

# Default Strategy

## Fixed Income

NASDAQ OMX Clearing

Version 1.0

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## Revision History

Version	Comment	Date
1.0	First version for external and internal distribution	2013-04-08

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## Introduction

The Default Strategy for Fixed Income contains detailed instructions issued by the NOMX Clearing's Default Committee ("DC") in case of a default of a Member or Client with cleared positions in Fixed Income Derivatives.

The Default Policy states that the Default Strategy for respective asset class shall contain instructions for how to **risk assess the portfolio** and a description of **hedging methods**. Moreover close out arrangements and the available **means of execution** shall be described and the strategy shall contain an updated **market maker contact list**.

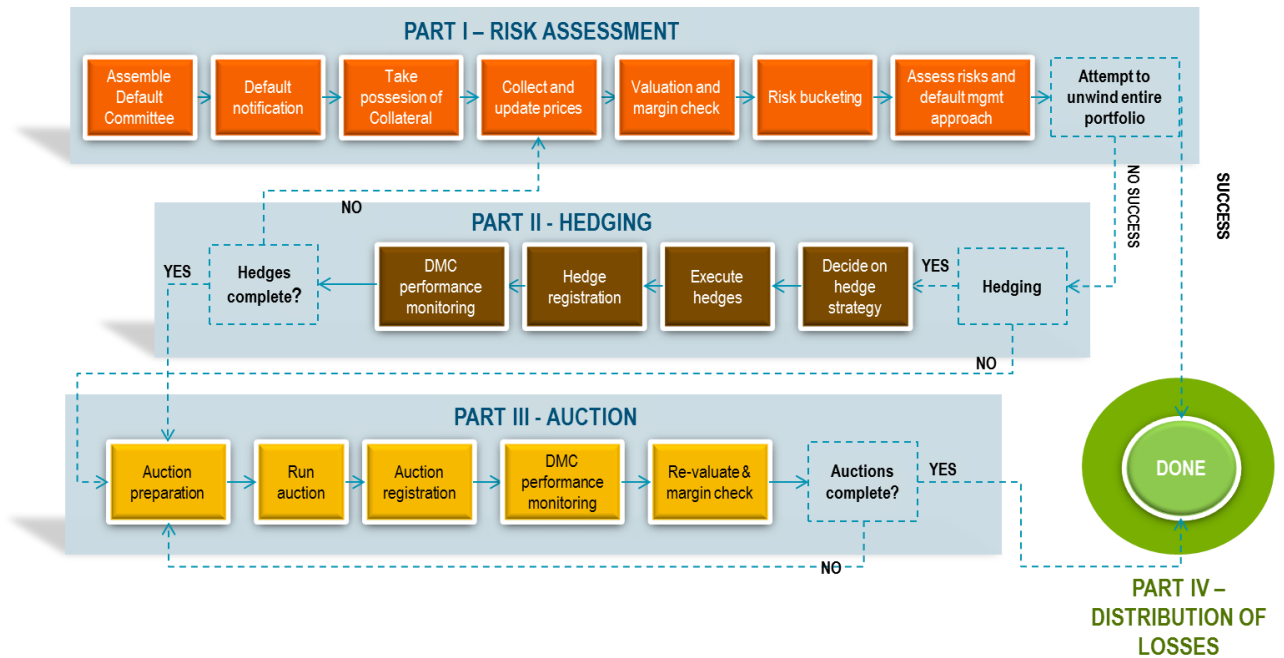
Within Nasdaq OMX's Nordic Fixed Income derivatives offering several market models co-exist, and the default strategy takes this into account. Therefore, the repo-transactions have a separate strategy. For non-repo derivatives the strategy will depend on if the defaulted counterparty is clearing Generic Rates Instruments or not. In the former case its default will be covered by the Default Management Commitment (DMC) entered into by Nasdaq OMX and the market makers in the Nordic OTC rates space. However, the default process is the same no matter if the portfolio includes OTC rates instrument or standardized fixed income derivatives.

A default of a counterparty covered by the DMC will trigger the commitment's special arrangements where the signers are obliged to provide the clearinghouse with prices on hedges and to participate in auctions where the defaulted counterparty's portfolio is sold off. An additional feature is the concept of DMC Dealer. The signers of the DMC jointly decide on a number of fixed income dealers who will be sent to Nasdaq OMX in the event of a default in order to facilitate the process.

The process from Nasdaq OMX's point of view will be the same regardless of whether the defaulted entity is covered by the DMC or not.

## Overview of default management process

The Default Management Process has three distinct parts: Risk Assessment, Hedging and, when needed, Auctioning. All of these three phases contain a number of specific measures, as outlined in the picture below.



Directly after a default, the first phase of Risk Assessment strives toward giving the Clearinghouse a clarified picture of the market risk it is now exposed to. The themes of this phase will initially be communication and damage control; default notifications will be sent to external counterparties, the Clearinghouse will take control of the collateral pledged by the defaulted counterparty and the external users will be barred from the defaulter's accounts. Subsequently the Clearinghouse will refresh its market data if needed and re-value the portfolio. A risk assessment will be made of the portfolio, the result of which will point to possible approaches to default management. Before continuing to the Hedging phase, the Default Committee will consider if it would be possible to unwind the entire portfolio. The first part of the Hedging phase aims to devise a hedging strategy. If suitable, the Clearinghouse will seek the input from external counterparties, routines for which are established through the Default Management Commitment for clearing of Generic Rates Instruments. The hedges will then be executed by Nasdaq OMX personnel towards external market makers and registered in the clearing system. All through this phase the portfolio's risk and P/L will be tracked in order to determine when the portfolio can be deemed to be fully hedged and fit for auction.

In those cases where the hedging does not equate to the closing down of the portfolio, the last phase of the Default Management Process will be the Auctioning phase. If the portfolio only contains standardized instruments without optionality, all of the positions in the portfolio have most likely been closed down one after another in the Hedging phase and no auction is necessary. But for swap portfolios and also for IRGs, an auction of the portfolio (as a whole and/or in parts) is the most plausible approach toward closing down the defaulted counterparty's portfolio. The Clearinghouse has clear procedures in place for distributing information about the portfolio, which will be accounted for below.

## **PART 1 - Risk assessment of the portfolio**

Nasdaq OMX Clearing, in its role as a clearinghouse, performs regular risk calculations and valuations of all its positions. In a default situation the clearing system will be used for valuation of trades, and for monitoring how much of the pledged collateral has been used by the costs and P/L of the portfolio. The first steps that will be taken after a confirmed default is the communication of the event to external stakeholders and a number of pre-emptive measures.

### **ASSEMBLE THE DEFAULT COMMITTEE**

The very first step in any Default Management Process is the assembly of the Default Committee.

The Default Committee is the sole decision making entity in the Clearinghouse's default management process. It will delegate and mandate its tasks to individuals and departments within the organization, but ultimately any step taken in the process as well as the final outcome is the responsibility of the Default Committee. In this document, the points in time where Committee decisions are made, delegated or not, will be highlighted throughout the text.

The Default Committee consists of the following ordinary members:

- The President of Nasdaq OMX Clearing
- Chief Risk Officer
- Head of Clearing Operations
- Head of Legal Nordic/Baltic
- Treasury Non-US
- Global Risk Management representative

Other Clearinghouse personnel can be invited as seen fit.

The President of Nasdaq OMX Clearing acts as Chairman of the Default Committee, and together with the CRO makes the decisions in the Committee. If the Chairman and the CRO disagree on which action to take, The Head of Legal has the casting vote.

### **DEFAULT NOTIFICATION**

One of the main responsibilities of the Default Committee throughout the default process is communication. Specifically, default notifications will promptly be sent to the following recipients:

- The market, through the distribution of an "Exchange Notice"
- The defaulted counterparty
- The Regulators and the Central Bank
- The participants in any relevant Default Management Commitments or Market Maker Agreements.

The Default Committee will clarify who is responsible for the communication.

### **TAKE POSSESSION OF COLLATERAL**

Upon the notification of the Default Committee, the Clearinghouse will take possession of the collateral provided by the defaulted counterparty. Treasury non-US is responsible for using the collateral for meeting the liquidity needs of the Clearinghouse in relation to the default.

## COLLECT AND UPDATE MARKET PRICES

The clearing system is updated with new market data at specific times during the day. In a default situation it will be of interest to update the prices with a higher frequency in order to continuously monitor the portfolio's P/L and risk. Typically, if a considerable amount of time has passed since the last scheduled update and the market is open, the Clearinghouse will update the market data before initializing the quantitative risk assessment. During the default process, the Clearinghouse will strive to update the market data each time it has executed and registered a hedge strategy.

## VALUATION AND MARGIN CHECK

Several "margin runs" – batches of logic within the clearing system which result in updated margin requirements – are scheduled hourly throughout the course of a normal business day. The Clearing house also has the possibility to manually trigger additional margin runs in case it is deemed necessary. The clearing system's ordinary calculations of market values and margins will be used to monitor the progress of the default process.

## ASSESS RISKS AND DEFAULT MANAGEMENT APPROACH

Nasdaq OMX has developed a computational framework for handling all the additional analysis needed in a default situation. After each margin run, the resulting figures are imported into this application, and additional risk measures are calculated.

### Non-repo transactions

For transactions other than repos, the general risk measure will be the potential value change resulting from an upward shift of the relevant yield curve by one basis point. Nasdaq OMX refers to this entity as DV01 (short for delta value for 1 basis point yield curve shift), and it is determined according to the following principles:

Type of Instrument	Application of stress
Generic Rates Instruments Swaps, OIS, TM FRA (cash-collateralized derivatives)	1.) Swap Curve DV01 - 1 basis point add on to forecasted rates. 2.) OIS Curve DV01 – 1 basis point upward parallel shift of OIS curve.
IMM FRA, RIBA, FRA Options	1 basis point add-on to forecasted rates.
Bond Forwards, Bond Forward Options	1 basis point add-on to market rate.

In addition to the DV01 per instrument calculated as defined above, Nasdaq OMX will also calculate the benchmark DV01s for Generic Rates Instruments. This means calculating the effect on the valuation originating from a stress applied to only one of the benchmark instruments used in building the curve. This will be done both for the forecasting curve and the discounting curve.

The Clearinghouse will also calculate the sensitivity of the portfolio to shifts in the yield curve, as expressed by the first three principal components (shift, slope and curvature).

In this way, a SEK denominated Generic Rates Instrument will carry numerous risk measures; a DV01 in the 3M Stibor forward curve, a DV01 in the SEK OIS curve, one DV01 in regard to each instrument used in the construction of the 3M Stibor curve

and the SEK OIS curve, as well as one sensitivity measure toward changes in each of the three principal component.

A central part in the risk assessment of the portfolio will be the overview of these sensitivities summarized per curve.

With the DV01 and PC-sensitivities as risk measures, an assessment of the risk in the portfolio will take in consideration at least the following aspects:

- *The size of the risk* – Given the risk measures of the portfolio, its relative size will be assessed to be used in the further considerations as to which actions should be taken. For example, a portfolio with “large” directional market risk might need to be hedged using several trades executed over a sequence of days, where as a “small” risk in a portfolio indicates that a more aggressive approach can be used in hedging.
- *Off-setting risks* – Trades and positions in different directions can have resulted in margin off-set as a result of the correlation benefits offered by the Clearinghouse. These groups of “spread trades” need to be hedged and closed down near to simultaneously as not to unlock risks for which the Clearinghouse has not demanded collateral.

If the defaulted counterparty was clearing Generic Rates Instruments, the DMC Dealers will aid the Clearinghouse in the risk assessment of the portfolio. The DMC Dealers have a strictly advising role. Their opinion is of high interest to the Clearinghouse as it can thereby test the validity of the measures it plans to take.

#### Repo Transactions

The risk assessment of repos is based on the information calculated by the clearing system. The initial margins and the sizes of the trades will be used to determine in which order the repos should be closed down.

### ATTEMPT TO UNWIND THE ENTIRE PORTFOLIO

At this stage, having formed a clear view of the risk in the defaulted portfolio, the Clearinghouse will always consider the possibility of a sell-off of the entire portfolio. Its freedom of action might be hampered by Default Commitments and Market maker agreements applying to the portfolio. The DMC for Generic Rates Instruments states for example that no details of the portfolio may be communicated to parties other than the signing members during the first days of a default. Should an opportunity present itself the Clearinghouse will seek exemption from such restrictions.

Potential counterparties in a complete unwinding of the portfolio might for example be the bankruptcy administrator, the house-bank of a defaulted client, fund administrators with certain interests, etc.



## PART 2 – Hedging

The hedging of the defaulted portfolio is critical for the Clearinghouse's chances to close down the portfolio within the initial margin that was posted by the defaulted counterparty.

### DECIDE ON HEDGE STRATEGY

#### Non-repo transactions

For transactions other than repos the Clearinghouse can use any combination of instruments that it clears to hedge the market risk of the defaulted portfolio. For the purpose of exploring the effects of different hedge proposals a Fixed Income Hedge Calculator has been constructed which enables the simulation of different hedge strategies and their effects on the risk of the portfolio. The ultimate goal of the hedging will be to reduce the portfolio's DV01 per yield curve, per standardized instrument and, where applicable, per benchmark instrument to zero.

A relaxation of this goal might be provided by offsetting positions which can come in two variants:

- Spread positions between different yield curves, where the correlation between two curves is deemed to be strong enough. For example, a 2 year bond forward in one Swedish mortgage institution might be deemed to be hedging another 2 year bond forward in another Swedish mortgage institution.
- Spread positions within a certain curve. This is mostly applicable to the Generic Rates Instruments, where a large swap portfolio might present off-setting benchmark DV01s for the 4 and 5 year segments for example.

If the defaulted counterparty's portfolio is covered by the DMC the final step in the process is likely to be an auction in which the portfolio is sold off. The DMC Dealers will especially aid the Clearinghouse to decide when a portfolio is sufficiently hedged to be fit for auctioning.

While not necessarily directly involved in the work of developing a hedge strategy, the Default Committee will need to approve the proposed strategy before it can be executed. As a basis for their decision, the Default Committee will need information about the approximate hedging cost.

In the hedging process, other than aiding the Clearinghouse in identifying hedging strategies, the DMC Dealers will advise the Clearinghouse on which spreads it is likely to meet in the markets. Using this information an approximate hedging cost can be calculated and presented to the Default Committee. The DC can then mandate clearinghouse personnel to execute on the hedge strategy under the provision that the prices executed on are within a certain spread from the observed mid-price.

#### Repo Transactions

For repo transactions, the hedging will take the form of replicating trades. Nasdaq OMX will enter into bond forwards and repo transactions with market makers in order to close down the portfolio of repo transactions. The process therefore involves no calculations of indirect hedges.

### EXECUTE HEDGES

Nasdaq OMX has the following arrangements in place for executing on a hedge strategy.

### Non-repo transactions

For transactions other than repos, the procedure will be to reach out to several market makers simultaneously and to execute the hedges on the best price available. A special room has been prepared for this purpose, containing 4 telephones with recorded lines. Once the DC has given its mandate to execute on the hedge strategy to the hedge executor, he/she will lead the hedge participants in the process of calling out to market makers and asking for quotes on hedges that form part of the hedge strategy. The hedge executor will supervise the incoming bids and decide on which bid to strike, and he/she will be the one who finally confirms and executes the trade with the external counterparty.

In the case that the defaulted counterparty's portfolio is covered by the DMC, the DMC participants will be motivated to provide prices on hedges by their part in the Loss Sharing Pool.

If the default counterparty did not clear Generic Rates Instruments, the default will not trigger the DMC. No DMC Dealers will arrive at Nasdaq OMX, and the Loss Sharing Pool will be protected. Although the same process will be used, there is a lower incentive for the market makers to aid the Clearinghouse in the process.

### Repo Transactions

The market makers agreement of the repo transactions states that the market makers shall provide the Clearinghouse with prices on bond forwards and repo transactions in the case of a default of one of the counterparties clearing repos. The internal brokers are trained in executing repo transactions and will receive pre-printed trade instructions from Risk Management during the default process.

## HEDGE REGISTRATION

Apart from providing tools for analysis, the Fixed Income Hedge Calculator also contains functionality for creating files describing the executed hedges, which can be imported into the clearing system. In this way the operational risk in the registering is reduced. The executed hedges will be registered between Nasdaq OMX Stockholm AB and the corresponding bank, and mirroring trades will be registered between Nasdaq OMX Stockholm and the defaulted account.

### Repo Transactions

The bond forwards and repo transactions made in order to close down a defaulted repo portfolio will be registered manually as they are executed.

## DMC PERFORMANCE MONITORING

In case that the default is covered by the DMC for Generic Rates Instruments, or another legal arrangement with built in incentives or sanctions related to the degree of participation in the default process, the Clearinghouse will monitor how well the signers perform.

For example, in the current DMC for Generic Rates Instruments, every hedge transaction executed between the Clearinghouse and a signer of the DMC will result in a partial protection of that participant's contribution to the Loss Sharing Pool. The relative size of the protection is determined by proportion between the initial margin of the hedge contracts at the time of execution (seen in isolation) and the total initial margin of the defaulted counterparty's portfolio. The Clearinghouse will therefore calculate the initial margin of each hedge trade or package for future reference.

After the hedges have been executed, the DC will evaluate if the portfolio can be deemed as hedged and fit for auction. If DMC Dealers are present, their views will also be taken into account.

## Part 3 – Auction

If a defaulted portfolio contains swaps and/or IRGs it is probable that the Hedging phase will not suffice to close down the defaulted counterparty's positions. An auction is a process where the Clearinghouse can receive bids from several counterparties and sell the portfolio to the highest bidder. Participants in the DMC are expected to participate in the final auction where the portfolio of Generic Rates Instruments is sold off. They have to show themselves capable of participating in such an auction and in possession of the technical means to process the extract files that the Clearinghouse will distribute in order to describe the portfolio.

### AUCTION PREPARATION

Once the DC decides that the portfolio has been sufficiently hedged, the planning for the auction can start. The parameters to be decided are the timing of the auction and the possible division of the portfolio into sub-portfolios.

### RUN AUCTION

The auction will start with the Clearinghouse distributing extract files describing the defaulted portfolio to all participants in the auction. The files will be distributed after EOD and in addition to positional information they will contain the Clearinghouse's valuation of the trades. The Clearing house will communicate three specific points in time:

- A dead-line before which the participants must communicate if they can't reproduce the Clearinghouse's valuation.
- A dead-line for the participants for providing bids in the auction.
- A dead-line before which the Clearinghouse must decide on which bid(s) to sell the portfolio (sub-portfolio).

There might be reason to divide the portfolio into sub-portfolios, if some of the participants of the DMC are market makers in all instruments. For example, potential participants have explicitly stated their inability to provide prices on IRGs, and in the case that the portfolio contains such instruments with optionality a sub-portfolio without such instruments has to be created for all to be able to participate.

The bids shall be provided by email, and be confirmed by telephone. The dead-line applies to the electronic format of communication.

The Default Committee will convene at the time of the expiration of the dead-line for providing bids, and promptly decide on which bid(s) to sell the portfolio. Specifically, the DC will consider whether any combinations of bids for sub-portfolios would result in a more beneficial bid for the total portfolio than what have been received. The winning bidder(s) will be informed by telephone and the trade(s) confirmed by email.

### AUCTION REGISTRATION

The Fixed Income Hedge Calculator's functionality for creating files intended to be loaded into the clearing system will be used. As a portfolio of Generic Rates Instruments can contain thousands of trades, automation at this stage is critical. The sold portfolio will be registered between Nasdaq OMX Stockholm AB and the corresponding bank, and mirroring trades will be registered between Nasdaq OMX Stockholm and the defaulted account. At the end of a successful auction the account of the defaulted counterparty will therefore be empty.

### DMC PERFORMANCE MONITORING

The initial margin of the sold portfolio(s) will be calculated in order to be used for estimating the level of protection of the loss sharing contribution that the buyer of the portfolio has achieved.

### RE-VALUATE AND MARGIN CHECK

As a last step, the market value and margin requirement on the defaulted counterparty's account will be recalculated. If the auction was unsuccessful, there will remain positions on the account, and the Default Committee will decide on further steps. A new auction can be initiated after possibly executing additional hedges.

In the case that there are no longer any positions on the defaulted account, the Auction phase is now completed.

## Part 4 – Distribution of Losses

In the event that the default process results in losses on the part of the Clearinghouse which are greater than the defaulter's pledged collateral, the overshooting losses will be covered by the waterfall. The proceedings for distributing the losses are described in the documentation covering the default fund.

For defaults covered by the DMC for Generic Rates Instruments, special provisions apply in relation to how losses are distributed in the Loss Sharing Pool. Participants that have executed hedge transactions with the Clearinghouse and/or taken possession of trades as a result of the Auction phase, will see their loss sharing contributions partially protected. The degree of protection will be equal to the proportion between the sum of the initial margin of the executed hedges and bought portfolios (calculated in isolation at the time of execution) and the total initial margin of the defaulted counterparty's portfolio at the last applicable margin call before the default.

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## **Appendix 1 – Market Maker Contact List**

Not for public disclosure