



RMB / MXPRESS

**PH3C - SCOPING DOCUMENT**

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# I Introduction

MXpress is a global initiative at Murex which aims at reducing the cost of project implementation/extension while increasing the quality of the configuration, by providing a repository of pre-packaged configurations (MXpress foundation) and an accelerated process of delivery (MXpress implementation methodology). After having implemented the MX.3 platform for banks and financial institutions around the world using MXpress, in 2011 Murex started to enhance the initiative by elaborating a series of business solutions, based on the most common practices shared by most of the clients. These best practices rely on the business processes illustrated in Figure I: MXpress Reference Business Solution.

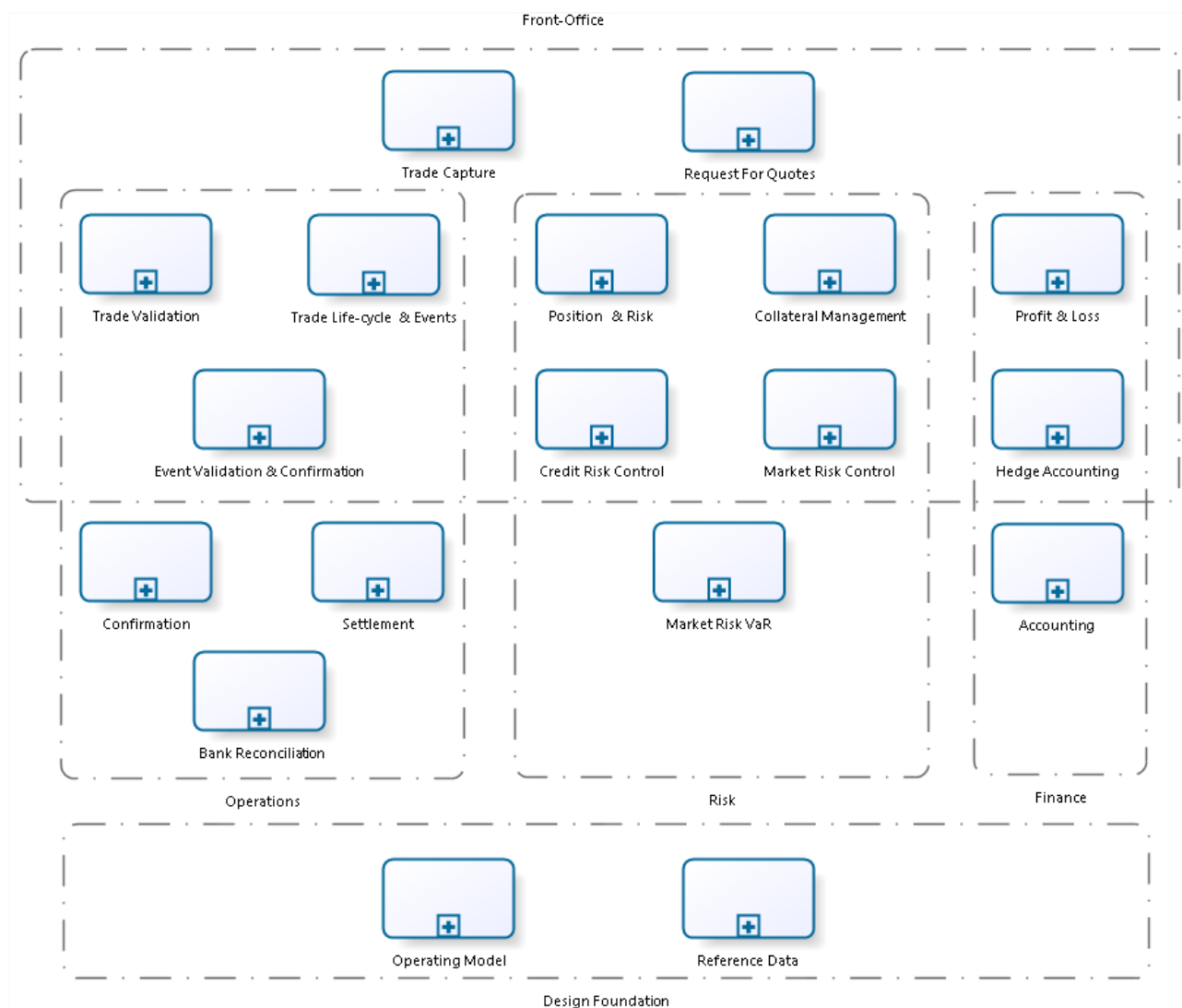


Figure I: MXpress Reference Business Solution

This document is intended to help the project team define the project scope and to get a good understanding of the implementation / extension complexity.

## 2 Operating Model

The following flow chart provides a high-level view of the Operating Model.

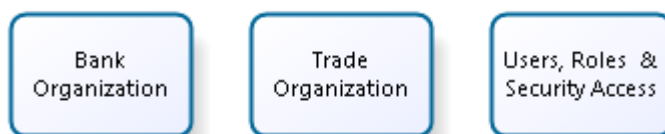


Figure 2: Flow chart of the Operating Model

### 2.1 Bank Organization

#### 2.1.1 Office Locations

Classifying the physical locations of the bank's main office and its subsidiaries provides useful information on the time constraints during which the activity in scope starts and ends, on the jurisdictions and regulation under which the bank runs, its accounting and non-risky currencies ...

S\_2.1.1: The office locations in the scope of PH3c are South Africa and London

#### 2.1.2 Legal Entities

Across the different locations, the Bank would have subsidiaries and/or branches. A branch office is not a separate legal entity of the parent legal entity while subsidiaries correspond to different legal entities. These subsidiary and branch entities are accessed from end users from different locations.

Legal entities drive confirmation instructions and signature, settlement instructions, tax authority selection and tax regulations. Coordinates of the legal entity will be given to the external world, such as in confirmations, settlement instructions.

S\_2.1.2: The below list of CE will have funding and hedge accounting on MX for Ph3c.

#### **ES.AUSTRALIA**

##### **RMB AUST**

OE.RMB AUST

#### **ES.FRSECURITIES**

##### **FR SECURTS**

OE.FRSECURITIES

#### **ES.LONDON**

##### **FRB LONDON**

OE.FRB LTD-LND

OE.RMB LONDON

#### **ES.PBCLIENTS**

##### **PB CLIENTS**

ACUMEN

CORONATION

DISCOVERY

FAIRTREE

INDEPENDANT ALT

KADD

MATRIX  
SANLAM  
SOUTHCHEST  
SOUTHEASTER  
TANTALUM  
TEREBINTH  
TRINOMIAL

#### **ES.RMB\_FC**

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##### **RMB FC**

OE.RMB\_FC

#### **ES.SOUTHAFRICA**

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##### **FR LTD**

OE.FR LTD SA  
OE.FR ST INS  
OE.FRB INV HLD  
OE.FRL LTD  
OE.RMB ASST FIN  
OE.RMB INV&ADV

##### **FR SECURTZ**

OE.FR AUTOREC  
OE.NITROSEC

##### **FRB LTD SA**

OE.FRB LTD  
OE.RMB SA

##### **RMB AFF**

OE.MORGANSTAN  
OE.RMB STK OP  
OE.RMBSEC

##### **RMB SPVS**

OE.BERGG CREDIT  
OE.FR FIN COM  
OE.FRESCO  
OE.INDWA INV  
OE.INGUZA INV  
OE.INKOTHAINV  
OE.INTERPRF INV  
OE.IVUSI INV  
OE.MAKLNI HLDGS  
OE.MERBND  
OE.PRC LEXSHL  
OE.RAKEVEST  
OE.RMB PRPHLDC1  
OE.RMB PRPHLDC2  
OE.RMB PRPHLDC3  
OE.RMB.AFGRI  
OE.SYZIGUM TD

S\_2.1.3: further clarifications:

- **Ashburton** will only have funding transactions for Ph3c live on MX.
- **RMB-FC** will remain as a separate closing entity as opposed to becoming an operating entity under RMB AFF
- For **RMB AFF**, **FR SECURTZ** and **RMB SPVS**: only funding instruments (possibly limited only to ZAR) will be taken live on MX for Ph3c
- **RMB Australia**: Assumption is that RMB Australia closing entity has a legacy book (ie no new activity), rather existing trades waiting to mature **or being rolled**. This closing entity is handled from south Africa (no human presence in Australia). Assumption also is that there are no requirements for risk generation for Australia as part of Ph3c (per current design in production).

### 2.1.3 Business Activities

Banks tend to split their business into several activities such as capital markets and treasury along with other businesses such as retail banking, corporate banking...

#### Market data across departments

S\_2.1.4: The following market data sets are currently being used in production:

1. **FO\_MDS** (MDS), **FO\_MDS\_VOL** (MDS) à front office, used by Trading desks to price and monitor intra-day risk and P&L
  - Connected to MAIN rate curve assignment template
  - Connected to MAIN collateral assignment template
2. **CLOSING\_MDS** (C\_MD) à official market data set, used to generate official P&L statements; data copied from **VAR\_RW\_MDS** daily
  - Connected to RW rate curve assignment template
  - Connected to MAIN collateral assignment template
3. **VAR\_RW\_MDS** (VAR\_RW\_MDS) à market risk, used to compute internal and regulatory enterprise market risk; data imported from ARP daily
  - Connected to RW rate curve assignment template
  - Connected to MAIN collateral assignment template
4. **FO\_TLI** (TLI) à RiskTool, used to mimic Calypso rate curves; data imported from Cache daily
  - Connected to TLI rate curve assignment template
  - Connected to MAIN collateral assignment template
5. **COLL\_MDS** (COL\_MDS) à collateral management, used to compute exposure and collateral balance for bilateral VM
  - Connected to RW rate curve assignment template
  - Connected to MAIN collateral assignment template
6. **BIM\_MDS** (BIM\_MDS), à collateral management, used to compute exposure and collateral balance for bilateral IM
  - Connected to RW rate curve assignment template
  - Connected to MAIN collateral assignment template
7. **CLOSING\_MDS\_IND** (C\_MD\_IND) à OBSOLETE, to be deleted in PROD after submitting to support
  - Connected to MAIN rate curve assignment template
  - Connected to MAIN collateral assignment template

S\_2.1.5: Assumption is that it is not foreseen to create any specifically new MDS for Ph3c. Traders for Ph3c will be using FO\_MDS.

As a note, FO\_TLI will be decommissioned by the PAR Risk project.

## 2.1.4 Departments

To support the different business activities, the following departments are identified (though the organization might vary from one bank to another): front-office, middle-office, group risk, finance, operations as well as support

### 2.1.4.1 Front-office department

#### **General**

S\_2.1.6: No new legal entities or processing areas are needed to be created for PH3c.

S\_2.1.7: Only London and Johannesburg timezones are to be considered for PH3c.

#### **Group Treasury**

S\_2.1.8: GTSY will continue using KRM as the central ALM/Liquidity management system in PH3c. MX will continue being a source feeding into KRM for LCR, NSFR,..., Liquidity aggregation across group. GTSY will hence not need to manage on MX:

- IR risk from divisions within FirstRand group that are not live on MX (such as retail activity, IBD, Corporate Bank, ...) as IBD and Corporate bank (portion of business currently capture on RMB systems) will be on Murex for PH3, and their IR position will be transferred to GTSY in Murex using funding trades.
- The bank's global liquidity position and liquidity risk management.
- However, there is a need to import cash balances for funding computation purposes only, not for IR risk or liquidity risk management on MX. The need is to import CFC balances from RAS/Hogan/FEDS for funding. There is a current process in Calypso that brings these balances for funding.

S\_2.1.9: SA GTSY will not monitor intra-day/EOD nostro cash balances in MX. In other words, assumption is that SA GTSY will not need to use the nostro cash module of MX (FEDS being the nostro cash system of GTSY used to monitor nostro cash accounts and reconciled against bank statements).

However for London, the nostro cash is in Integra-T today and needs to be replaced by MX. Assumption for SOW would be to include the nostro cash in scope for London. Simultaneously London will explore feasibility to migrate to FEDS (or its replacement if it is available pre P3b go live).

#### **IBD and Corporate Bank**

S\_2.1.10: IBD will continue sending risk free cash flows for loans or flows not on Murex for funding purposes.

### 2.1.4.2 Operations department

This activity corresponds to the 'Processing' activities such as validation of trades, confirmation of trades, settlement or payment validation.

Other activities of the operations department usually include the capture and validation of non-economic static data such as counterparties, SSIs and legal agreements as well as the processing of margin calls (notification documents, dispute management, reconciliation, substitution of collateral...)

S\_2.1.11: Same Ops team in GM will handle the settlement of cash flow sent to MX for settlement and funding.



### 2.1.4.3 Group Risk department

Enterprise market risk is already live on MX.3.

S\_2.1.12: Credit risk is assumed to remain on ELMS instance for Ph3c.

### 2.1.4.4 Finance department

Finance activity is related to accounting, publication of official P&L and some computation related to prudent valuation. Finance has in charge acceptance of transactions reported in the official P&L (incl. closedown of trading) and the adjustment reserves as well as the reconciliation between reporting/sub-ledgers and the general ledger (GL)

The finance department is made of three main teams:

- Product control book runners
- Accounting
- Prudent valuation (IPV)/valuation control

#### Accounting

Accounting is responsible for publishing the accounting business events and accounting chart of accounts. Its main activities consist of:

- Monitoring and validation of generated accounting entries and account balances
- Capture of adjustments/reserves depending on the IT landscape
- Publication of bank's accounting statements
- And depending on the IT landscape, reconciliation between reporting/subledger and the general ledger (GL)

S\_2.1.13: The current Hedge accounting process uses valuations from source systems, computed using official EOD market data.

## 2.2 Users, Roles & Security Access

End users access the platform with a certain user profile. The user profile is defined as user groups and a user can belong to more than one user group.

S\_2.2.1: Assumption is that Murex only provides a sample of groups from every concerned department requiring to support the delivered functionalities, RMB would be responsible for configuring the exhaustive list of user groups with associated rights (portfolios, counterparties, menus, products, events etc...).



## 3 Product hierarchy

### 3.1 Traded products

S\_3.1.1: As far as the process to produce market risk on **MARGIN** balances is concerned on Ph3c, assumption is that solution provided in production will be modified (export margin balances and import as SCFs part of EOD), and SCFs will be automatically inserted by MX upon every collateral allocation and collateral interest payment generation. This SCF would be used for both funding and risk computation (but not settlement nor accounting which will be affected from the initiating collateral object)

S\_3.1.2: Following is the list of systems that will be partially decommissioned on Ph3c:

- Chameleon

## 4 Operations department

### 4.1 Settlement

The following flow chart provides a high-level view of the Settlement business process.



Figure 3: Flow chart of Settlement business process

S\_4.1.1: It is no longer needed to generate internal payments in MX for funding purposes except for dividend payments (need to be kept for subledger accounting purposes).

S\_4.1.2: Assumption is that products booked outside MX will start settling on MX by Ph3c since Funding is moved from Chameleon to MX. The SCF sent to Murex will be used for settlement. With the only exception being IBD that will continue settling on Calypso for some time after Ph3c is live.

Systems scope: The cash flows could originate from any trades on any trading system that will not be in scope for the project. The systems are currently the following ones:

- Exotic trades dealt on Exception handler or ETS
- Loans from IBD's ACBS system
- Osiris - commodity physicals
- Chameleon CDS – customer dealing
- Finesse - Equity options and structures
- Journals portal - accounting events cashflows
- GCMS – futures clearing

S\_4.1.3: Below are the assumptions related to the trades on systems that will start settling on MX as part of Ph3c:

- Volumes: about 400 settlements per day.
- Flow type: only cash flows. No security flows in the scope. No commodity flows.
- Representation required in MX: These payments will be inserted in MX.3 as simple cash flows trade connected to a portfolio, but without any related economic details of the trades that resulted in the cashflow. A reference ID of the related transaction, typology of the related transaction and also a unique source system reference are needed to be available in the cashflow in order to be able to identify where the cashflow has come from.
- SSIs: Will be maintained in MX.3 and will be selected based on the currency and counterparty
- Trade process: No validation process is required and no amendment can be done on these trades. If corrections are needed, they will be done in the external systems and new cashflow trade will be imported.
- Payment process: these payments will be processed as standard payment and will be released at release date even if the related SCF deals are imported into MX.3 prior to the release date.
- In case of Multiple accounts exception, the user will manually select the proper account in MX.3 based on the comment added in the SCF trade.
- If no SSIs are set up then the cash flow will not process and will appear on the ops team dashboard to correct an process.
- Once the payment is released MX.3 should send a status update to the source system. This will apply to any source system where trades are not in MX.3.
- Settlement messages to be used for those trades are listed in the table in section 5.4.4 (type Cash)

#### 4.1.1 Process Initiation

Any security, commodity or cash flow generated in the MX.3 platform (as a consequence of a trade booking or an event - in particular a fixing event) is eligible to be included the Settlement process.

However, these flows are only processed automatically when their release date is within the two coming working days and the trade from which they are issued is matched

Exceptionally the processing of the flows can be manually initiated.

S\_4.1.4: Process applied for Ph3 settlements:

- Initiate automatically when the release date is within two business days
- Manual initiation is allowed

#### 4.1.2 Instruction Generation

Actual Instructions are automatically generated from validated flows, after netting when applicable.

Netting eligibility is determined on the basis of predefined business rules and agreements with the beneficiary party. Even if flows are eligible to be netted into one instruction, the user Settlement can choose to instruct some of them independently (one Instruction by flow).

S\_4.1.5: Netting agreement with Counterparties or Clients are present. To be discussed more in details during design.

#### 4.1.3 Instruction Checks

Generated Instructions go through another series of checks to detect potential exceptions that could affect the settlement itself. If an Instruction fails at least one check, an exception is raised for the user Settlement to intervene and take the appropriate action.

S\_4.1.6: Current production instruction checks are:

- Missing Settlement Instructions (SSI)
- Multiple Settlement Instructions
- SSIs are customized
- Back Value date
- Sensitive counterpart
- Payments having a payment date after Currency cut offs (check before the release of the payment)

All above checks are needed for Ph3c settlements.

S\_4.1.7: Modification of payment value date requires 4-eyes validation as per current process.

#### 4.1.4 Instruction Release

Validated instructions will automatically generate messages where applicable.

SWIFT messages are automatically generated by the MX.3 platform from validated Instructions. Through a dedicated OSP, the user Settlement is then asked to validate all the SWIFT messages before they are released to the actor "SWIFT Gateway".

S\_4.1.8: Below is the list of SWIFT Payment messages in scope of Ph3c.

Settlement	Type	Description
MT103	Cash	Single customer credit transfer
MT202	Cash	Notice to Pay
MT210	Cash	Notice to Receive
MT200	Cash	Cash Transfer when custodian=nostro
MT192	Cash	Cancellation for MT1XX
MT292	Cash	Cancellation for MT2XX
MT202COV	Cash	Used with MT103 when necessary
MT900/MT910	Cash	Rand payments for FRB clients
SMART	Cash	SMART message format
ISO	Cash	ISO message format
Settlement advice	PDF	Similar to IB

S\_4.1.9: Following are some assumptions related to out of scope payment messages

- VODS is out of scope for Ph3c products.
- MERVAMT103/202/210 are out of scope.

#### 4.1.5 Instruction Status

S\_4.1.10: In the current process, following the release of the payment message from MX, and the receipt of the corresponding Ack, MX sends a copy of the released payment for funding and nostro update with Ack/Nack communication in place. Funding will take place in gross mode.

It is confirmed that the same post release process for Ph3c activity will apply, except that there's no more need to send funding messages

## 4.2 Cash and security inventories

Right from their generation, cash or securities flows are feeding inventories to monitor the position of Nostro accounts.

S\_4.2.1: SA GTSY will not monitor intra-day/EOD nostro cash balances in MX. In other words, assumption is that SA GTSY will not need to use the nostro cash module of MX (FEDS being the nostro cash system of GTSY used to monitor nostro cash accounts and reconciled against bank statements).

However for London, the nostro cash is in Integra-T today and needs to be replaced by MX. Assumption for SOW would be to include the nostro cash in scope for London. Simultaneously London will explore feasibility to migrate to FEDS (or its replacement if it is available pre Ph3c go live).

Assumption also in SOW is that MX needs to generate MT940 and MT950 statements and send to intellimatch for reconciliation purposes against nostro agent daily. This is logged under the interfaces list.

## 5 Finance department

### 5.1 Accounting

The following flow chart provides a high-level view of the Accounting business process.



Figure 4: Flow chart of Accounting business process

All financial contracts, fungible instrument positions and hedge instruments available in the MX.3 database provide financial events to the MX.3 accounting engine during their life cycle.

#### 5.1.1 Accounting Generation

MX.3 accounting engine interprets financial events originating from the financial contracts, fungible instruments positions or hedges, to generate accounting entries according to a predefined accounting schema. Generated accounting entries are stored in MX.3 that acts as a sub-ledger.

##### General accounting process

S\_5.1.1: In the event where settlement will be done on MX for non-MX trades, the settlement accounting would be designed as follows:

- Cash event in originating system to post Cash Sett control account vs PnL
- Settlement in Murex to post Nostro vs Assumed to Actual
- SCF trade in Murex to post Assumed to Actual vs Cash Sett control account

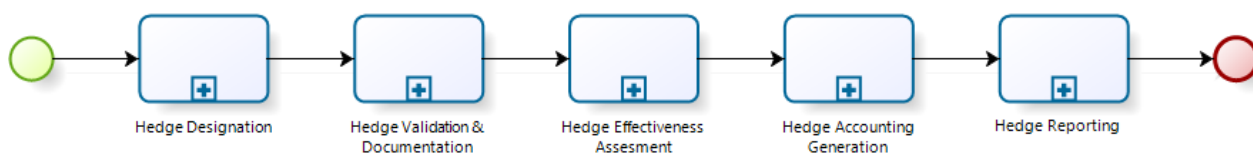
#### 5.1.2 Accounting Data Processing

MX.3 accounting sub-ledger data is accessed and processed by User Finance: either internally within MX.3 through available accounting data outputs, or externally through extractions that feed external systems such as the General Ledger.

S\_5.1.2: For Accounting Data Processing, it is assumed that there is no need for additional reporting for this phase. Reporting needs from subledger are to be defined in the reporting phase of the Murex Subledger design and implementation.

### 5.2 Hedge Accounting

The following flow chart provides a high-level view of the Hedge Accounting business process.



*Figure 5: Flow chart of Hedge Accounting business process*

<p>S_5.2.1: GTSY Finance is responsible for the hedge accounting business process</p> <p>S_5.2.2: Hedge accounting is currently in use at RMB. Hedge effectiveness is calculated through spreadsheets and a database monthly. Manual accounting entries are keyed in the GL today to reflect the HA impact</p> <p>S_5.2.3: If hedge accounting was to become live on MX for Ph3c but subledger not yet live on PH3, Hedge accounting events will be fed to the General Ledger. There is no need for a RADA BE for HA. Team will rely on a report to be able to manually upload relevant entries on GL.</p> <p>S_5.2.4: Accounting standards used in the context of hedge accounting are IFRS 9 for micro hedges and IAS 39 for macro hedges.</p> <p>S_5.2.5: The steps described in the diagram do fit with RMB way of handling Hedge Accounting</p> <p>S_5.2.6: All steps of hedge accounting are expected to be performed on MX.3. Documentation needs to be done outside of Murex but suggest that this then be imported in Murex to ensure end-to-end Hedge Accounting. Assumption is that existing hedge relationship documents will be uploaded on MX part of the migration. Assumption is also that OTB documentation will not be used in MX. RMB will want to generate the hedge documents outside MX, and attach them to the hedge relationship on MX once done.</p> <p>S_5.2.7: Whenever an amendment needs to happen on a swap within a micro hedge relationship, there needs to be a validation step to be done by GTSY Finance. For macro hedging relationships, there is no need for this validation because those relationships are meant to change regularly. Demarcation methodology between Micro and Macro hedge relationships is yet to be tackled in design.</p>
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### 5.2.1 Hedge Designation

In this step, User Hedge Designator will designate hedge relationships between hedged items and hedging instruments available and capture them in MX.3 platform. To ensure compliance with international standards, hedge relationships are captured based on pre-defined hedge strategy templates that define the hedge type, the hedged items, the hedging instruments and the designated risk. Following the selection of the desired Hedge strategy, automated matching of critical terms between hedged item and hedging instrument is performed at the time of the capture as a to ensure prospective effectiveness of the Hedge.

S\_5.2.8: GTSY Front-Office will book hedged items and hedging instruments but Quant/Risk (Elzette Young) in GTSY perform hedge designation after confirmation from GTSY Finance (Rakhi Bhagwan). The intention for the Group is to manage Hedge Accounting centrally, particularly for off-set benefits.

S\_5.2.9: "Hedge Strategies Scoping.xlsx" file details existing hedge strategies:

- Designated Risks:
  - FX risk was requested in the past. Not used currently in production, however might be needed in the future. Assumption is that FX risk designated hedges are considered to be as out of scope for now in the absence of business requirements, until further requirements are discussed in design / in the future, where we will need to reassess ability and effort to cover the need.
  - Equity risk: TRS hedging the delta of share options, to be tackled further in design phase.
  - It was stated in the past that RMB had a high priority to implement hedge accounting for inflation risk. Not used currently in production, however might be needed in the future.



Assumption is that inflation risk designated hedges are considered to be as out of scope for now in the absence of business requirements, until further requirements are discussed in design / in the future, where we will need to reassess ability and effort to cover the need.

- Hedge type:
  - o Fair Value Hedge
  - o Cash Flow Hedge
  - o Net Investment Hedge: This is assumed to be out of scope for Ph3c.
  - o Macro-hedge: Currently have a single macro-hedge (MotoNovo), which will unwind. May potentially be required depending on Murex's capabilities. This is to be tackled in the demo and working session on hedge accounting to take place with RMB. For the moment assumption for SOW is that macro hedge is out of scope.
- Hedging instrument types: Swaps, FRAs, TRS
- Number of live relationships
  - o Fair Value Hedge: +-25
  - o Cash Flow Hedge: -300

In the current MX version, it is not possible to compute VAR on clean FV: In the context of hedge accounting, assumption is that VAR module will compute a dirty FV that will be used in the prospective hedge effectiveness computation. To note that clean FV computation will be natively possible in higher MX versions (release 42 and up).

Methodology of prospective effectiveness testing used by RMB is to be tackled further in details within the demo and working session on hedge accounting to take place with RMB.

S\_5.2.10: Partial tenor hedge relationship designation is required

*e.g. hedging instruments that hedge only part of the hedged item maturity (i.e. swap 5y hedging a 10Y bond)*

S\_5.2.11: Relationships designation using modelled hedged items to optimize hedge effectiveness measurement is needed. At present, the credit spread is isolated from the other MTM components to be hedged, i.e. interest rate risk at present

S\_5.2.12: Modelled hedged items are used to calculate the reserve amount and ineffectiveness based on the cumulative clean MTM change in the hedging instrument and the hypothetical derivative (instrument that measures the hedged risk).

Hypothetical derivative is used in CF hedge to compute reserve amount.

For FV hedge, a bond with a Cst spread + specific curve is used.

S\_5.2.13: Hedge relationships are currently done on a position only for SOAFs, 30-Yr Bond, USD denominated Govi Bonds and at a trade level, i.e Cashflow vs Fair Value

- CashFlow hedges are done at trade level
- FV hedges could be done by deal or at position level

S\_5.2.14: Hedge relationships with several hedged items and several hedging instruments can be designated.

S\_5.2.15: A given hedge or a hedging item can be allocated between multiple hedges. Could be either nominal based or tenor based split

S\_5.2.16: It is confirmed that Market value adjustments are required for hedge designation in the case of Late hedge or intraday drift. For example: AFS reserve as at designation date needs to be amortized (Effective interest rate) till maturity

### 5.2.2 Hedge Validation & Documentation

In this step, User Hedge Controller will control and validate Hedges captured by User Hedge Designator, mainly the result of the critical terms matching and the prospective and retrospective effectiveness tests. Incorrect hedges will be sent back to User Hedge Insertion for verification. Correct hedges will be validated and produce the consequent hedge documentation. Hedge documentations will be reviewed by User Hedge Controller, and edited if necessary before release for archiving and printing purposes.

S\_5.2.17: GTSY Month-end Finance with GTSY Quants Team are responsible for hedge validation

Validators govern the process of modifying and cancelling designated hedges given the impact on accounting and disclosure, however cannot modify or cancel the hedging instruments or items - this function vests with Front-Office post validator approval.

GTSY will only instruct FO team to do the booking and modification

The critical terms to be matched between the hedged/hedging items are Maturity date and nominal

S\_5.2.18: Initial Prospective effectiveness method is not required

Prospective effectiveness test is needed on every month end and should consist of an inception to month end scenario for every hedge inserted during the concerned month.

S\_5.2.19: Hedge documentation is generated (outside MX) and is published into a shared drive for archival. This process happens outside MX.

### 5.2.3 Hedge Effectiveness Assessment

In this step, validated hedges will be assessed daily for retrospective effectiveness in order to validate their qualification for Hedge Accounting. Daily Hedge effectiveness assessment will performed on captured Hedges as part of the End-Of Day process using Fair value variations calculated automatically on hedged items and hedging instruments, and produce the assessment results based on the test method defined at Hedge level. User Hedge Controller will monitor assessment results and de-designate manually ineffective Hedge relationships when necessary.

S\_5.2.20: GTSY is responsible for monitoring hedge effectiveness in the current organization

- De-designation on existing hedge relationships can happen in case of failure, only prospectively. Or also trade terminations, trade compressions.
- The amortization method used upon de-designation is Linear. Over the remaining life of the hedge relationship
- The amortization is required over the remaining life of the hedged item. if hedged item is sold, all is release in PL (no amortization)
- The frequency of the prospective effectiveness assessment is done monthly using daily observation points.
- Retrospective effectiveness assessment is only applicable in the context of macro hedging
- Regression analysis is used for prospective effectiveness assessment

S\_5.2.21: Rebalancing might be needed, to be re-confirm in the design. Today there is full de-designation and re-designation that takes place.

S\_5.2.22: Events/Modifications can be performed on the underlying hedged items/hedging instruments in line with modifications as per IFRS9.

### 5.2.4 Hedge Accounting Generation

In this step, MX.3 accounting engine processes all validated Hedges to generate Hedge accounting entries. Generated accounting entries will be the result of the interpretation of the financial events of the existing hedges, depending on the hedge type, FVH or CFH, or the hedge status, effective or ineffective and de-designated.

S\_5.2.23: Currently there is no specific hedge accounting schema. hedge accounting treatment will be embedded in the existing Murex Subledger accounting schemas and discerned via the accounting classification (Cashflow Hedge and Fair Value)

This would be revisited after the implementation of the hedge accounting module in MX.3

S\_5.2.24: In terms of the list of accounting events expected to be generated in MX Subledger, Accounting entries are needed to route between the reserve account and Balance Sheet Derivative and PNL predicated on the hedge being effective or ineffective.

S\_5.2.25: The need is to generate a report of hedge accounting entries to be hosted in the ORACLE GL. Requirements for the reporting will be tackled in the design sessions. Assumption for now is that OTB reports are sufficient. Otherwise, it will be addressed as a CR later.

### 5.2.5 Hedge Reporting

In this step, all users can monitor hedge accounting activity either through monitoring outputs available in MX.3 or through pre-packaged reports. Monitoring will cover all proceeding steps of the process: Hedge designation and measurement, Hedge effectiveness assessment, Hedge accounting entries.

S\_5.2.26: Following is the list of the Hedge reports that need to be produced by MX:

- Hedge Designation & Hedge Measurement report
  - o All live hedges with their characteristics and cumulated FV adjustment
  - o Monthly report
- Hedge Effectiveness report
  - o All live hedges effectiveness measurement results
  - o Monthly report
- Hedge accounting reporting
  - o All journal entries produced on Live Hedges

The above would need to be produced at a minimum. However more reports would result in value-add for analysis purposes such as quantification of sources of ineffectiveness or other analytic type reports if possible. These reports will be tackled in the reporting design sessions.

## 6 Group risk department

### 6.1 Credit Risk Control

The following flow chart provides a high level view of the Credit Risk Control business process.

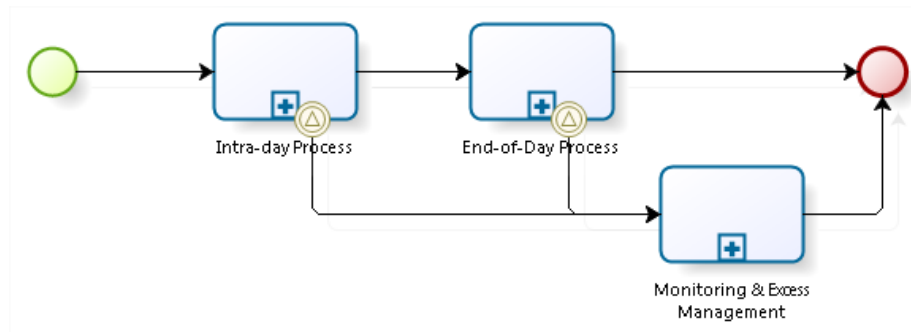


Figure 6: Flow chart of Credit Risk Control business process

S\_6.1.1: Credit risk control is out of scope

### 6.2 Enterprise Market Risk

The following flow chart provides a high level view of the Market Risk - VaR business process.

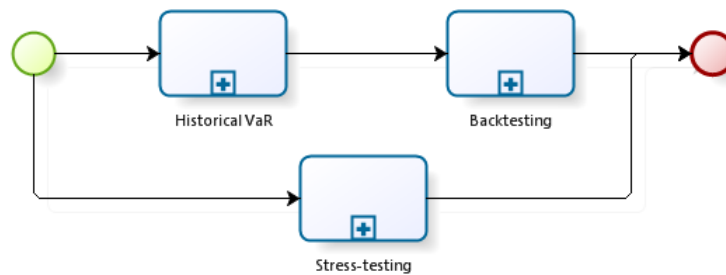


Figure 7: Flow chart of Market Risk VaR business process

S\_6.2.1: All enterprise market risk measures are calculated based on Market Value + Future Cash and ignore any past cash at trade level. This design is not expected to change during this phase and we will continue to have same past cash treatment for all market risk measures, despite the fact that funding will become live on MX.

Further considerations to be discussed during design (namely change in representation of funding trades now that funding is live on MX). Assumption for SOW is that past cash within official risk results will not be considered at this stage.

S\_6.2.2: All current production market risk processes are expected to remain as is with this phase.

## 7 Transversal processes

### 7.1 Collateral Management

S\_7.1.1: SCFs need to be auto-booked for every margin call allocation and interest receipt/payment, in order to materialize a cash balance subject to funding and risk computation.

### 7.2 XVA

#### 7.2.1 Introduction

S\_7.2.1: Same process assumed to remain the same on this phase:

- MX sends to Compatibl Ph3c OTC trades in real time, and full trade population by EOD.
- Compatibl would compute xVA and would send a SCF onto the portfolio on MX.

### 7.3 Transfer pricing

#### 7.3.1 Liquidity transfer pricing

##### **RMB funding process scoping**

S\_7.3.1: From funding perspective, entities in MX subject to funding computation can be split into four categories:

1. **Treasury departments (GTSY):** treasury departments will use Murex as its core funding engine for RMB business activities, including management and execution of the daily FTP funding process defined in this document, position keeping on the liquidity mismatch portfolios and accessing external liquidity via its own Mx front office portfolios. Murex will support two GTSY departments: GTSY ZA and GTSY London Branch.
2. **Entities funded by GTSY:** These are RMB business units – GM, IBD and Corporate Bank – operating under FirstRand Bank Ltd banking license. These entities have direct access to the funding from GTSY. Their business activities will be funded in Murex automatically using the FTP funding processes defined in this document.
3. **Self-funded FirstRand entities:** These include FirstRand entities legally outside of FirstRand Bank Ltd (individual entities in this group are listed later in this chapter). Some of these will have a portfolio in Murex but will not be funded using the Murex automatic FTP process as they manage their own funding needs. The entities may request funding from GTSY on ad hoc basis and this will be facilitated via external funding trade between the entity and GTSY front office portfolio. GTSY front office portfolio will be funded automatically in Murex against the GTSY mismatch portfolios in funding book.
4. **Brokerage clients:** brokerage clients, portfolio of which is administered by RMB. These include Prime Broking and RMB Morgan Stanley clients. These clients will have portfolios set-up in Murex to keep record of their positions. These portfolios will not be funded in Murex using automatic FTP process. Clients will self-fund by either depositing their own funds in RMB, or by sourcing funding from RMB using approved credit line. Once sourced these funds will be reflected on client portfolio in Murex, as well as on RMB business portfolio that will hold these funds as client deposit.

The table below shows entities that will have portfolio in Murex and their categorization. Only 'Treasury' departments and 'Entities funded by GTSY' will have automatic funding processes in Mx enabled. Self-funded FR entities and Self-funded brokerage clients will have automatic funding process disabled on their portfolios as they will fund manually on ad hoc basis either externally, or from one of the entities funded by GTSY!

Geography	Treasury	Entities funded by GTSY	Self-funded FR entities	Self-funded brokerage clients
London branch	FR Bank - London GTSY (OE.FRB LTD-LND)	FRB - IBD (OE.RMB LONDON)	FirstRand Securities (OE.FRSECURITIES)	
		FRB - GM (OE.RMB LONDON)		
		FRB - GTSY FO (OE.FRB LTD-LND)		
South Africa	FR Bank - SA GTSY (OE.FRB LTD)	FRB - CB SA (OE.RMB SA)	RMB AUST (ES.RMB.AUST)	PB Clients (ES.PBCLIENTS):
		FRB - IBD SA (OE.RMB SA)	RMB Futures Clearing (ES.RMB.FC)	ACUMEN
		FRB - GM SA (OE.RMB SA)	Ashburton	CORONATION
		FRB - GTSY FO (OE.FRB LTD)	OE.ASHCISMCO	DISCOVERY
			OE.ASHFNDMAN	FAIRTREE
			OE.ASHMANCO	INDEPENDANT ALT
			OE.ASHMULTISS	KADD
			FR LTD:	MATRIX
			OE.FR LTD SA	SANLAM
			OE.FR ST INS	SOUTHCHEST
			OE.FRB INV HLD	SOUTHEASTER
			OE.FRL LTD	TANTALUM
			OE.RMB ASST FIN	TEREBINTH
			OE.RMB INV&ADV	TRINOMIAL
			FR SECURTZ	
			OE.FR AUTOREC	
			OE.NITROSEC	
			RMB AFF	
			OE.MORGANSTAN	
			OE.RMB STK OP	
			OE.RMBSEC	
			RMB SPVs	
			OE.BERGG CREDIT	
			OE.FR FIN COM	
			OE.FRESCO	
			OE.INDWA INV	
			OE.INGUZA INV	
			OE.INKOTHAINV	
			OE.INTERPRF INV	
			OE.IVUSI INV	
			OE.MAKLNI HLDGS	
			OE.MERBND	
			OE.PRC LEXSHL	
			OE.RAKEVEST	
			OE.RMB PRPHLDC1	
			OE.RMB PRPHLDC2	
			OE.RMB PRPHLDC3	
			OE.RMB.AFGRI	
			OE.SYZIGUM TD	

S\_7.3.2: For all entities except IBD, we will no longer need to import cash balances from Smart for the market risk computation. As a matter of fact, funding process in Murex will go live 'big bang' at the completion of Ph3c for all business units in scope with exception of IBD. IBD has planned migration of their deals on Murex funding solution over period of few months. In this period Murex will have to still import cash balances from Smart for market risk computation for the IBD portfolios that were not yet migrated onto Murex funding.

S\_7.3.3: Funding process has to cater for cash collateral (variation margin, initial margin), as well as for interest paid or received on these. A solution has to be implemented to cater for missing funding functionality in Murex Collateral / Margin module.

S\_7.3.4: In terms of the scope of systems that will fund using position and residual cash funding: Osiris, Finesse, XH/ETS, (Sophis assumed to be descoped prior to Ph3c). More generally, any system may fund on MX using position and residual cash funding. The interface in Mx should be generic to enable easy integration with new external systems as the business evolves.

S\_7.3.5: In terms of the scope of systems that will have to fund on MX using Match to maturity funding: ACBS. However Murex interface for import of the products for match to maturity funding should be generic, allowing for easy integration of new systems. Integration of additional system should not affect dramatically scope of

implementation – should require configuration of data flow/connections, rather than new interface custom built from the scratch

#### S\_7.3.6: Description of the required governance and processes around FTP curves

The following principles need to be followed for the setup of the LP curves in MX:

- The LP curves will be managed by GTSY.
- The validation of the LP curves structure and quotes needs to be done outside MX.
- The LP curves will be used both for pricing the funding trades and for their MTM revaluation throughout their lifecycle.

FTP funding rate / curve will consist of the following components:

- **Interbank swap rate / curve (ISR):** Market interest rate matching maturity of the original asset/liability. Built off the following components:
  - Base rate: highest risk-free level of return from fungible instrument – SARB repo rate.
  - Base rate to 3m: swap base rate to 3-month duration (repo to JIB03 basis).
  - Swap term spread: cost of fixed rate hedge applicable on fixed rate transactions. It represents a swap of the 3-month rate to the rate appropriate for the term (maturity) of the underlying asset/liability.

GTSY will use one interbank swap rate /curve - mid rate - per currency for FTP curves construction. Two base currency interbank swap rates/curves will be set-up – one for ZAR and one for USD. Other currency rates/curves (i.e. non-ZAR and non-USD) will be derived from USD one using XCCY swap.

Assumption is that those swap curves are no other than the main tenor curves used by GM trading on MX ie ZAR JIBAR 3M and USD LIBOR 3M.

- **Liquidity management spread / curve:** Spread over the interbank swap rate charged or rewarded on top of the ISR based on liquidity characteristics of the underlying asset/liability. GTSY will manage this curve and it will consists of several components:
  - Liquidity premium (LP): covering standard liquidity characteristics of asset/liability (maturity, HQLA, etc.). Different liquidity premium rates/curves can be set-up for different products (e.g. different types of asset), portfolios and currencies.
  - Statutory charges are not going to be part of the FTP rate/curve and will be calculated and charged out to business units by GTSY monthly in a separate process (similar to the current liquids charge outs).
  - Tactical spread may be applied to motivate acquisition of certain types of funding. Tactical spread is not going to be part of the Liquidity Premium curve, but rather set-up as config table which will define tactical spread for specific parameters (customers, products, etc). Tactical spread is going to be included in the FTP pricing but is not applicable for MTM revaluation of the funding transactions.

General principles guiding RMB FTP curve construction:

- GTSY will leverage interbank swap curves maintained by GM. To construct the FTP curve GTSY will always use the mid-rate from these curves as a base funding rate, regardless of the underlying trade/position direction (buy/sell).
- Liquidity Premium (LP) curve will be controlled by GTSY. GTSY will set-up all LP curves as mid curves, with bid/offer bps specified for each curve. Bid/offer LP rates will be used for the FTP pricing on top of the applicable base rate (always mid).

Note: target solution in Murex must ensure sufficient control & validation of the FTP pricing (e.g. review and approval of FTP curve before being released in the system) to prevent mis-pricing of the funding transactions.



It was agreed that this is not part of the MX features, and this validation step of the curves cannot be handled on MX needs to happen outside.

S\_7.3.7: No other spread will be incorporated within liquidity premium. Tactical spread may be applied to motivate acquisition of certain types of funding. Tactical spread is not going to be part of the Liquidity Premium curve, but rather set-up as config table which will define tactical spread for specific parameters (customers, products, etc). Tactical spread is going to be included in the FTP pricing but is not applicable for MTM revaluation of the funding transactions.

Statutory charges are not included in LP spread either – they will be charged outside of Murex on a monthly basis.

S\_7.3.8: Below is a description of the different types and assignment criteria of FTP curves

- The following is the list of the LP curves that should be put in place:
  - ZAR and USD:
    - Unsecured LP curves (for non-HQLA products):
      - Asset/Liability LP curve to price unsecured non-HQLA assets/liabilities.
      - Derivative funding curve (FVA) to price derivatives in the context of IBD/CB (outside GM).
    - Secured LP curves (for HQLA products):
      - ZAR: there are 6 levels of quality for HQLA assets, each level will have its own LP curve.
      - USD: there are 2 levels of quality for HQLA assets, each level will have its own LP curve.
  - G8 currencies: no LP curves will be maintained for those, the collateral based discounting will be used in MX as a proxy. The LP curves for these will be built during pricing/valuation by MX on the fly, based on the USD LP curves and the FX curve of the G8 currency.
  - African currencies: no LP curves will be maintained for those as their funding is done through GM and will not be managed by GTSY.
- The following criteria will be used to assign the above LP curves:
  - Typology (used to identify internal/external + Asset/liability)
  - Currency
  - HQLA/non-HQLA asset (using the usage field)
  - Closing entity (London vs SA) -- potential

S\_7.3.9: One curve is required for assets and one for liabilities. These curves need to have just one rate – i.e. bid = offer = mid-rate in these curves.

S\_7.3.10: Mostly bonds and government bonds are considered HQLA products. These products will be clearly flagged in the system in their set-up as HQLA (including their level) and this flag will drive usage of appropriate HQLA curve. The solution should be generic to enable other instruments as HQLA in the future.

HQLA list of Bonds to be confirmed during design. Assumption is that any Bond or other products outside this list is considered as non-HQLA.

S\_7.3.11: There may be additional curves required for London and BRM. We have assumed 14 LP curves for GTSY SA (9 for ZAR and 5 for USD). For the scoping purposes we will assume additional 14 curves for London and 10 additional curves for BRM. I.e. in total 38 LP curves.

S\_7.3.12: Portfolio is not a criterion for curve assignment. The FTP curves will be primarily driven by product / currency and possibly Murex entity (SA vs London).

Note: this will impact criteria used for rate curve assignment as entity is not in the available keys. Solution to be defined during design.

Murex must enable to assign other components that impacting final FTP rate such as behavioral maturity and tactical spread at the portfolio / product / counterparty level. However, these components will not impact MTM revaluation of the funding transactions – only upfront FTP pricing will be affected by these.

S\_7.3.13: For residual cash funding, the applicable GM O/N curve will be used for pricing and revaluation. For open cash and PV funding, the applicable FTP curve will be used for pricing using behavioral maturity, but the valuation will use the FTP curve with the O/N maturity.

S\_7.3.14: Below is a description of the required funding methods  
4 methods of funding are required:

- **Trade funding (match maturity):** Real time, 1 to 1 match maturity funding process, where the system automatically generates an internal funding transaction with matching cash flow profile and maturity at an FTP rate corresponding to the underlying transaction maturity.
- **Open position PV funding:** Scheduled process that will run at minimum once a day at EOD (can be scheduled multiple time a day) which will fund overnight at predefined behavioural rate Present Value of all open positions on a portfolio. The behavioural rate should be assignable at the individual product level.
- **Open position cash funding:** Scheduled process that will run at minimum once a day at EOD (can be scheduled multiple times a day) which will fund overnight at predefined behavioural rate cash directly linked to the open trading / banking positions. This cash includes cash flows such as nominal / capital settlements (e.g. settled purchase of open bond position, drawdown of a loan, etc.), but excludes all realized PnL cashflows.
- **Residual cash funding:** Process that will run at the end of the day after the both position funding processes and that will fund overnight at ON rate all residual cash left over after the trade funding and position funding processes were run.

The above processes run in the logical sequence in which they are listed.

**OP-RMB:** Funding solution for FX Fwd desk will be defined in detail in design phase, however at this point not expected to have any new funding processes to be implemented apart from the ones listed above. FX FWD funding process will be configured leveraging one of the processes defined herein.

S\_7.3.15: Undrawn credit facilities are just future commitments that do not use any funds, so there is no need to fund those. Once the funds are drawn, the created deposit / loan transaction in Murex that will be funded using one of the above funding processes.

S\_7.3.16: Products without contractual maturity such as Call/depos, open loans/depos (or sticky assets such as bonds not intended to be held to maturity) will follow position funding methodology.

S\_7.3.17: Below is a description of how the BRM repo sweeping procedure (secured funding) must fit into the required funding methods

- The current repo sweeping procedure may remain in place or be discontinued – final decision still needs to be made. However, BRM requires new end of day asset sweeping procedure to be implemented. This procedure will repo (real repo, not buy sell transaction) at the end of the day all open fungible equity and fixed income assets from GM portfolios to BRM at predefined behavioral rate (definable at portfolio / product level). These will be overnight transactions.
- This procedure may work in conjunction with the current repo sweep procedure (in that case the current repo sweep procedure needs to run first) or replace it.
- Assumption for scoping is that the 2 sweeping procedures will co-exist
- The trades to be inserted by the procedure are actual Repos rather than Buy/Sell backs
- The maturity of those repos will always be O/N
- The scope of the portfolios to be swept is pre-defined (and can be easily updated), however it's not selected on the fly upon running the procedure
- Bonds and Equities is in scope of this procedure (however equities will not be on MX before PH4)

- Bonds and Equities used as collateral within the collateral module should also be subject to this repo sweeping procedure
- Ideally each desk will have its own sweeping portfolio inside BRM for tracking
- The sweeping will occur for T0
- Do you confirm that the repo rate to be used should be derived from the FTP curve using the behavioural maturity
- Assumption is that no spread is required on top of the repo rate
- The sweeping procedure must be fully automated (no user intervention)
- PB needs to be included in the BRM sweeping procedure. BRM has access to PB Client portfolios and sweeping needs to include those just like any other portfolio. Here we need to make sure we cater for trading agreement with PB clients (no sweeping/I d/I w/I m).

#### S\_7.3.18: GTSY specific requirements around funding:

##### GTSY set-up and requirements:

- **ZAR & USD funding:** GTSY will use a different set of portfolios for each currency, as follows:
  - Term / Overnight: GTSY manages separate overnight and term funding pools. Therefore, all funding legs with overnight maturity will be posted to one set of portfolios, while all term funded legs (i.e. with maturity other than ON) will be posted to different set.
  - Business unit: GTSY monitors / manages funding requirement per business units. Therefore, each RMB business unit (IBD, GM, CB) will have a dedicated set of portfolios in the GTSY funding book.
  - Asset / liability: GTSY manages separates requirements for asset and liability funding. Therefore, it maintains separate portfolios for asset and liability funding requirements/legs. To cater for the requirements GTSY book will include separate portfolio for any combination of the above dimensions: currency / duration (term / ON) / business unit / Asset / liability.
- GTSY manages funding requirements in 2 currencies only, ZAR and USD. Hence funding transactions in other currencies must be swapped into USD funding before they get posted in the GTSY USD funding portfolio with the following process:
  - Funding ticket in foreign ccy is booked in an intermediary portfolio (For example GTSY EUR CCY IRS).
  - An automatic cross currency swap is created to swap the foreign currency against USD with GM/GTSY market portfolio.
  - The resulting USD funding is then transferred to the target GTSY USD funding portfolio as per the above portfolio rules for USD.

#### S\_7.3.19: IBD specific requirements around funding

##### IBD set-up and requirements:

- Pre-agreed FTP rate: FTP rate for an IBD deal is agreed upfront between IBD and GTSY as part of the deal conclusion forum and may differ from the FTP rate valid in the system at the time of deal capture. The automated trade matching process on IBD portfolios will have to allow an IBD user to capture the agreed FTP rate and generate match funding transaction at this rate.
- Centralized management of IBD interest risk (including prepayment risk) - in dedicated GTSY book (ASU/FSU): IBD deals are 'immunised' – i.e. interest risk from these deals is transferred to central GTSY book (ASU/FSU), where the interest risk is managed on an aggregate basis to realize economic value for FRB. Hence ASU / FSU acts as an intermediary between IBD and GTSY funding book (FND/FCN) and manages IR resulting from the differences between client reference rate and banks funding rate (JIBO3 for ZAR), including risks stemming from client deal breaks such as prepayments.

The above ASU / FSU process will require that some IBD deals will be funded using combination of internal funding deposit / loan and IRS. Also the process consist from sequence of multiple steps (number of funding trades between IBD, ASU and GTSY portfolio and IBD wishes to automate the whole process as much as possible.

Assumption is that the deal funding step will be automated, while the deal IR hedging part will not be automated in this process

S\_7.3.20: IBD is looking for a solution that will use trade specific 'valuation spread' over the base curve for valuation of their trades. This applies also to IBD funding transactions. Murex collateral discounting functionality should achieve this requirement.

S\_7.3.21: GM specific requirements around funding

BRM will manage centrally all GM funding and will fund net GM funding requirements with GTSY. The GM funding process will be driven by two underlying requirements:

- Cash collateralization (equivalent of margining) of all GM unrealized PnL with BRM
- Centralized management of GM security collateral in BRM.

To achieve the above, GM wishes to run at the following sequence of EOD processes:

1. Repo sweep of all equity and FI fungible assets from GM portfolios to BRM at behavioural rate defined for each portfolio / product. This process will in effect enable central management of GM collateral.
2. Open position PV funding (as described above). This process will in effect cash collateralize overnight all unrealized GM PnL at the end of each day.
3. Open position cash funding (as described above). This process will fund overnight any open position related cash @ behavioural rate predefined for given portfolio.
4. Residual cash funding (as described above). This process will fund overnight any remaining cash on the portfolio @ ON rate. If set-up properly, this process should fund only realized PnL on portfolio.

GM might use for its term deals matched maturity funding as well. This process will be run real time prior to the above EOD process sequence.

## 8 Integration

### 8.1 Interfaces

S\_8.1.1: RMB.Ph3c\_Integration Scope.xlsx file provides the full list of interfaces and Extractions in scope of Ph3c

### 8.2 Reporting

S\_8.2.1: SOW will not cater for any reporting requirements. Those will be addressed during design and added to scope via CR process.

### 8.3 Data migration

Please refer to the RMB.Ph3c\_Migration Scope.xlsx