# *Target Business Model – Cash Market*

Version 2.53

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## List of Abbreviations

***CCP:*** Central Counterparty (Securities Clearing Center Company "Muqassa")

***CSD***: Central Securities Depository (Securities Depository Center Company "Edaa")

***CMA:*** Capital Market Authority

***DCM:*** Direct Clearing Member

***GCM:*** General Clearing Member

***ISD:*** Intended settlement date

***NCM:*** Non-clearing member

***SAMA:*** Saudi Central Bank

***SAR:*** Saudi Riyal

***SARIE:*** Saudi Arabian Riyal Interbank Express

***SBL:*** Securities Borrowing and Lending

***SPAN:*** Standard Portfolio Analysis of Risk

***T:*** Trade date

# 1. Introduction

The overall goal of the new operating model is to increase the attractiveness of the Saudi financial market to domestic and international participants and investors.

Key requirements to achieve this goal include enhancing the post-trade infrastructure with relevant services and models to meet the needs of issuers and investors, and establishing a safe and trustworthy financial framework in line with international risk management practice.

As a result, the proposed model will bring about a well-balanced post-trade structure for all participants based on recognized standards and best market practice, while maintaining a high degree of market efficiency and regulatory controls which are beneficial for the overall market.

## 2. Definitions

***Available Securities*** – securities available for carrying out transactions. Unsettled transactions are not regarded as available unless settlement completes.

***DvP (Delivery versus Payment)*** – a securities settlement mechanism that links a securities transfer and a funds transfer to ensure that delivery occurs if and only if the corresponding payment occurs.

***DvP Model 2*** – a DvP settlement mechanism where final transfer of securities from the seller to the buyer (delivery) occurs on a gross (trade by trade) basis, but final transfer of cash from the buyer to the seller (payment) occurs on net basis.

***DvP Model 3*** - a DvP settlement mechanism where transfer instructions for both securities and funds settle on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle.

***Cash agent*** – a bank Member of Edaa that facilitates cash settlement for Custody Member(s). Cash agents shall set Settlement Cap for Custody Members.

***CCP System*** – IT system used by Muqassa for facilitation of clearing of securities.

***CSD System*** – IT system used by Edaa for facilitation of securities and cash, settlement, safekeeping and registry functions.

***Custody Member*** – a member of CSD providing custody services for investors. AP that is a Custody Member can, but doesn't have to be, an Exchange Member at the same time.

***Default Waterfall*** – a cascading process prioritizing the use of financial resources in the event of a default.

***Edaa (CSD) Account Number*** – Account number of an end investor account at Edaa.

***Exchange Member*** – Authorized Person (AP) with a dealing license; a member of exchange providing trading services for its clients.

***FoP (Free of payment)*** – Transfer of securities without a corresponding transfer of funds.

***Independent Custody Member*** - a Custody Member providing custody services if trading services are provided by an Exchange Member.

***Investor Identification (Investor ID)*** – Unique attribute assigned by CSD system to identify investors. Saudi individual investors are assigned a national number by the Government, institutional investors use the number registered by companies. Other investors use a unique ID assigned by system.

***Real Time Gross Settlement (RTGS)*** - The real-time settlement of payments, transfer instructions or other obligations individually on a transaction-by-transaction basis.

***Saudi Central Bank (SAMA)*** - central bank of Saudi Arabia.

***Saudi Arabian Riyal Interbank Express (SARIE)*** - national RTGS payment system operated by SAMA that facilities cash settlement for CSD.

***Saudi Exchange***– the sole entity authorized in the Kingdom of Saudi Arabia to act as securities exchange.

***Securities Borrowing and Lending (SBL)*** – a collateralized loan of securities from one party (lender) of transaction to another (borrower). SBL is conducted to cover failed settlement, facilitate short selling or other activities.

***Securities Clearing Center Company (Muqassa)*** - entity authorized in the Kingdom of Saudi Arabia to act as a Central Counterparty (CCP).

***Securities Depository Center Company (Edaa)*** – Central Securities Depository (CSD) of Saudi Arabia which performs securities and cash settlement, and performs safekeeping and registry functions. CSD operates end beneficial accounts.

***Settlement Cap*** - a cash limit as determined by the relevant Cash Agent for each Custody Member.

***Trading Limit*** – Trading system limit set by CCP or GCM on an Exchange member level to control immediate exposure and prevent real-time errors.

***Trading System*** – IT system used by Saudi Exchange for facilitating trading functions.

## 3. Market Structure Overview

There are four market infrastructure entities and five market participants. The four market infrastructure entities are:

1. **Saudi Exchange:** Saudi Exchange's main functions are matching placed orders and processing pre-matched negotiated deals.
2. **Securities Clearing Center Company (Muqassa):** Muqassa is the Central Counterparty Clearinghouse (CCP). Its main functions are limits management, clearing trades, managing risk, managing collateral, generating settlement instructions and conducting fails management.
3. **Securities Depository Center Company (Edaa):** Edaa is the central securities depository. Its main functions are safekeeping securities, settling settlement instructions, executing corporate actions, facilitating securities issuance and rights subscriptions, and facilitating SBL transactions.
4. **Saudi Central Bank (SAMA)**: SAMA is the central bank and operator of the payment system.

The five market participants are:

1. **Exchange Member:** Exchange Member is a member of Saudi Exchange. Its main functions are order management (such as pre-validating orders, placing orders, modifying orders, and withdrawing orders) and trade management at Muqassa (such as rectify and split trades). Exchange Members need to appoint clearing members to clear and custodians to settle their trades.
2. **Clearing Member**: Clearing member is a member of Muqassa. There are two types of clearing members: General Clearing Member and Direct Clearing Member. Their main functions are clearing trades, managing trades and collateral.
3. **Custodian / Custody Member**: Custodian is a member of Edaa. The main functions of Custodians are creating and maintaining securities accounts, managing settlement instructions, facilitating pledge transactions, subscribing to rights, and transferring securities.
4. **Cash Agent (settlement bank)**: Cash agent is a member of Edaa. The main functions of Cash Agents are facilitating cash settlement at SAMA. Each Custodian needs to appoint a cash agent to handle cash settlement obligations arising from trades.
5. **Issuer Agent**: Issuer Agent is an entity appointed by an issuer to issue the securities and perform reporting (e.g. IPO, corporate actions).

## 4. Trade Flow Overview

Below is a high-level representation of a standard trade move as per the Target Business Model:

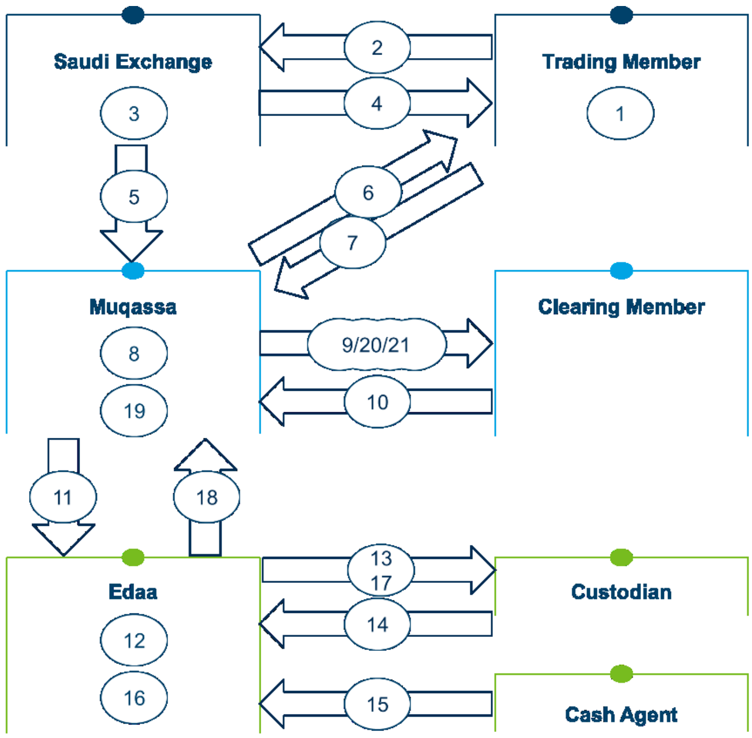


*Figure 1. Standard Trade Flow*

1. The Exchange Member validates clients' orders.
2. The Exchange Member sends the valid orders to Saudi Exchange.
3. Saudi Exchange matches the orders.
4. Saudi Exchange sends trade notification to the Exchange Member.
5. Saudi Exchange forwards the trades to Muqassa.
6. Muqassa notifies the Exchange Member of incoming trades.
7. The Exchange Member can manage (i.e. rectify, average price, split) its trades within a set timeframe.
8. Muqassa converts trades into settlement positions. These settlement positions are visible to both the Exchange Member and its appointed Clearing Member. From these settlement positions, Muqassa calculates total margin requirement.

9. Muqassa notifies the Clearing Member appointed by the Exchange Member of the total margin requirement and issues margin calls (if required).
10. The Clearing Member instructs its appointed Cash Agent to transfer cash collateral via SAMA and/or instructs its appointed custody member to transfer securities collateral via Edaa to Muqassa to satisfy the margin calls.
11. Muqassa generates settlement instructions and sends them to Edaa.
12. Edaa validates the settlement instructions.
13. The Custody Member appointed by the Exchange Member is notified of incoming settlement instructions and their status.
14. The Custody Member can manage (e.g. hold/release) the settlement instructions before settlement.
15. The Cash Agent appointed by the Custody Member manages the settlement cap set on the Custody Member.
16. On the intended settlement date, Edaa executes the settlement instructions to settle both the securities within Edaa and cash through the Cash Agent appointed by Custody Members via SAMA (i.e. executing FoP and DvP transactions).
17. Edaa notifies the Custody Member of the status of the settlement instructions.
18. Edaa updates Muqassa with the status of the settlement instructions.
19. Muqassa closes the settlement positions for which settlement instructions are settled and recalculates the total margin requirement. This may result in excess collateral.
20. Muqassa notifies the Clearing Member of the status of the settlement positions.
21. The Clearing Member can withdraw the excess collateral.

# 5. Trading

## 5.1. Boards

Below is the list of Boards in the trading system with respective settlement cycles:

*Table 1. Trading Boards and settlement cycles*

| Board | Description | Settlement Cycle |
|---|---|---|
| Equities (CCP Cleared) | Main Board for Equities | T+2 |
| | | T+0 to T+5 for negotiated deals |
| Fixed Income (CCP Cleared) | Main Board for Fixed Income | T+2 |
| | | T+0 to T+5 for negotiated deals |
| Nomu – Parallel Market (*CCP Cleared*) | Board for Parallel Market | T+2 |
| | | T+0 to T+5 for negotiated deals |
| OTC Equities (Non-CCP Cleared) | Board for unlisted and suspended equities | T+0 to T+5 |
| OTC Fixed Income (Non-CCP Cleared) | Board for unlisted and suspended fixed income instruments | T+0 to T+5 |
| Buy-in Equities (CCP Cleared) | Buy-in board for equities | T+0 |
| Buy-in Fixed Income (CCP Cleared) | Buy-in board for fixed income | T+0 |

1. **Main Boards (Equities, Fixed Income and Nomu)**: Order matching and data dissemination for both order book and Negotiated Deals take place where parties can also select the settlement cycle.
2. **OTC Boards (Equities and Fixed Income)**: Used for execution of trades unlisted Sukuk / Bonds and suspended securities. Settlement cycle is T+2 by default but may be defined differently by the parties (min T+0, max T+5). Only negotiated deals are allowed.
3. **Buy-in Boards (Buy-in Equities, Buy-in Fixed Income)**: Used to conduct buy-in in trades. Auction type of trading; settlement cycle is T+0. Muqassa also conducts mandatory buy-in (please see Fails Management section for details) through this board.

## 5.2. Order Entry

Additional mandatory information required to place and modify orders:

1. **Muqassa trading account number:** This account is used to store trades of the Exchange Member at the CCP system.
2. **Edaa (CSD) account number:** This is the end investor`s account at Edaa where securities are safe kept.

Additional information to be entered only when applicable:

1. **Short sell flag:** Used to identify short selling orders.
2. **Settlement date:** Used to specify intended settlement date for negotiated deals if different from T+2.

## 5.3. Order Validations

Exchange Members are obliged to conduct the following checks prior to transmitting orders to the trading system:

- Foreign investors do not buy restricted securities
- Edaa account is active and not restricted
- Investor (i.e. Investor ID) is active and not restricted
- For buy orders, cash will be available on the settlement date
- For sell orders, sellers have ownership rights on the securities when placing the sell order and securities can be delivered on intended settlement date
- For short-sell orders, the securities are eligible for short-selling and meet short-sell definition (please see Short Selling section)

Order rejections by the trading system should be expected to be based on the following market structure elements:

- Security is not listed in the respective board
- Security is listed but not available for trading in the respective board (i.e. suspended)
- Order price falls outside applicable fluctuation limit
- Order conditions are not acceptable at order entry moment
- Order value is in breach of applicable Trading Limits (please see Trading Limits section)
- Short sell order is not acceptable at order entry moment on the relevant security
- Muqassa Trading Account does not exist or is inactive
- Edaa Account number format is not acceptable or account is restricted

## 5.4. Short Selling

A short selling transaction means any sale of a listed security which the seller has borrowed sufficiently to match the sell order, or where the seller has exercisable and unconditional rights to borrow, pursuant to a securities borrowing and lending agreement in accordance with the Short Selling Regulations and Securities Borrowing and Lending Regulations.

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Exchange Members must indicate in the order entry message if the sell order is a short selling order. Such indication is mandatory.

The following scenarios are not considered short selling orders and therefore sell orders should not be flagged as short:

- Seller owns securities deposited in a different account from the informed one at order entry and can transfer them to the settlement account prior to settlement.
- Seller owns convertible securities and can convert and transfer them to the settlement account prior to settlement.
- Seller has entered into derivative contracts which grant the right to receive ownership on the underlying securities and can transfer them to the settlement account prior to settlement.

Short sell orders will be rejected/withdrawn (as applicable) whenever short selling is not permitted on the relevant security.

## 5.5. Trading Limits

To control immediate exposure, Muqassa, in collaboration with Saudi Exchange, implements pre-trade risk management in the form of Net/Gross Trading Limits. Gross Trading Limit constraints gross (buys and sells combined) risk-weighted value of trades an Exchange Member can execute during the trading session. Net Trading Limit constrains net (absolute difference between buys and sells) risk-weighted value of trades an Exchange Member can execute during the trading session.

Such limits are set by the Clearing Members and Muqassa itself in the CCP system and communicated to the trading system. Muqassa sets trading limits on Clearing Member level and Clearing Members in turn set limits for the Exchange Members provided that Muqassa limits are not exceeded i.e. GCM setting and updating trading limit for NCM.

In case an incoming order placed by an Exchange Member would imply the breach of either the Gross or applicable Buy/Sell Net Trading Limit, then such order would be rejected by the trading system.

The trading system calculates three types of utilization in SAR for each Exchange Member. Utilization of the limit is calculated based on the following formulas:

$$Gross\ Utilization = \sum_{k=0}^{n} BuyTradeValue_k * Risk\ Percentage\ of\ the\ OrderBook_k + \sum_{k=0}^{n} SellTradeValue_k * Risk\ Percentage\ of\ the\ OrderBook_k + \sum_{k=0}^{n} BuyOrderValue_k * Risk\ Percentage\ of\ the\ OrderBook_k + \sum_{k=0}^{n} SellOrderValue_k * Risk\ Percentage\ of\ the\ OrderBook_k$$

$$Net\ Buy\ Utilization = \sum_{k=0}^{n} BuyTradeValue_k * Risk\ Percentage\ of\ the\ OrderBook_k - \sum_{k=0}^{n} SellTradeValue_k * Risk\ Percentage\ of\ the\ OrderBook_k + \sum_{k=0}^{n} BuyOrderValue_k * Risk\ Percentage\ of\ the\ OrderBook_k$$

$$Net\ Sell\ Utilization = \sum_{k=0}^{n} SellTradeValue_k * Risk\ Percentage\ of\ the\ OrderBook_k - \sum_{k=0}^{n} BuyTradeValue_k * Risk\ Percentage\ of\ the\ OrderBook_k + \sum_{k=0}^{n} SellOrderValue_k * Risk\ Percentage\ of\ the\ OrderBook_k$$

At any point in time, an Exchange member has either a Net Buy utilization or a Net Sell utilization as positive which is checked against the limits assigned.

Risk Percentage (approximation to initial margin for each stock) is defined by Muqassa. In order for a Buy Order to be accepted once it has been validated:

- Gross Limit Utilization with the Buy Order should not exceed the Gross Limit
- Net Buy Utilization with the Buy Order should not exceed the Net Limit

In order for a Sell Order to be accepted once it has been validated:

- Gross Limit Utilization with the Sell Order should not exceed the Gross Limit
- Net Sell Utilization with the Sell Order should not exceed the Net Limit

The cancellation of orders decreases utilization. Trading Limit validation would also happen upon order amendment if its value is being increased. If, as a consequence, either applicable limit would be breached, then the amendment is rejected.

### 5.6. Kill Switch

The reduction of Trading Limits on an Exchange Member by Muqassa or Clearing Member neither deactivates nor withdraws any orders. If lowered to zero, it would reject all incoming orders, but outstanding ones would remain executable on the order book.

It becomes necessary for Muqassa and General Clearing Members to have an option of last resort to, in extraordinary circumstances, not only block the Exchange Member from placing any new orders into the trading system, but also to flush all its outstanding orders in one transaction.

This is the so-called 'Kill switch'.

## 6. Clearing

### 6.1. Overview

Muqassa receives all matched trades from Saudi Exchange in real-time and enriches the trades' details. Muqassa guarantees all CCP-cleared trades. In general, all instruments listed in the Exchange are CCP-cleared. However, Muqassa reserves the right to exclude some listed instrument from CCP-clearing based on Muqassa risk assessment of those instruments and regulatory approval.

Trades of CCP-cleared instruments are novated at the time of matching (aka. open offer) and subject to Muqassa's guarantee.

Non-CCP cleared instruments are instruments that Muqassa is not providing any guarantee for, therefore no margin is calculated for those. However, these transactions also benefit from other clearing services such as trade management and settlement instruction generation. Unlisted instruments are the main non-CCP cleared instruments.

### 6.2. Clearing Membership

**Direct Clearing Member (DCM):** Direct Clearing Member is a Muqassa member, which can clear its proprietary and its clients` trades. The eligibility criteria for being a DCM are:

- DCM must be an Exchange Member.
- DCM must have the minimum capital requirements set by Muqassa.
- DCM must have a proper risk management capability including IT and human resources.
- DCM must be a custody member or appoint a custody member at Edaa to settle securities and cash obligations resulting from trading activities.
- DCM must be an Authorized Person.
- DCM must have an arrangement with a bank, which has access to SAMA payment system (SARIE), to handle cash collateral transfers from/to Muqassa.
- DCM must contribute to Default fund.

**General Clearing Member (GCM):** General Clearing Member is a Muqassa participant, which can clear its proprietary and its clients` trades as well as the trades of Non-Clearing Members. The eligibility criteria for being a GCM are:

- GCM should have the minimum capital requirements set by Muqassa.
- GCM must have a proper risk management capability including IT and human resources.
- GCM could either be an Authorized Person or a Bank.
- Non-bank GCM must have an arrangement with a bank, which has access to SAMA payment system (SARIE), to handle cash collateral transfers from/to Muqassa.
- GCM must contribute to the Default fund.

**Non-clearing Member (NCM):** Non-Clearing Member (NCM) is an Exchange Member, which is not eligible or not willing to become a direct or general clearing member. NCMs are not required to contribute to the default fund. Each NCM must be a Custody Member or appoint a Custody Member at Edaa to settle securities and cash obligations resulting from trades executed by NCM.

## 6.3. Accounts

Accounts are used to facilitate trading, keeping positions and collateral at Muqassa.

### 6.3.1. Trading Accounts

Trades captured from Saudi Exchange are enriched and stored in trading accounts. Trade management activities (e.g. split, average price, and rectify) are performed in trading accounts. There are two trading account types based on their method of generating settlement instructions for end clients:

- Net Trading Account
- Gross Trading Account

Net Trading Accounts generate net client settlement instructions end-of-day as per the aggregation rules stated in Settlement Management section. Gross trading accounts generate gross (trade by trade) client settlement instructions after each trade in real-time. By default, gross trading accounts are used. Trading accounts are designated as:

- client account, or
- house account.

Client trading accounts are used to clear clients' trades and house-trading accounts are used to clear proprietary trades.

The following type of accounts are also opened to facilitate different trading and trade management activities:

- **Market maker accounts** used for market making activities.
- **Allocation accounts** to do trade allocation including average price trades.

#### 6.3.2. Settlement Position Accounts (SP)

All types of trading accounts are linked to settlement position accounts. The main function of settlement position accounts is to calculate and keep settlement positions from the trades in the linked trading accounts.

Based on the standard level of asset segregation provided to participants, each Muqassa participant has at least two settlement position accounts: one for its proprietary positions and one for its omnibus client positions. Muqassa participants can also opt for individual segregated position accounts for some of their clients

#### 6.3.3. Collateral Accounts (Margin requirement accounts)

Collateral accounts are used to keep collateral posted against the margin requirement arising from positions. In general, collateral accounts that are allowed to hold securities shall have an external reference to a corresponding Edaa account. There are different types of collateral accounts:

- **House collateral account** is used to keep collateral provided by the clearing member.
- **Individual segregated collateral account** is used to segregate collateral belonging to one client.
- **Free cash account (FCA)** is another type of a special collateral account, which can hold cash only. The purpose of this account is to provide a cash management tool for clearing members to avoid multiple cash collateral deposits and withdrawals through SAMA. A clearing member can internally transfer between from the FCA to other collateral accounts, and from Member Collateral Accounts to the FCA Cash kept in this account is not used as collateral with respect to satisfying any margin requirement.

- **Intraday funding account** is a collateral account that belongs to a clearing member and can be used to cover deficits of all margin requirement accounts, whether designated as house or client, without a need to internally transfer from intraday funding account to margin requirement accounts that have deficits.
- **Default fund account** is a type of collateral account with house designation that is used only for default fund contributions.

### 6.3.4. Standard Account Structure

A DCM has the following accounts as standard:

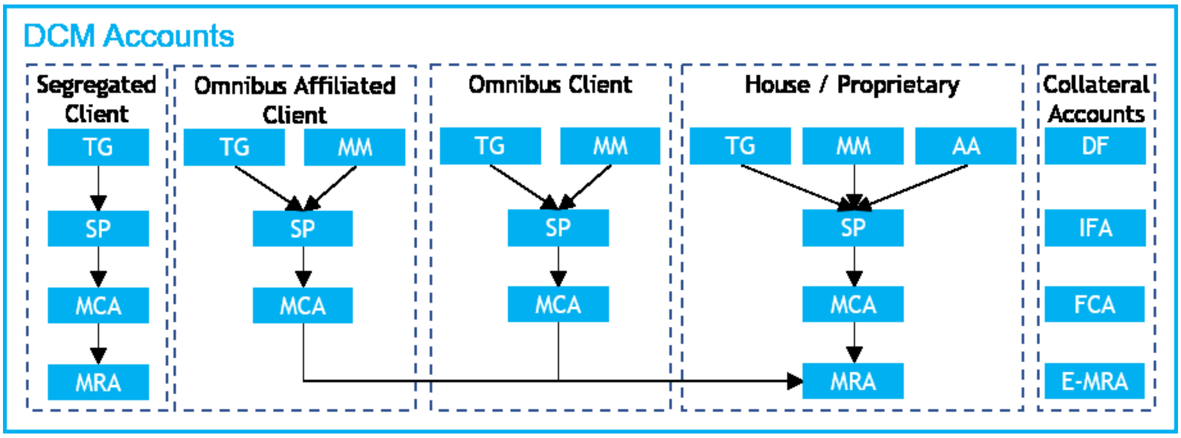



*Figure 2. Standard account structure for a DCM*

TG: Trading account gross

MM: Market maker trading account

AA: Allocation account

SP: Settlement Position account

MCA: Margin calculation account (a technical account to calculate margins)

MRA: Margin requirement account (collateral account)

DF: Default fund account

IFA: Intraday funding account

FCA: Free cash account

E-MRA: Collateral account to hold extra margin requirement resulting from the member`s assigned risk limits

Positions of DCM clients are segregated from house positions in two different settlement position accounts. Margin is calculated separately for each position account and then those are propagated to a single collateral account, which shall be funded by the clearing member.

On the other hand, standard NCM-GCM account structure is as follow:

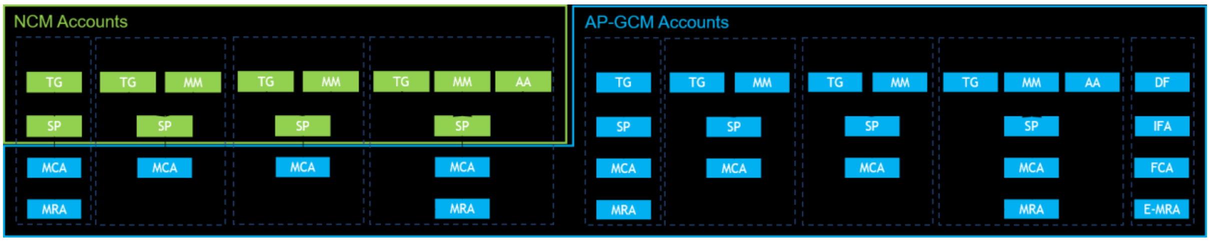



*Figure 3.   Standard account structure for NCM and its corresponding GCM*

GCM has a similar structure of accounts as DCM if it engages also in trading. For NCM, GCM shall maintain two position accounts: one for NCM clients and the other for NCM house positions. Margin again shall be calculated separately for these accounts and propagated to a single collateral account. Collateral and position accounts are under GCM, however trading accounts are opened under NCM.

If GCM is a bank, however, the standard account structure is slightly different since banks cannot be trading members.

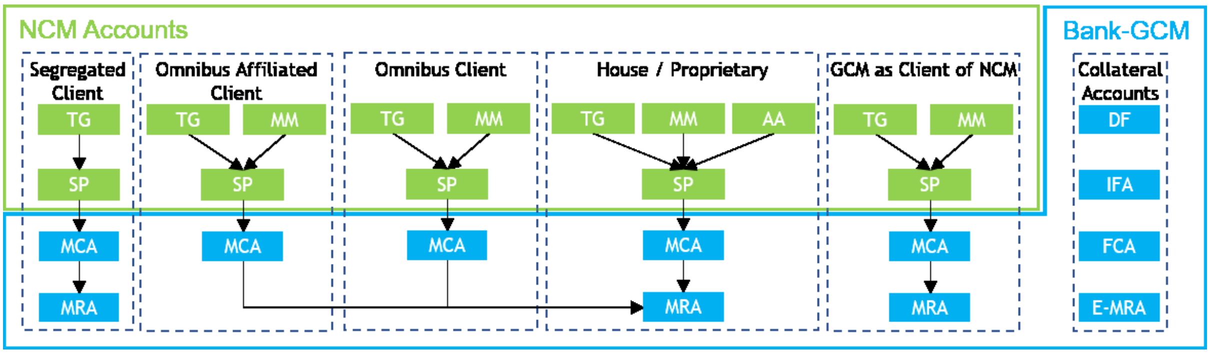



*Figure 4.   Standard account structure for NCM and its corresponding GCM (if bank)*

In addition to standard setup explained above, Muqassa will offer a full segregation that comes with Individual Segregated Accounts (ISA) that can be configured on Member's client request. In that case, segregation will be extended to Collateral account level.

## 6.4. Trade Management

Trade management is a post-trade activity that refers to average pricing, splitting and rectifying trades. All Muqassa participants (i.e. DCM, GCM and NCM) can manage their trades within the predetermined trade management timeframe.

### 6.4.1. Average Price Trades

It is possible for Muqassa participants to combine a group of trades and average their price. When average pricing a group of trades, the quantity of the resulting trade becomes the sum of the quantities of the group of trades and the price of the resulting trade becomes the volume weighed average price. In case there is a remainder due to rounding, the remainder is settled as a cash-only transaction. The group of trades must have the following same attributes to be eligible for average pricing:

- Security
- Order type (buy/sell)
- Edaa account number
- Muqassa Trading account number
- Settlement date
- Transaction date

Usually, split trades is used in conjunction with average price trades to allocate the resulting trades to different CSD accounts (see below).

### 6.4.2. Split of Trades

It is possible for Muqassa members to split a trade into multiple trades. The following information is needed to split a trade:

- CCP Trading account number for each split.
- CSD account number for each split.
- Quantity for each split.

The total quantity of all the resulting trades after split must be the same as the quantity of the original trade. The total amount of the original trade will be split proportionally (rounded to nearest Halala) to the quantities of the resulting trades. If there is a remainder due to rounding the amounts, the remainder is settled as a cash-only transaction. This is an automatic procedure; no action is required from the participants.

### 6.4.3. Rectify of Trades

It is possible for Muqassa participants to rectify a trade. Only post-trade information is rectifiable. These are:

- Edaa account number
- Muqassa Trading account number

### 6.4.4. Trade Management Restriction

Muqassa members, in their capacity as exchange members, are not allowed to perform trade management activities ***<u>on negotiated deals and market making trades</u>*** except for rectification of CSD account whenever information is either erroneous or suspended.

### 6.4.5. Trade Management Timeframe

The timeframe of trade management activities depends on the settlement date of the trades. The only rectification of Edaa account number allowed is for market making and negotiated deal trades.

*Table 2. Trade management timeframe*

| Settlement Date | Trade Management Timeframe |
|---|---|
| T+0 | Not Allowed |
| T+1 | End of Day T+0 |
| T+2 to T+5 | End of Day T+1 |

## 6.5. Settlement Management

### 6.5.1. Overview

Muqassa receives trades in real-time from the exchange and turns them into settlement positions, which later turn into settlement instructions. The below figure is a high-level overview of settlement management, where trades start their journey from trading accounts and are forwarded to settlement position accounts to be settled. From settlement positions accounts, Muqassa generates settlement instructions, which are later to be settled by Edaa.

### 6.5.2. Settlement Positions

A settlement position is an aggregation of trades in terms of:

- Security
- Transaction date

- Settlement date
- Settlement position account
- Counterparty
- Settlement Type (Gross / Net)

Aggregation is done in two levels by Muqassa:

- **Member level aggregation** is aggregation done by counterparties of either Muqassa (CCP cleared) or another Exchange Member (Non-CCP cleared) on settlement position account level.
- **Investor level aggregation** is the aggregation done by end investor (aka Edaa account) level.

Settlement positions are created when the first unique trade, based on the above aggregation criteria, is received. Then, settlement positions are updated in real-time after receiving subsequent trades, trade management activities (e.g. rectify), position maintenance activities (e.g. position transfer), corporate actions (e.g. redemption), and settlement instructions (e.g. settled settlement instruction). As a result, each trade affects both Member level and investor level settlement positions.

Positions can be transferred by Muqassa from one participant to another upon the request of both transferee and transferor.

If there are open settlement positions that are subject to corporate actions that affect the position value (e.g. redemption) or quantity (e.g. stock split), Muqassa updates such positions automatically.

### 6.5.1. Settlement Instructions Creation

Settlement instructions are generated from settlement positions. Each instruction corresponds to transfer of securities and cash from one account to another through Edaa. Settlement instructions are generated for both level of settlement positions, which are:

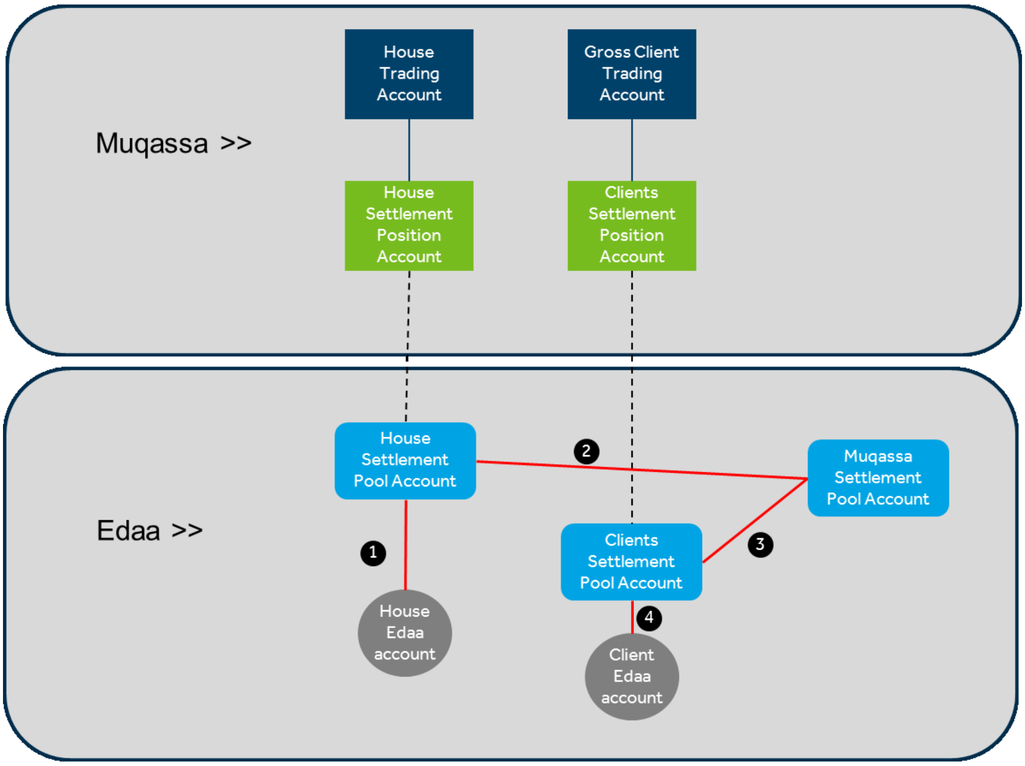



*Figure 5. Settlement positions & instructions overview for CCP-cleared transactions*

- **Member level settlement instruction:** This is the type of DVP settlement instruction (DVP model 3; net securities and net cash) created from member level aggregated positions, which could be for CCP-cleared trades or for non-CCP cleared trades. For a typical position of a trade that is CCP-cleared, settlement instruction from Exchange Member pool accounts to Muqassa pool account is created (see the figure above; arrows numbered as 2 and 3). Similarly, for a non-CCP cleared trade, the instruction is created from one Exchange Member settlement pool account to another one.
- **Client level settlement instruction:** This is the type of settlement instruction created from client level aggregated positions, which could be for CCP cleared trades or for non-CCP cleared trades. For both CCP cleared and non-CCP cleared settlement instruction from client (house) Edaa account to Exchange Member, clients (house) pool account is created (see the figure above; arrows numbered as 1 and 4). These transactions are typically in the form of Free of Payment (FOP) and created on gross basis[1], i.e. trade by trade. However, if client is using a different

[1] If gross trading accounts are used.

custodian than the one which is used by his/her Exchange Member, known as independent custodian, then the instruction is created from client Edaa account under his/her custodian to the Exchange Member clients pool account. These type of instructions are DVP (DVP model 2; gross securities[2] net cash).

Timings for settlement instruction creation are given below:

*Table 3. Settlement instruction creation timing*

| Type of Settlement Instruction | Creation time by Muqassa |
| --- | --- |
| Member level settlement instruction | End of day |
| Client level settlement instruction | Real-time |

There is an exception to above timings; when the trades' intended settlement date is T+0 (i.e. negotiated deals and buy-in trades), all settlement instructions (both for member level and client level) for such trades are generated from the gross quantity and amount (buy or sell) in real time.

Each settlement instruction has three attributes that affect settlement (see Securities Settlement section below for detailed information for such attributes):

- **Partial indicator:** Settlement instructions with partial indicator can partially settle with the available securities and cash.
- **Hold indicator:** Settlement instructions with hold indicator are not executed when they are due for settlement.
- **Priority:** Settlement instructions with higher priority settle first.

The default settings for the settlement instructions generated by Muqassa are as follows:

*Table 4. Settlement instruction default settings*

| Type of Instructions | Partial Indicator | Hold Indicator | Priority |
| --- | --- | --- | --- |
| Member level (CCP cleared) | Yes | No | Top Priority |
| Member level (non-CCP cleared) | No | No | Top Priority |
| Client level (same custodian) | No | No | Normal |

[2] If gross trading accounts are used.

| | | | |
|---|---|---|---|
| Client level (independent custodian) | No | No | Normal |
| Buy-in trades | Yes | No | Top Priority |

### 6.5.2. Settlement Instructions Management

Settlement instructions are updated as a result of trade management activities (see Trade Management section) done at either Muqassa or by Edaa.

Trade management activities update settlement positions, which in turn update settlement instructions. For example, after a trade is rectified, the original settlement instructions sent to Edaa (if any) is cancelled and a new settlement instruction for the rectified trade is generated and sent to Edaa.

Edaa sends settlement instruction status update to Muqassa as the settlement instructions go through their lifecycle in Edaa (see status below).

*Table 5. Status of settlement instructions*

| Status | Description |
|---|---|
| Pending | Settlement instructions are sent to and waiting for a response from Edaa. |
| Failed | Settlement instructions are rejected by Edaa. |
| Accepted | Settlement instructions are accepted by Edaa and waiting to be settled. |
| Recalled | Muqassa cancelled an accepted settlement instructions. |
| Cancelled | Edaa or Custodians cancelled an accepted settlement instructions. |
| Complete | Settlement instructions are settled. |

For settlement instructions that have failed status, the corresponding Muqassa participant (ideally the non-clearing (trading) member) needs to rectify the trade.

For the settlement instructions that are rejected by Edaa, (see Securities Settlement section for more info about settlement instruction validations), Muqassa participants have two options:

- Fix the issue that caused the settlement instructions to be rejected in the first place and then ask Muqassa to reinstruct the rejected instructions.
- Otherwise, Muqassa participants can trace the trades corresponding to the rejected settlement instructions and perform one of the trade management activities within the trade management timeframe to change the Edaa account numbers.

If Muqassa participants fail to do one of the above options, Muqassa auto-rectifies the rejected settlement instructions by changing the original Edaa account numbers to a designated Edaa account numbers that belongs to Exchange Members. Each Exchange Member must provide its designated Edaa account number to Muqassa to facilitate auto-rejection function.

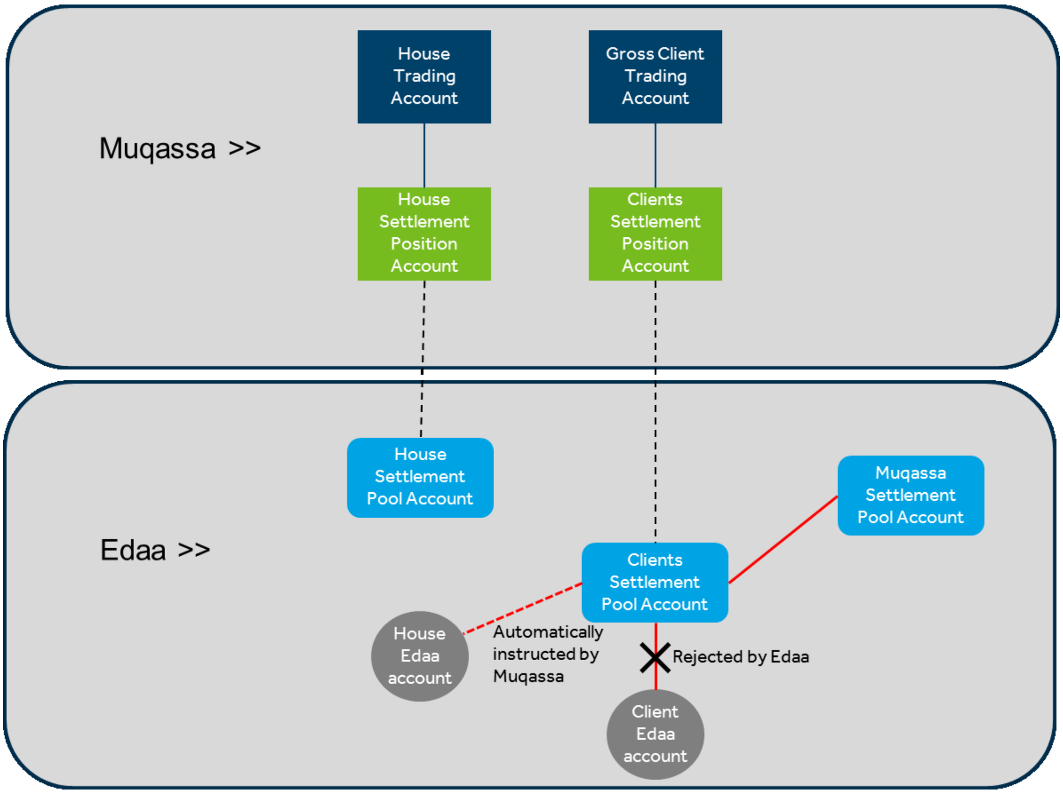



*Figure 6. Muqassa generated settlement instruction as a result of auto rectify*

## 6.6. Fails Management

Any settlement position where Muqassa is the counterparty (settlement positions between two Exchange Members or positions between clients and Exchange Members), that is not settled on the intended settlement date would be subject to fail management process.

When a client fails to settle against the Exchange Member, the Exchange Member can initiate a buy-in on behalf of its client to settle the overdue settlement position via submitting trades to the buy-in board called as the optional buy-in. Buy-in trades are cleared by Muqassa like normal trades.

Fails management for the positions where the Muqassa is the counterparty follows the sequence below:

- Muqassa initiates mandatory buy-in on behalf of the failing participant for its settlement pool account, which causes the failure, through submitting an order to the respective buy-in board.
- If the repetitive buy-in attempts are unsuccessful, then Muqassa substitutes the original position and respective settlement instruction with a cash payment instruction.

Muqassa also compensates the affected party for failed settlement with daily compensation payments deducted from the failed party. These payments are handled via new cash settlement instructions sent to Edaa. Failing party will be also subject to late settlement fee.

#### 6.6.1. Mandatory Buy-In Process

As a part of fails management, Muqassa initiates a mandatory buy-in order for failed quantity to settle the defaulted member settlement position obligation against Muqassa.

Muqassa participates in both buy-in sessions, the morning session and the afternoon session. However, each session is used for a different overdue cycle as follows:

*Table 6. Mandatory buy-in session timings*

| Overdue Cycle | Buy-in Session |
|---|---|
| Settlement Position overdue for one day (ISD+1) | Afternoon Session |
| Settlement Position overdue for two days (ISD+2) | Morning Session |

Unlike normal trades that settle in two days, the buy-in trades settle on the same day. In addition, for mandatory buy-in only (not for optional buy-in), the buy-side of the buy-in transaction affects only member level settlement positions and instructions. This results in generating only one leg between Muqassa and the defaulting member (i.e. one gross settlement instruction between Muqassa settlement pool and the defaulting member settlement pool). Muqassa does not initiate mandatory buy-in on behalf of defaulting end investors. Therefore, neither client level settlement position is updated nor client level settlement instruction is generated.

#### 6.6.2. Optional buy-in

Exchange Members can place buy-in orders both before, during and after the intended settlement date, either to prevent failures to happen or to cover their position to both against the CCP and their clients. As with any other order, Exchange Members need to specify a Edaa account number while placing a buy-in order.

#### 6.6.3. Cash Compensation

The affected member is cash compensated for the price changes and the opportunity cost resulting from late settlement. This amount is collected from the failing member and transferred to the affected member.

The cash compensation is calculated every day for the unfulfilled quantity/amount of the affected member level settlement positions until they are fully settled according to the following formula:

Cash compensation formula for failing to deliver securities on ISD:

$$Reference\ Price\ \ X\ \ Quantity\ \ X\ \ Interest\ Rate\ \ X\ \ Coefficient$$

Cash compensation formula for failing to deliver cash on ISD:

$$Settlement\ Value\ \ X\ \ Interest\ Rate\ \ X\ \ Coeficient$$

- Reference Price is the closing price
- Quantity is the overdue quantity of the member settlement position
- Settlement value is the overdue settlement value of the member settlement position
- Interest rate is the market interest rate
- Coefficient is an adjustment factor determined by Muqassa

#### 6.6.4. Cash Substitution

After the buy-in is initiated and failed for several times or when buy-in is not applicable (e.g. the security subject to buy-in is delisted due to expiry, corporate action, suspension, etc.), a cash substitution would kick-in for final closure of the settlement position, which cancels the original member level settlement instruction and replaces it with cash settlement instruction.

Cash substitution is calculated according to the following formula:

$$Max\ [\ 0\ ; Reference\ Price\ \ X\ \ Quantity\ \ X\ \ Coefficient\ -\ \ Settlement\ Value\ ]$$

- Reference price is the closing price
- Quantity is the overdue quantity of the member settlement position
- Coefficient is an adjustment factor determined by Muqassa
- Settlement value is the overdue settlement value of the member settlement position

### 6.6.5. Late Settlement Fee

For every day a settlement position is overdue, a late settlement fee is calculated and charged to the failing member in the invoice. Late settlement fee for security settlement failure is calculated as per below:

$$Quantity\ \ X\ \ Reference\ Price\ \ X\ \ Fee\ Rate$$

Late settlement fee for cash settlement failure is calculated as per below:

$$Settlement\ Value\ \ X\ \ Fee\ Rate$$

Reference price is the closing price; quantity is the overdue quantity of the member settlement position; settlement value is the overdue settlement value of the member settlement position and fee rate is determined by Muqassa.

### 6.6.6. Fails Management Timeline

Fails management events with their timeline are summarized in the table below:

*Table 7. Fails management timeline*

| Day | Event |
|---|---|
| ISD | • Cash compensation is calculated.<br>• Late settlement fee is charged to the failing member. |
| ISD+1 | • Mandatory Buy-in order is placed on the buy-in board in the afternoon session.<br>• If the instruction continues to fail by the end of the day:<br>    ○ Cash compensation is calculated.<br>    ○ Late settlement fee is charged to the failing member. |

| | |
|---|---|
| ISD+2 | • Mandatory Buy-in order is placed on the buy-in board in the morning session.<br>• If the instruction continues to fail by the end of the day:<br>    ○ Failed instruction is canceled and cash substitution settlement instructions are sent to Edaa in the end of the day to be settled next day.<br>    ○ Late settlement fee is charged to the failing member. |

## 6.7. Collateral Management

### 6.7.1. Overview

Clearing members are obliged to provide collateral against their margin and default fund requirements. Muqassa accepts the following asset classes as collateral:

- Cash (SAR only)
- Government bonds and sukuks
- Selected equities
- Selected corporate bonds and sukuks

Even if certain securities are eligible as collateral, a clearing member is not allowed to deposit such securities as collateral if those securities are issued by the clearing member, its parent company, subsidiaries, and/or affiliates. Any such collateral deposit will be valued at zero.

Muqassa only accepts transfer of title as a legal form of depositing eligible collateral.

### 6.7.2. Concentration Limits

There are four types of concentration limits, where first three are on account level (could be different between collateral against margin and default fund) and the last one is, overall, on Muqassa level:

- **Minimum cash (SAR):** Certain % of the total margin should be covered by cash collateral
- **Instrument group limit:** A group of instruments cannot cover more than a certain % of total collateral
- **Individual instrument limit:** A particular instrument cannot cover more than a certain % within its group
- **Issuer limit:** Not more than a certain % of total collateral received by Muqassa can be issued by one issuer. This limit does not apply to instruments issued by the government of the Kingdom of Saudi Arabia.

### 6.7.3. Collateral Custody

Below is the list of collateral and places of custody:

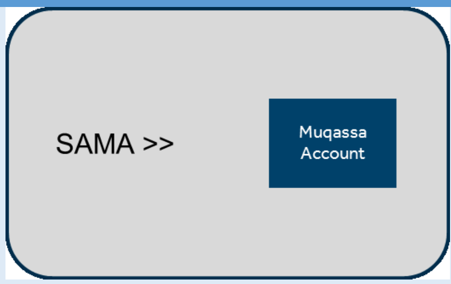
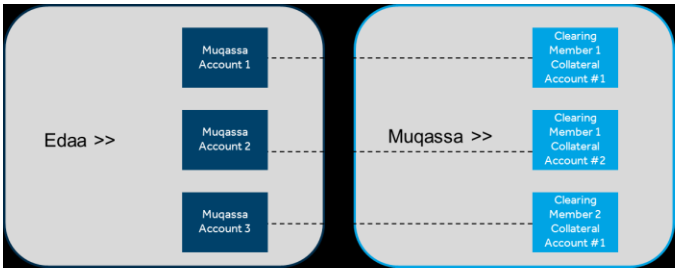
<table>
<tr><th>Type of collateral</th><th>Place of custody</th><th>Account structure of custody</th></tr>
<tr><td>Cash (SAR)</td><td>SAMA</td><td>
</td></tr>
<tr><td>Government bonds and sukuks</td><td rowspan="3">Edaa</td><td rowspan="3">
</td></tr>
<tr><td>Equities</td></tr>
<tr><td>Corporate bonds and sukuks</td></tr>
</table>

*Figure 7. Collateral custody*

For securities (bonds and equities) Muqassa operates securities accounts at Edaa, each of which is mapped to a corresponding collateral account at Muqassa. However, for cash, there is one account of Muqassa at SAMA.

### 6.7.4. Valuation of Collateral

Each collateral is valued within certain time intervals (batches) based on the last market value. If there is no price for a certain instrument, then a theoretical price is used instead. Each instrument, except for cash in SAR, is also subject to haircuts.

A collateral account can hold multiple types of instruments and cash, and total valued collateral is determined based on the concentration limits (see Concentration Limits section). Total valued collateral is compared to the margin requirement and the difference is either a collateral surplus or deficit.

### 6.7.5. Collateral Deposit and Withdrawal

If there is a collateral surplus, then it could be withdrawn by the Clearing Member. Withdrawal is initiated in the Muqassa system. After initiation, Muqassa checks whether:

- Remaining collateral after the withdrawal is enough to cover the margin requirement while maintaining related concentration limits.
- The account is in margin call or not.
- Withdrawal request is conducted within allowable timeframe determined by Muqassa.

After the abovementioned conditions are satisfied, Muqassa initiates payment through SAMA if the collateral is cash (SAR), or a free of payment transfer through Edaa if the collateral is a security.

Collateral deposit should be initiated by the clearing member via its bank through SAMA for cash (SAR). The payment should be made to Muqassa account at SAMA and the destination collateral account number at the CCP system needs to be specified. Similarly, securities collateral deposit should also be initiated by the clearing member via its custodian through Edaa. The transfer should be made to the relevant Muqassa account at Edaa (see Accounts section).

Deposit and withdrawal transactions will have specified timeframes during which clearing members can perform.

#### 6.7.6. Collateral Transfer

Each clearing member has a free cash collateral account (please see “Accounts” Section) that can be used to transfer cash collateral from/to Muqassa. The purpose of this account is to minimize number of transactions via SAMA. Then, members can internally transfer cash collateral from house to their client collateral accounts or between house collateral accounts only. Internal securities collateral transfer is not possible.

#### 6.7.7. Corporate Actions on Securities Collateral

Any corporate action (e.g. stock split, redemption, etc.) that affects the deposited collateral is handled by Edaa and accounted for by Muqassa. Between ex-date and record date, Muqassa uses unadjusted price for valuation. After payment date, Muqassa uses adjusted prices and new quantity.

#### 6.7.8. Interest on Cash Collateral

Saudi Riyal collateral is subject to interest paid by SAMA. Interest is calculated daily and distributed monthly. Accrued interest will be calculated daily based on end-of-day balances.

# 7. Risk Management

## 7.1. Overview

Muqassa, being the CCP, manages the risk of counterparty via various tools including trading limits, margins and default fund

## 7.2. Trading Limits

Trading limits are part of pre-trade risk management and designed to limit potential exposure on trading level. These limits are required to prevent any given Exchange Member from having a (risk-weighted) value of trades and orders above a certain limit. Effectively Muqassa can limit the exposure of a GCM or DCM, flexibility is given to GCM/DCM to set a lower limit assigned by Muqassa. In addition, the functionality allows also the GCM to cap its exposure for each of its NCMs.

For every GCM/DCM, Muqassa defines a gross and net limit (for both buy and sell) to be applied by the trading system. The trading system calculates three types of utilization in SAR for each Exchange Member. There are three types of limits namely gross limit, net buy limit and net sell limit. Orders breaching either of those limits are rejected by the exchange (see Trading Limits section for how limit utilizations are calculated).

## 7.3. Margins

Margins are collected to provide protection to Muqassa from current exposure as well as potential future exposure. Muqassa's risk management system calculates different margin components and aggregate into one margin requirement. Margin components, which are taken into consideration, include the following:

- **Initial Margin (IM):** Risk Margin which is the main part of the total margin requirement and refers to the estimated risk for price movements
- **Variation Margin (VM):** Mark-to-market variation for each settlement positions
- **Add-on Margin:** Margin calculated to cover components that are not covered by the IM and VM such as concentration margin, add-on for rolled over trades and add-on for breach of risk limit.

Total Margin requirement is calculated using three scenarios. Three different set of settlement positions, depending on intended settlement day, are used to capture the time risk:

- This set includes all settlement position, from S0 (settles today, including rolled over trades), S1 (settles next business day) and S2 (settles the day after the next business day, or any business day later).
- This set includes all settlement positions from S1 and S2, but not S0, according to the above.
- This set includes all settlement positions from S2, but not from S0 and S1, according to the above.

This can be represented in the following formula:

$$Total\ Margin = Max[(IM_{S0,S1,S2} + VM_{S0,S1,S2} + Add - on\ Margin), (IM_{S1,S2} + VM_{S1,S2}), (IM_{S2} + VM_{S2}), Minimum\ Margin\ Requirement]$$

A minimum margin requirement is defined by Muqassa to guard against sudden increase in market volatility if the initial margin computed based on margin models is low in periods of low volatility. Margin calculations are performed at the start of the day, at scheduled times intra-day, and end-of-day. Margin calculations may also be performed on ad-hoc basis at any time during the day, as Muqassa deems necessary. In addition, real-time margin calculations are performed as soon as a trade happens. When there is a position change in the account, the system automatically triggers real time margin calculation process for this account.

#### 7.3.1. Initial Margin (IM)

Initial Margin calculations for equities is performed according to the Delta Hedge (SPAN-compatible) margining methodology. The calculation can be broken down into two steps. The first step is the calculation of risk arrays for each security. The second step is calculation of portfolio margin, which covers the scanning risk and inter-commodity spread credit.

The core of Delta Hedge margin model is to simulate potential market moves and calculate the profit or loss for each combination of securities and settlement date under 16 different risk scenarios known as the risk array. For each scenario point, an associated price shift and implicit volatility are determined. Based on those values, theoretical prices are calculated to determine a profit or loss for one long position. The profit or loss in each scenario point represents its risk array value. In the case of equities, the impact of volatility is not applicable. Another key concept of Delta Hedge is the Combined Commodity, where securities of the same underlying are grouped together for analysis. In other words, a typical Combined Commodity for equities market will contain same security or a security belongs to the group of securities has similar risk characteristics with different settlement dates. The key parameter that controls the price shift is known as price scanning range (PSR), also known as margin rate. PSR can be defined by Muqassa as a nominal amount in SAR or a percentage to the margin price.

After risk array value is calculated, next, for each combined commodity, calculate the scanning risk separately. Within a combined commodity, it is assumed that price and implied volatility will move fully correlated. For each settlement position belonging to this combined commodity, the net position (long position minus short position) is multiplied with the previously determined risk array values. Those values are point wise summarized for all settlement positions, which gives a total profit or loss for this combined commodity in 16 different scenario points. The scanning risk equals the worst-case loss of those.

*Initial Margin = Scanning Risk Net * Margin offset Limit %+ Scanning Risk Gross * (1- Margin offset Limit %)*

Margin Offset Limit (%) is a factor for offset reduction to limit the netted part in the portfolio.

In the event Combined Commodities within a portfolio are considered to be correlated, commodity spread credit is calculated. Intercommodity spread credit reduces the margin requirement. In calculating the intercommodity spread credit, a number of Combined Commodities are scanned together - similar to having been included in the same combined commodity. Credits in the combined scanning may, however, be reduced by the parameter Gain Allowance Factor. The number of possible spreads are evaluated in accordance to the priority determined by Muqassa.

In each single spread, there is one target leg (Combined Commodity) and one or many non-target legs (Combined Commodities). For both target leg and non-target leg, one takes the "positional risk array" as input. These values are added pointwise to a sum "positional risk array" with 16 values. Positive values, representing a loss, are added as-is. Negative values, representing a credit, are multiplied by the Gain Allowance Factor before added to the sum "positional risk array".

The scanning risk for both target leg and non-target legs will be replaced by worst case in the sum positional risk array. This means that the credit is the difference between the "sum scanning risk for all target and non-target legs" and the new scanning risk. This procedure may then be repeated for subsequent spreads. Results from target legs of earlier spread may be used as input to subsequent spreads.

### 7.3.2. Variation Margin (VM)

Variation margin for equities is based on the difference between trade price and the current price. It is the margin obligation to be fulfilled to cover the notional loss with respect to the outstanding trades. Variation Margin is calculated separately for Open Position per security within Settlement Position Account (SPA) and reflected within the Total Margin requirement and not subjected to settlement. Variation Margin calculations are performed at scheduled specific times intra-day and end-of-day, or at shorter interval as Muqassa deems fit. Also, Muqassa may determine different price change thresholds for different Security types, and if a Security has a price fluctuation more than the predetermined threshold, then only for that specific Security Variation Margin is updated real-time immediately for all of the accounts including that security to reflect only its price change.

Variation Margin value is based on the difference between an Open Position obligations/liabilities to be settled and current market value of the Open Position as:

$$VM = (-1) * (Quantity * Price + Settlement\ Amount)$$

For Fixed Income securities, Quantity can be expressed as nominal. For coupon bearing securities dirty price (including accrued interest) will be used for Variation Margin calculation.

### 7.3.3. Add-On Margin

#### 7.3.3.1. Additional/Extraordinary Margin

In order to mitigate settlement concentration risk, an additional margin on certain securities may be added once a member holds a certain level of positions of that particular security as Muqassa deems necessary. Muqassa defines the additional margin in a form of nominal amount or as a percentage based on the number of positions on predefined tiers and added to the total margin requirement. The parameters used to calculate additional margin are below:

*Table 8. Additional/Extraordinary Margin Parameters*

| Number of Positions | Percentage Value | Nominal Value |
|---|---|---|
| $P_1$ | $PC_1\%$ | $FV_1$ |
| $P_2$ | $PC_2\%$ | $FV_2$ |
| $P_3$ | $PC_3\%$ | $FV_3$ |

Assuming that the account has N number of positions for this security and $P_2<N<P_3$. If Muqassa chooses to configure the margin based on nominal value, then the additional margin is calculated as follows:

$$Additional\ margin = P_1 * FV_1 + (P_2 - P_1) * FV_2 + (N - P_2) * FV_3$$

If Muqassa chooses to configure the margin based on percentage, then the additional margin is calculated as follows:

$$Additional\ margin = P_1 * PC_1\% * Price + (P_2 - P_1) * PC_2\% * Price + (N - P_2) * PC_3\% * Price$$

#### 7.3.3.2. Additional Margin on Rolled-Over Trades

An add-on margin for the failed delivery trades is calculated and added to the total margin calculation. This is expressed as a percentage of the settlement amount for the rolled over trades, depending on how many business days has elapsed after the original settlement date, e.g. x% if trade is rolled one day, y% if trade is rolled two days according to the tiers defined by Muqassa for scaling. The definition of a "Rolled Over" trade is an overdue settlement position. The result of this calculation is included in the new add-on margin component. It is one of the components of the Total Margin Requirement.

### 7.3.4. Risk Limits

Member's credit standing is assessed based on qualitative and quantitative factors. Based on these assessments, Muqassa assigns a member level Risk Limit. Additional margin can be imposed on members, if the total margin requirement of the member exceeds the risk limit assigned to the respective member. The amount of increased margin is calculated based on scaling of the portion that exceeds the configured level, where the scaling can be done in multiple tiers. The increased margin is added on the participant level and is also added to a configured margin requirement account.

## 7.4. Margin call

Collateral evaluation is the process of comparing the value of the provided collateral against the value of the required collateral a.k.a. margin or default fund requirement. The evaluation process runs in a predetermined interval. If the evaluation process resulted in deficit by a predetermined percentage, (e.g. maintenance margin percentage), an intraday margin call is issued for that account, and the member needs to satisfy the margin call within the timeframe set by Muqassa intraday. Members are notified about end of day margin requirements to be satisfied within timeframe set by Muqassa next business day.

If a collateral account has a margin call, collateral withdrawal from that account is suspended. As discussed above, if the member deposits collateral that exceeds the individual instrument limit or instrument group limit, such collateral is valued at zero. This zero-valued collateral will not be available for withdrawal if the collateral account has a margin call.

In some cases, withdrawing some collateral may result in increase of the total collateral value due to how the valuation process works. Even when withdrawal results in an increase of the collateral value, the member is not able to withdraw from the collateral account that has a margin call.

On the other hand, if the evaluation resulted on surplus, the member is allowed to withdraw the surplus, given that this withdrawal does not cause breaches to the collateral concentration limit.

As mentioned above, there is a minimum cash collateral requirement for each collateral account. This minimum cash requirement is considered during the evaluation process. If the cash collateral balance is less than the minimum cash requirement, a margin call for cash is issued.

## 7.5. Default Fund

Muqassa establishes and maintains the Default Fund as a mutualized resource to support ongoing settlement in the market. Muqassa determines the size of Default Fund at every first business day of a calendar month, unless communicated to the Clearing Members under special circumstances. The stress testing results of every Clearing Member's open positions forms the basis for size determination. Typical lookback period for the determination of size is 90 business days, unless Muqassa decides a different lookback period should be applied.

Required Default Fund Contribution of each Clearing Member is re-calculated at every new Default Fund period after the size is determined. The Clearing Members' shares of the Default Fund are determined proportionally by reference to the average daily Initial Margin requirement of the relevant Clearing Member during the 30 days preceding the calculation. Clearing Members, after receiving notification, shall deposit the required contribution within five business days.

There is a minimum contribution to the Default Fund, which is different for General Clearing Member and Direct Clearing Member. A new Clearing Member shall contribute to the Default Fund the minimum amount required, or a higher amount as determined by Muqassa.

## 7.6. Default Management

### 7.6.1. Default Management Process

"Event of Default" is defined as any event or circumstance which leads the CCP to determine that a Clearing Member is or appears to be unable, or is likely to become unable, to meet its obligations. With the declaration of default, unless otherwise stipulated by Muqassa's Default Management Committee (DMC), all outgoing payments and withdrawal requests to the defaulting member is stopped and measured, such as closing-out positions, liquidation of collateral as well as porting positions and related collateral to the surviving clearing members are taken.

### 7.6.2. Default Waterfall

In case of a member default, Muqassa can use resources in the following order:

- Proprietary assets provided by Defaulting Clearing Member, which includes both collateral and the default fund contributions of the Defaulting Clearing Member.

- Muqassa’s dedicated capital as provided for default management. Once these dedicated resources are exhausted, a party has no recourse to any other asset of a Muqassa, unless otherwise provided in the Clearing Rules.
- Upfront default fund contributions of Non-Defaulting Clearing Members, not including any excess collateral.

Should the DMC decided that the loss to be attributed to the default fund seems likely to exceed the total default fund size, the members may be asked to deposit the additional contributions they have committed. The members are obliged to deposit the additional contributions within the time period that DMC decide after the request thereof.

# 8. Settlement and Custody

## 8.1. Overview

Securities Depository Center Company (Edaa - Center) is a place where the securities are registered as well as where settlement is conducted.

## 8.2. Membership

Edaa members are:

- **Custody Member**: Responsible for handling custody and settlement functions
- **Cash Agent**: Acting as cash agent for Custody Members and responsible for the settlement of cash leg.
- **Issuer Agent**: Responsible for IPO transfers, issuance/cancelation, and reporting.
- **CCP**: CCP is the settlement instruction provider and a collateral agent.

Independent Custody Members have the same functions as other Custody Members. Exchange Members must have settlement pool accounts as a Custody Member. Custody Members also service CCP Clearing Members for securities collateral transactions (deposit or withdrawal).

## 8.3. Investors

Investor uniqueness is maintained with Investor ID, which is a combination of National ID (NIN), country and investor type. Investor ID is the single attribute used for all transactions. Foreign investor creation must be done with investor home country NIN issued by its Authority, passport numbers shall not be used as NIN because the numbers are changed with new passport issuances. Passport numbers can be submitted as an additional identifier. Investor ID creation rules are:

- For KSA individuals and residents NIN (10 digit number beginning with 1 or 2) is used as Investor ID.
- For KSA companies submitted number will be used.
- Other KSA investors will be created with 14 digit sequential numbers.
- Other foreign investors (including GCC) will be created with 14 digit sequential numbers; first two digits as country code.

## 8.4. Accounts

Securities accounts are created/deactivated by participants. Some account types (i.e. Natural person, legal entity, house) are created solely by the custodian, others require Edaa approval (i.e. settlement pool and collateral accounts.) List of account types and authority in following table.

*Table 9. Edaa account types*

| Account Type | Business function | Authority to Create Account |
|---|---|---|
| **Securities Accounts defined for Custodians** | | |
| Natural person | Investor account | Account operator |
| Legal entity | Investor account | Account operator |
| House | Custody Member house | Account operator |
| Collateral client | Separate collateral account for investor | Account operator with CSD approval |
| Collateral omnibus | Transitory account against CCP collateral - client omnibus | Account operator with CSD approval |
| Intermediary Account (mutual fund) | Transitory account between issuance account and investor account | Account operator with CSD approval |
| Lead Manager Rights Account | Unsubscribed rights account | Account operator with CSD approval |
| Member Settlement Pool | Exchange Members settlement account against CCP | CSD |
| Distribution | Transitory account between issuance account and investor account | CSD |
| Omnibus | Commingled investor assets for foreign CSD’s | CSD |
| **Securities Accounts defined for CCP** | | |

| | | |
|---|---|---|
| CCP collateral - client omnibus | Commingled collateral | CCP |
| CCP collateral - client segregated | Investor based collateral | CCP |
| CCP collateral - house | CCP clearing members house collateral | CCP |
| CCP Settlement pool | Transitory account for settlement | CCP |
| **<u>Securities Accounts defined for CSD as a participant</u>** | | |
| Issuance | Issuance of securities | CSD |
| CA Distribution | Corporate action distribution | CSD |
| Mirror (linked issuer CSD) | Cross Listing of foreign securities | CSD |
| Default (linked issuer CSD) | | |
| Default Securities Account (linked issuer CSD) | | |
| Default Securities Account | | |

Edaa generates the securities account number. Account number consists of 11 digits and is generated according to the following algorithm; first 3 digits of the securities account ID is alphanumeric and taken from the participant code (i.e. member code), following 8 digits consists of decimal (numeric) characters and generated according to sequential numbering of decimal numbers within the custodian.

Investors can open accounts in multiple custodians, including independent custodians. Trading members Muqassa level trading accounts are not linked with investor accounts. As a result, investor can use more than one broker for single account. Custody Members open settlement pool accounts designated for Exchange Members. These accounts are necessary for securities settlement resulting from trading activities.

Interested party information can be defined for securities accounts for specific requirements, i.e. guardian, CCP collateral. CCP collateral defined interested parties are validated against collateral transactions done via Muqassa. Investors ID's created by custodians shall be used by all custodians as Interested Party.

Securities accounts can have labels with CSD configuration. Labels are used for reporting purposes. Available labels are: Depository Receipt, ETF, Mutual Fund, Corporate Action Fractions, Certificates, Murabaha.

Custodians can define instruction automatic on hold mechanism per each account. As a result, each received instruction will not settle unless custodian release.

## 8.5. Securities Settlement

### 8.5.1. General concepts

Settlement instructions can be created by custodian or Muqassa. All instructions are subject to same functions after creation regardless of source. Available functions for custodians are: On hold/Release instructions, Priority setup for instructions, Partial setup for instructions, Cancellation of unsettled instructions.

All settlement instructions are validated by CSD system. Valid settlement instructions are processed for settlement-on-settlement date, invalid instructions are rejected. *i.e. non-available or restricted account, non-compliant investor nationality (Makkah-Madina securities for foreign investors)*

Settlement instructions types define their business processing rules. Instruction types are:

- **Free of Payment (FOP):** Movement of securities without cash movement (also known as DFP – Delivery Free of Payment). i.e. CCP instructed within the same Custody Member, transfers, corporate action distribution.
- **Delivery versus Payment (DVP):** Exchange of securities against cash. Direction of securities and cash movement is opposite i.e. CCP instructed against CCP or different Custody Member, tradeable rights subscription, SBL (when collateral is cash).
- **Payment Free of Delivery (PFOD):** Exchange of cash without movement of securities. i.e. corporate action claims, cash substitution and compensation.
- **Delivery with Payment (DWP):** Direction of securities and cash movement is the same. i.e. special corporate action events; company spin-off.

Settlement instruction statuses are as follows:

- **Unmatched:** Settlement instructions are received, counterparty instruction not found.
- **Matched:** Settlement instructions are received and passed Edaa validations. These instructions are waiting to be settled in the intended settlement date. This status corresponds to “accepted” status in Muqassa.
- **Rejected:** Settlement instructions are rejected because they did not pass Edaa validation. Rejection reasons are available. This status corresponds to “failed” status in Muqassa.

- **Cancelled:** Muqassa, Edaa or Custody Members cancelled already accepted settlement instructions. This status corresponds to "recalled" or "cancelled" status in Muqassa.
- **Settled:** Instructions are settled. This status corresponds to "completed" status in Muqassa.

#### 8.5.2. Settlement instruction management

Settlement instructions can be managed via various ways described below:

*Table 10. Instruction management*

| Function | Description |
|---|---|
| Hold | The instructions are not executed when they are due for settlement. Holding a settlement instruction can be achieved in two ways:<br>• Updated by the Custody Member on the instruction<br>• Apply an account level setting where all instructions related to the account will get an automatic hold status |
| Release | The instructions will be executed when they are due for settlement. |
| Cancel | Cancellation of instruction (Done if one Custody Member requests and the other Custody Member accepts. Cancellation is only allowed for independent custody settlement instructions.). |
| Priority | Settlement instructions with higher priority is executed before others. |
| Partial Status | Settlement instructions are partially settled considering available balance. |

- **Hold/Release:** If either party of the settlement instructions (i.e. the delivering Custody Member or the receiving Custody Member) puts the settlement instructions on hold, the settlement instruction is not executed by Edaa.
- **Priority:** There are four priority levels (listed below from highest to lowest). Only priority #3 and #4 are available for Custody Members:
  - Reserved priority: reserved for Edaa (i.e. corporate actions related settlement instructions).
  - Top priority: Reserved for Muqassa's trade related settlement instructions.
  - High priority: Custody Members can assign / update the priority level of their settlement instructions to high priority from Normal.

- Normal priority: The default priority level.

- **Partial Status:** Both sides of the settlement instructions (i.e. the delivering and receiving sides) must set the partial indicator flag to enable partial settlement. Custody Members can apply and remove partial indicator flag on individual settlement instruction before settlement. Reversal is also possible; remaining portion can settle in full.

### 8.5.3. Instruction Validation

Edaa validates all settlement instructions upon receiving the instruction from Muqassa or participants. Invalid settlement instructions are rejected. Edaa rejects instructions due to following reasons:

- Instructions that involve foreigners buying Makkah/Madinah securities.
- Instructions for accounts, which have statuses of suspended, restricted by regulators, account does not exist, etc.

### 8.5.4. Settlement Instructions by Muqassa

Listed and unlisted security trades concluded in the Exchange are routed to Muqassa for clearing. Muqassa creates matched settlement instructions and sends those to Edaa for settlement. Edaa notifies Muqassa upon the completion of settlement instructions.

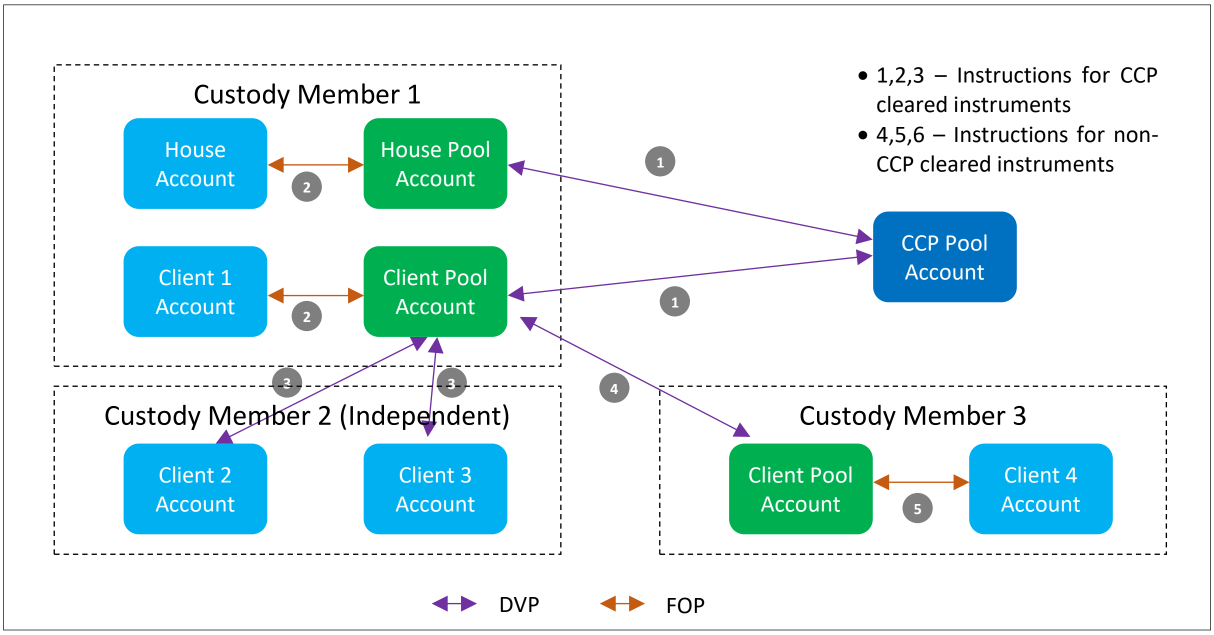



*Figure 8. Instructions for CCP and non-CCP cleared securities*

Trades are settled through Exchange Member Pool accounts. To achieve this, every Exchange Member must have two pool accounts (for the settlement of house and client trades separately) at a Custody Member. CCP is a member in CSD system. CCP pool account is used for CCP cleared settlement obligations. Each settlement position account at Muqassa is linked to a pool account at the CSD.

All DVP instructions settle with predefined batches during SARIE working hours. FOP instructions, on the other hand, settle on a real-time gross basis.

### 8.5.5. Settlement Instructions by Custody Members

In order for Edaa to process instructions generated by Custody members, the instructions should be matched by the counterparty Custody member. Following conditions apply for such instructions:

- If instruction includes a change in beneficial owner of a security, then it can only settle with Edaa approval.
- Following instructions are exempted from the abovementioned condition:
    - Collateral transactions
    - Security borrowing and lending
    - Murabaha
    - Corporate actions (subscriptions, issuance, redemption, conversion/cancellation of depository receipts)

Matching criteria for the instructions are specified below:

*Table 11. Matching criteria for instructions*

| Field | Potential Values | Notes |
|---|---|---|
| Securities Movement | Receive, Deliver | Opposite sides should match |
| Payment Type | FOP, DVP | |
| ISIN Code | | |
| Trade Date | | |
| Settlement Quantity | | |
| Intended Settlement Date | | |
| CSD of Delivering Party | | CSD of counterparty have to match if provided |
| CSD of Receiving Party | | |
| Delivering Party | | |
| Receiving Party | | |

| | | |
|---|---|---|
| Transaction Type | | |
| Currency | | Required for instructions involving payment |
| Settlement Amount | | Required for instructions involving payment |
| Credit/debit indicator | Credit, Debit | Opposite sides should match |
| Opt out indicator | | Optional (have to match if provided by one party) |
| Cum/Ex indicator | | Optional (have to match if provided by one party) |
| Common reference | | Optional (have to match if provided by one party) |
| Client of delivering party | Investor ID | Optional (have to match if provided by one party) |
| Client of receiving party | Investor ID | Optional (have to match if provided by one party) |
| Securities account of delivering party | | Optional (have to match if provided by one party) |
| Securities account of receiving party | | Optional (have to match if provided by one party) |

## 8.6. Cash Settlement

Instructions which do not require cash settlement (FOP, DWD) settle real time throughout the day. Cash settlement related instructions (DVP, PFOD) settle with batches during the day. For cash settlement, there are two different type of batches that run intraday in specified timings for each:

- **CCP batch:** For the settlement of CCP generated instructions including the instructions originating from cleared and non CCP cleared trades.
- **CSD batch:** For the settlement of CSD generated instructions including tradeable rights, subscription and SBL.

Cash Agent relation with Custody Members are defined via cash agreements. Agreements are shared by Cash Agent and Custody Member to Edaa. The Custody Member pays its cash obligation or receives its cash right through its Cash Agent. This include cash obligation/rights related to trades, SBL, tradeable rights, etc. During batches Edaa direct debits or direct credits the Custody Member's cash agent.

The Cash Agent sets a settlement cap (i.e. max cash limit) on the Custody Member. This cap has two settings:

- **Main setting:** Set/update the settlement cap and will become effective the following day and persist cross days.
- **Intraday setting:** Used when Cash Agent wish to provide additional cash to the Custody Member during the day. This reset to zero the following day.

Edaa only direct debits the Cash Agent account up to the available headroom.

$$Availible\ Headroom = Settlement\ Cap - Debited\ Casd + Credited\ Cash$$

The utilization of the settlement cap is reset daily.

## 8.7. DVP Settlement

Edaa attempts to settle all instructions where the intended settlement date equals current date or earlier and have the release status. The goal is to execute all settlement instructions in the first batch if securities and cash are available. If there are not enough securities and/or cash, Edaa tries to execute the unsettled settlement instructions in subsequent batches upon the availability of securities and cash.

Securities transferred to Exchange Member settlement pool accounts are reserved to settle the obligations of the Exchange Member against Muqassa (if any). Excess securities in the Exchange Member settlement pool accounts are used to settle the obligations against Exchange Member clients.

Securities transferred to Exchange Member settlement pool accounts are reserved to settle the obligations of the Exchange Member against Muqassa (if any). Excess securities in the Exchange Member settlement pool accounts are used to settle the obligations against Exchange Member clients.

There are different batches for CCP instructions and CSD instructions with different timings. Edaa can also setup an exceptional batch if required.

## 8.8. Corporate Actions

### 8.8.1. Overview

Corporate actions entitlements are calculated and reported to member on record date (ex-date+1). Settlement of security entitlements happens at the following business day. Entitlements are determined and distributions are made on CSD account level (not investor level).

Corporate action timeline simulation event is as follows:

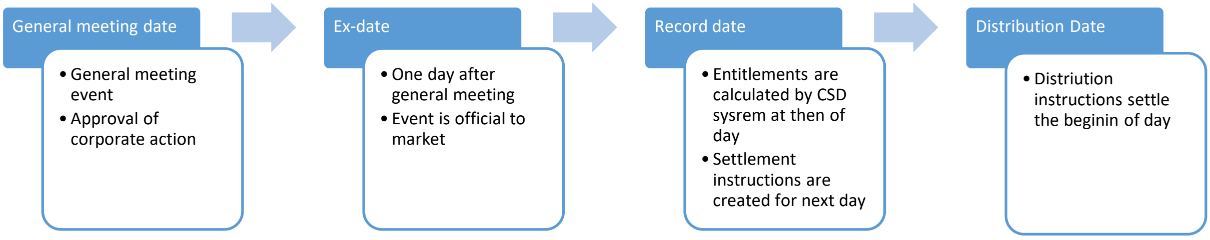



*Figure 9. Corporate action timeline*

Any fractions due to corporate action can be compensated by issuers using one of the following methods below:

- Compensation rump offer sale price
- Compensation by reference price
- No compensation

#### 8.8.2. Tradable rights

Tradeable rights event is captured in 3 different corporate action steps:

- Rights distribution
- Exercise of rights (9 days – settles DvP)
- Conversion of subscribed rights to shares

Custody members subscribe rights with same day (T+0) settlement. Investors have 3 options for exercise event after ex-date, subscription (9 days), sale of rights (6 days), lapse/no action (results to issuer compensation).

Lapsed rights and fractions are transferred to Lead Manager account for rump offering. After the sale of rights to other investors issuer compensate investors.

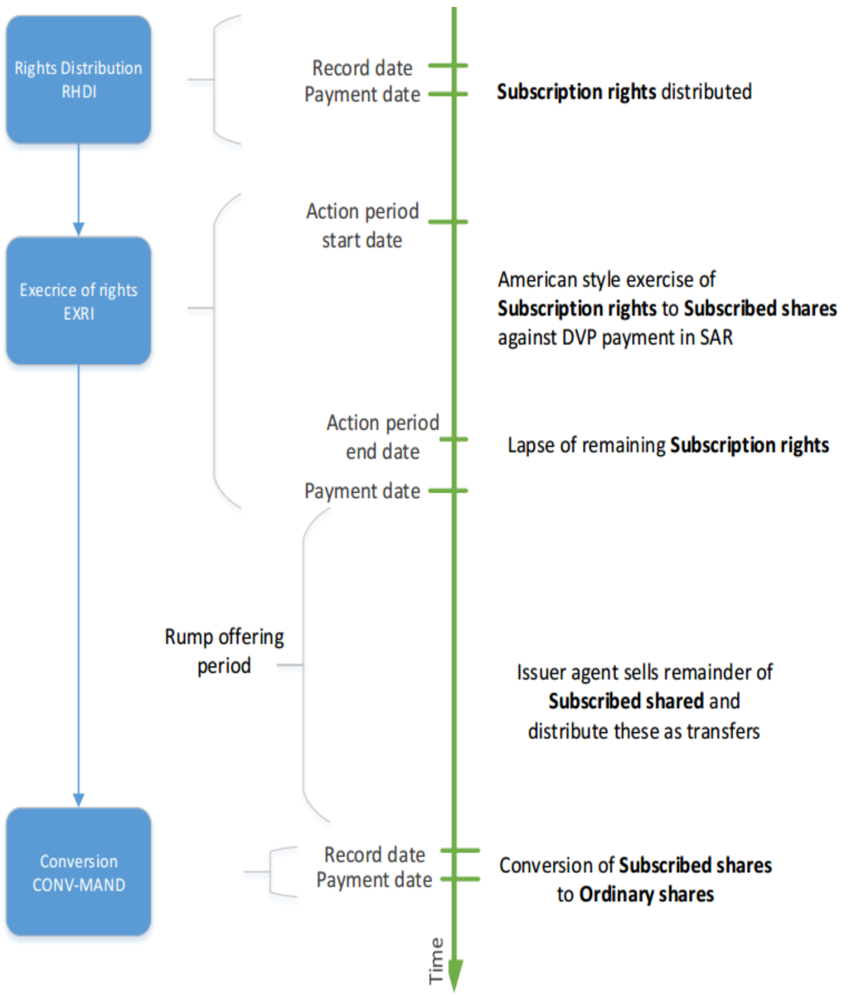



*Figure 10. Rights subscription timeline*

### 8.8.3. Initial Public Offering - IPO

Lead manager shall provide either subscriber securities account number or investor details (Investor ID) of a specified Edaa member. Investor creation and securities account creation must be completed before IPO file upload.

Securities which cannot be transferred to investor account are kept at distribution account. Any missing information which results to unsuccessful settlement shall be completed by lead manager then settlement must follow with new file upload.

IPO settlement instructions can be created on FoP or DvP basis (based on issuer`s choice). Settlement follows the same mechanism as explained in Securities Settlement section. All IPO DvP instructions are created with “hold” status and settlement happens following Custody Member’s release of the instructions.

## 8.9. Ownership limits

Individual and group ownership limits defined by regulation are reported by Edaa and published on the Saudi Exchange website. There are 3 different types of ownership limits:

1. **Individual ownership limits:** Limits defined per an investor of a particular type/nationality, for example, a Qualified Foreign Investor (QFI) cannot own more than 10% of the company;
2. **Group ownership limits**: Limits defined per a group of investors of a particular nationality/type, for example, a foreign ownership cannot exceed 49%;
3. **Mecca and Medina restriction:** A complete prohibition of foreign ownership for companies from Mecca or Medina.

First two type of ownership limits are calculated against the consumption and violations are determined based on settlement timing (Last-In-First-Out-LIFO). Investors are notified via their custodians to divest excess amount of securities. On the other hand, the last type of limit is controlled by CSD on settlement level and such settlement instructions are rejected.

## 8.10. Securities Borrowing and Lending (SBL)

Securities borrowing and lending opening and closing contracts settle on DVP basis (principal asset and collateral). Collateral can be cash in SAR or security. SBL instructions are submitted by participants to Edaa. After matching, Edaa generates securities and collateral instructions. Custody Members can top up or withdraw collateral during lifecycle of contract.

Edaa notifies Custody Members for corporate action events during the course of the SBL. Corporate action claim instructions can be created by Custody Members., Settlement of SBL follows the same mechanism defined in Securities Settlement section.

## 8.11. Collateral Management

Collateral is transferred as a change of the beneficial ownership. Participants can transfer collateral to/from Muqassa. Transfer of collateral to Muqassa accounts is accepted by Edaa only if the sender account Investor ID is matching with the interested party attribute in the destination account. If collateral needs to be transferred to an omnibus collateral account at Muqassa, this transfer can only happen through transitory collateral accounts at Edaa. In this case, the securities need to be transferred to the transitory collateral account and then from there to the Muqassa account. Withdrawal of collateral can be done directly from Muqassa.

## 8.12. Pledges

Custody Members register pledges either unilaterally or bilaterally (pledge beneficiary can be an account at another Custody Member). Custody Members can release or execute pledge. Corporate actions benefits, excluding tradeable rights, are included in pledge based upon custodian's choice at registration.

## 8.13. Restrictions

Edaa can restrict holdings upon the request of the authorities (i.e. court order) or issuers (i.e. founders, board members). Corporate action benefits can also be restricted depending on the type and nature of the request.

## 8.14. Messaging

ISO 15022 messages are used for instructions, responses and notifications aligned with global securities financial messaging practices. Message flows to custodians either triggered by CSD internal events (i.e. corporate action), CCP instructions (trade settlement instructions) or response based (i.e. settlement instruction insert by Custody Member).