model adjustment)

Parameter sensitivity:

We have assessed how the model behaves to changes in parameter (i) number of month’s history (*horizon*) and (ii) periodicity.

*(i) Horizon*

A six month moving average is used in the model. The period of time used for the moving average may hide some changing tendency. Therefore, to test this assumption result obtained with different time periods was compared to the moving average (1 to 6 months). Illustrated below are the results for the EMEA entities

*Conclusion:* the selected period of time does not reveal hidden trends. Activity is stable.

*(ii) Periodicity (outflow period)*

The model uses a period of one month (number of business days in a month) to sum the outflow. In order to measure the sensitivity of the length of the period of time used to sum the outflow, some comparisons were made with periods of 2 weeks, 1 month, 6 weeks and 8 weeks. Illustrated below are the results for the EMEA entities.

*Conclusion:* the selected outflow period of time does not have a significant impact on balances.

Model fidelity (stability and behavior):

The model is designed to forecast the operational deposit for the next month. It should be stable over that period. We performed a review of historic information to check if the evolution of the model over the month is smooth or not. The following results of this testing are illustrated below

1. Operational deposit percentage
2. Eligible deposits
3. Total third party deposits
4. Core deposits
5. Total v eligible v Core – by EMEA Entity
6. Operational deposit percentage
7. Eligible deposits
8. Total Third Party Deposits
9. Core deposits

Conclusion

The model is stable and there is no visible seasonality. The “spike” observed in June 2016 in MIL and HUK relates to the UK decision to leave EU (“BREXIT”).

1. Analysis of Implementation

This section is generally reserved for automated models or those used frequently. Document implementation tests performed such as UAT, integration testing, etc.

* + Model Users

The Model will be used by the Regulatory Reporting Teams in EMEA (UK, Belgium, Germany and Luxembourg) in the preparation of the Liquidity Coverage Ratio reporting for EMEA Entities.

* + Automation

The core applications used in the model are set out below:

* Brussels WareHouse (“BWH”) – source of data and eligible accounts
* IMMS – originating source of transactional data feeding BWH
* FinArch (FRR) – application where computation and calculations are performed
  + Control Environment

Set out below are high level controls that are designed to prevent corruption of the model.

Change control

The model itself is managed by way of change control. This is governed by JIRA[[9]](#footnote-9) process and Software Lifecycle development. JIRA tool tracks the change request to model via creation of incidents (commonly referred to “tickets”) and includes an audit trail of the requestor (open ticket), the progress (tracked through) and conclusion (sign off by user). The lifecycle goes through stages of development, User Acceptance and Production release. These stages of development are signed off by the user in the JIRA platform and provide oversight and governance of the change.

Reconciliation control

The model includes a 3 way reconciliation of source data (BHW) to general ledger (PeopleSoft); this reconciliation is performed to ensure that relevant client balances are being included in the data set for computation. Reconciliation is currently performed by EMEA Regulatory Reporting Production Team. Threshold for investigation is difference > 5% of total third party deposits

Annual review of model

As a Tier 1 model, the model is independently validated by the Model Validation Team on an annual basis.

1. Ongoing Performance Monitoring Plan

The following reviews are to be performed monthly.

* *Review of input:* As described above, the model includes a reconciliation control to check the completeness and correctness of eligible accounts and end of day balance.
* *Review of output:* the resulting calculation dashboard provides a comparison of current month versus historic results; material deviances, if any, would be investigated and explained.

1. Application of management rule in the computation of the daily LCR
   * For daily monitoring of the Liquidity Coverage Ration (done 1 day in arrears), each day EOD TTPD compared against the last reported OD (core) [as calculated by model for month end reporting].  Where EOD balance is less than core the following management rule is applied to Model OD in the preparation of the Liquidity Coverage Ratio (“LCR”) reporting for EMEA Entities
   * is applied to adjust core down to core x 6 month historic core x TTPD.
   * In calculation terms if this helps with the understanding of the daily OD:

***“Daily OD ()=> if[[10]](#footnote-10) EOD TTPD() is greater than or equal to CORE (), then Daily OD () = CORE, else Daily OD () = EOD TTPD x 6 month historic core / TTPD ()”***

As a formula

** = if( min**

* + Where
* LCR = Liquidity Coverage Ratio
* EOD TTPD () = end of day total third party deposits
* CORE () = current month end operational deposit, calculated by model as reported to regulator
* Daily OD () = the operational deposit balance used in the monitoring of the daily LCR

**References for Model Documentation:** Set out below are references to supporting papers and literature.

The existing EU Model methodology is based on US LCR Operational Deposit Model developed by BNYM in United States (**“US Model”**) and approved by model validation team September 2015.

Subsequently, the US Model has been further enhanced; this enhancement was validated September 2016. The EU model is to be updated by 2Q17 to incorporate the US Model enhancements and align the models.

As there were no material changes in the model and the EMEA regulatory reporting requirements related to the operational deposits for Liquidity reporting, the supporting papers are unchanged from the initial model documentation provided September 2015.

**[Ref #1]. European Regulation regarding Eligible Accounts**

Art 27.1. “*Credit institutions shall multiply by 25% liabilities resulting from deposits that are maintained as follows: (a)by the depositor in order to obtain clearing, custody, cash management or other comparable services in the context of an established operational relationship from the credit institution*”;

Art 27.4. “*Clearing, custody, cash management or other comparable services referred to in points (a) and (d) of paragraph 1 only cover such services to the extent that they are rendered in the context of an established relationship which is critically important to the depositor. Deposits referred to in points (a), (c) and (d) of paragraph 1 shall have significant legal or operational limitations that make significant withdrawals within 30 calendar days unlikely. Funds in excess of those required for the provision of operational services shall be treated as non-operational deposits*.”

Art 27.5. “*Deposits arising out of a correspondent banking relationship or from the provision of prime brokerage services shall not be treated as an operational deposit and shall receive a 100% outflow rate*.”

**Change Log**

Track updates made to the documentation. The change log should capture what changes have been made, when, and by whom.

**Revision History of Model**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Section** | **Description of Change** | **Validation of Change** | **Validation Date** |
| 09/20/16 | All | Revised draft document to be presented to MRMG | tbc | tbc |
| 10/16/16 | Glossary of terms | Revised draft document to incorporate additional clarification on the model adjustment for end of month (EOM) (CORE v EOM) and management rule for application (CORE v EOD). | tbc | tbc |

**Access Controls**

The list of people authorized to change the model listed below

* + Nadeem Aslam, EMEA Regulatory Reporting Policy
  + Vanessa De Koker, Head of Belgium Regulatory Reporting
  + Guy Grundy, EMEA Liquidity Reporting Production Manager
  + Nele Matthys, EMEA Controllers Change Manager

Additional people authorized to change the model will be determined later as needs of the business requires.

**Glossary of terms used in the document**

|  |  |
| --- | --- |
| **Term** | **Description** |
| ABB | Activity Based Balance |
| ALCO | Asset & Liability Committee |
| BS | Balance sheet |
| BWH | Brussels Data Warehouse |
| C73.00 | LCR report – “C 73.00– OUTFLOWS” |
| Core Deposit | Minimum deposits required to support clients' operational activities; estimated value based on ABB model |
| Eligible Deposit | Eligible spot deposit balances |
| EOD | End of Day |
| EOM | End of Month |
| Excess | Excess deposit balances, not used for operational requirements |
| IMMS | International Money Management System |
| ODM | Operational Deposits Model |
| PS | PeopleSoft - Global PeopleSoft Financials is the enterprise platform for maintaining most of BNY Mellon’s key financial transactions and records within a uniform control environment |
| TTPD | Total Third Party Deposits |
| Model adjustment | Calculation used in the calculation of model output where the month end core balance (operational deposits) is greater than the end of month (EOM) balance. |
| Management rule | Calculation used in the application of the model output where the month end core balance (operational deposits) falls below the daily end of day (EOD) balance.  Where EOD balance < CORE, CORE is revised down to be equal to EOD x 6month historic CORE/TTPD (%). Note where EOD balance is greater than or equal |

1. EU Regulation N° 575/2013, OJ 27.06.2013, L176/1. [↑](#footnote-ref-1)
2. The calculation is performed at the customer level rather than at the account level, since customers may have multiple accounts to facilitate their operational requirements (ex: one account in EUR and one in USD). Also, customers may have accounts which fall under a cash management agreement with a right of offset and/or manage their aggregate pool of funds between multiple accounts. Furthermore, the regulation requires assessing the established relationship with the depositor (EU Delegated Act, Article 27.1), not at account level. [↑](#footnote-ref-2)
3. Article 27.1. “*Credit institutions shall multiply by 25% liabilities resulting from deposits that are maintained as follows: (a) by the depositor in order to obtain clearing, custody, cash management or other comparable services in the context of an established operational relationship from the credit institution*”. [↑](#footnote-ref-3)
4. EU Regulation N° 575/2013, OJ 27.06.2013, L176/1. [↑](#footnote-ref-4)
5. EU Regulation N° 575/2013, OJ 27.06.2013, L176/1. [↑](#footnote-ref-5)
6. The calculation is performed at the customer level rather than at the account level, since customers may have multiple accounts to facilitate their operational requirements (ex: one account in EUR and one in USD). Also, customers may have accounts which fall under a cash management agreement with a right of offset and/or manage their aggregate pool of funds between multiple accounts. Furthermore, the regulation requires assessing the established relationship with the depositor (EU Delegated Act, Article 27.1), not at account level. [↑](#footnote-ref-6)
7. See glossary of terms for note on model adjustment [↑](#footnote-ref-7)
8. See glossary of terms for management rule. [↑](#footnote-ref-8)
9. JIRA is an incident tracking portal: <https://jira14.bnymellon.net/> [↑](#footnote-ref-9)
10. Note that first rule in statement is “if (t >=c“ – therefore only apply the management rule (6 month historic rate %) where TTPD is less than Core [↑](#footnote-ref-10)