Calculation Manual – Nordic Fixed Income

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1   Overview

1.1   Purpose of the Document

This Document describes the mathematical approach used in the computation of Nasdaq Fixed Income Indexes. The objective is to assist index users in understanding the components affecting Index performance.

1.2   Applicability and Scope

The Document shall apply to all Nasdaq Fixed Income Indexes in the Nordic region. This document outlines the various methods used in computing Fixed Income Indexes.

Please note that this document does not detail the index construction or criteria information, as this is presented in each individual Index Methodology, available at
https://indexes.nasdaqomx.com/Resource/Index/Methodology.

2   Pricing

OMRX index components receive their prices from Genium Consolidated Feed (GCF). Bonds are priced in bid/ask yields from participating broker dealers. A mid-yield must be calculated from the valid bid/ask yields from the participating broker dealers and the median mid-yield among the mid-yields from the broker dealers is used in the index calculation. Prior to use in the index calculation, the mid-yield must be converted into a clean price in percentage of par format.

3 Index Calculations

3.1 OMRX

The formula for calculating the OMRX indexes:

$$I_t = \frac{\sum_{j=1}^{n_t}(mv_{j,t} + coup_{j,t}) \times NomVol_{j,t}}{\sum_{j=1}^{n_t} mv_{j,t-1} \times NomVol_{j,t}} \times I_{t-1}$$

where

$I_t =$ Index value at time t

$I_{t-1} =$ Index value at time t-1

$t =$ Current index date

t-$1 =$ Previous index date

$n_t =$ Number of securities included at time t

$coup_{j,t} =$ Coupon for security j at time t

$mv_{j,t} =$ Market value of security j at time t

$NomVol_{j,t} =$ Nominal amount outstanding for security j at time t

Market value, mv, implies the settlement amount based upon the security's prospectus and the applicable interest rate for the security at date t. Calculation of the settlement amount is carried out in accordance with calculation principles for the Swedish Money- and Bond Market, i.e. the following is taken into account:

1. The number of banking days between the expiration day and the settlement day pursuant to practices applicable to the respective securities at any given time, i.e. currently two bank days.
2. With respect to bonds with a coupon, the price is rounded to three decimal places before the accrued coupon interest is added. Rounding shall take place in accordance with the International Security Management Authority (ISMA) principles, where the number five (5) is rounded upwards.
3. Bonds are listed at yield to maturity while Treasury bills are listed at the simple interest rate.
4. Market value, mv, is calculated the morning immediately preceding that day's index calculation, by using the latest interest rate (i.e. the interest rate the day before) for the bonds respectively. In this way, the fact that the market value has increased, due to that another day has passed and that the market value has increased with the accrued interest, is taken into consideration.

3.2 Coupons Payments

Where a coupon is payable the market value of the bond decreases. However, since the coupon payment is payable to the bondholder, no change in the index value would be justifiable. In order to avoid such circumstances, the index is linked pursuant to equation (3.1) above. The index calculation does not take into account record dates, i.e. the banking day which falls five (5) banking days before the coupon date. The index attempts to simulate a passively managed portfolio of bonds and it is therefore assumed that a payable coupon will be re-invested in the index on the banking day with a settlement day which is identical to the coupon payment day. The fact that bonds are traded without coupons prior to such day will not, therefore, affect the index.

3.3 Mortgage Factor

In calculation of selected OMRX indexes (OMRXBOND,, OMRXBOND130 and OMRXTOT) a mortgage factor is used.

Stadshypotek's benchmark bonds are used to represent the total Swedish mortgage bond market.

$$f = \frac{NomVol_{OMRXMORTALL}}{NomVol_{SHB}}$$

where

f = Mortgage factor value

$NomVol_{OMRXMORTALL}$ = Total nominal amount outstanding of all bonds included in OMRXMORTALL

$NomVol_{SHB}$ = Total nominal amount outstanding of Stadshypotek's Benchmark bonds in OMRXMORTALL

3.4 OMRX Treasury Bill Maturity Indexes (30, 60, 90 and 180 days)

$$I_t = I_{t-1} \times \frac{P_t}{P_{t-1}}$$

where

I_t = Index value at time t

I_{t-1} = Index value at time t-1

t = Current index date

t-1 = Previous index date

P_t = Current index price of the Treasury bill.

P_{t-1} = Index price of the Treasury bill at time t-1

3.4.1 Change of Underlying Treasury bill

When the settlement day of the current Treasury bill falls in a new month, the index is calculated based on a new treasury bill. If due to limitations in issuances a Treasury bill maturity is missing, a "fictitious" Treasury bill is created and inter- or extrapolated yield will be used.

Example (90-days Treasury bill)

On the day t, settlement date is t+2.

On 4/28/2020 (settlement date: 04/30/2020) the index is calculated accordingly:

$$I_{28} = I_{27} \times \frac{P_{28,RGKT2007}}{P_{27,RGKT2007}}$$

On 4/29/2020 (settlement date: 05/03/2020) the index is calculated accordingly:

$$I_{29} = I_{28} \times \frac{P_{29,RGKT2008}}{P_{28,RGKT2008}}$$

3.5 Market Capitalization Targeting Approach (MCTA Index)

Bond Indexes are weighted using a market capitalization targeting approach and employ a proprietary, patent pending rebalancing methodology designed to reduce constituent turnover while maintaining the risk characteristics of a market capitalization weighted index.

$$MCTA_t = \frac{Aggregate\ Index\ Market\ Value_t + TodaysTBillsValue_t}{Divisor_t}$$

$Aggregate\ Index\ Market\ Value = \sum_{i=1}^{n_t} \left((p_{i,t} + AI_{i,t}) \times n_t \times PV_{i,t} \right)$

$TodaysTBillsValue_t = CouponPayments + CallPayments + MaturityPayments$

The Index Divisor serves the purpose of scaling such aggregate value to a lower order of magnitude for reporting purposes.

4   Disclaimer

Nasdaq may, from time to time, exercise reasonable discretion as it deems appropriate in order to ensure Index integrity including but not limited to quantitative inclusion criteria. Nasdaq may also, due to special circumstances, if deemed essential, apply discretionary adjustments to ensure and maintain the high quality of the index construction and calculation. Nasdaq does not guarantee that any Index accurately reflects future market performance.

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