

Nykredit Danish Mortgage Bond index

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Marketing communication

Geert Ditlev Kunde, Chief Analyst, gedi@nykredit.dk, +45 44 55 11 08

- The oldest index of Danish covered bonds
- The Nykredit Danish Mortgage Bond Index comprises callable bonds, bullet covered bonds and capped floaters
- Only bonds with an outstanding amount of over DKK 5bn are included in the Nykredit Danish Mortgage Bond Index

Nykredit Danish Mortgage Bond (DMB) Index was the first index of Danish covered bonds. The index consists of the ten largest bond groups in the Danish covered bond market. The index may include callable, bullet and capped floater covered bonds. The groups are defined on the basis of coupon/interest rate cap and amortisation/maturity profile, and the minimum time-to-maturity must be one year. Bonds are selected based on outstanding amounts, and a bond must normally have an outstanding amount of DKK 5bn to be included in the index.

The Nykredit Danish Mortgage Bond Index (the DMB Index) was the first index to include Danish covered bonds in the portfolio, and the index date is 1 January 1993. The DMB Index is founded on the most liquid covered bonds listed on NASDAQ OMX Copenhagen.

Portfolio criteria

The DMB Index is composed on the basis of the criteria in the right-hand table:

Once the basic selection has been made, the bonds are divided into groups summed up across the individual mortgage banks. Callable bonds and bullet covered bonds are grouped according to repayment profile, coupon and maximum times-to-maturity. Bonds with interest-only periods are divided into groups of up to 10 and 30 years, respectively. Capped floating-rate bonds are grouped according to repayment profile, relative strike level of the embedded cap and maximum times-to-maturity. Grouping according to the relative strike level means that the bonds are sorted by outstanding amount after which the largest bond is picked along with the bonds with the same strike level ± 10 bp. Of the remaining bonds, the largest one is picked again along with the bonds with the same strike level ± 10 bp and so forth until all capped floaters have been distributed. The bonds included in the ten largest bond groups constitute the index portfolio.

In periods with large new issues of covered bonds, relatively large amounts are traded in the new bond series. To ensure that the composition of the index portfolio reflects this phenomenon to some extent, one of the portfolio criteria is that at least two of the bond groups must contain open bond series (no criteria dictates that the bonds should also have a price below par, however). If the ten bond groups do not include at least two open groups, the requirement of an outstanding amount of DKK 5bn is reduced to DKK 1bn for open series. The index will then be composed so that at least two of the ten groups contain open series.

Portfolio criteria of the Nykredit DMB Index

	Portfolio criteria
1	Portfolio is rebalanced on the second trading Tuesday of January, April, July and October.
2	The bonds must carry either fixed rates or capped floating rates. Index-linked bonds and floating-rate bonds are not eligible for the index portfolio.
3	At least two of the bond groups must contain open bond series.
4	The bonds must have an outstanding amount of at least DKK 5bn. If not at least two of the ten largest bond groups have open series, the requirement of an outstanding amount of DKK 5bn is reduced to DKK 1bn for open series.
5	The bonds must be issued by a mortgage bank. Corporate bonds and semi-public bonds issued by eg Kommunekredit and Skibskreditfonden do therefore not form part of the index portfolio.
6	The bonds must be denominated in DKK.
7	The bonds must have times-to-maturity of at least 1 year.
8	To ensure that the Index represents bonds actually issued, Nykredit Markets may adjust the outstanding amount for eg pre-issuance or similar if explicit information in this regard is available. Alternatively, individual bonds may be excluded.

Only very liquid bonds are included in the Nykredit DMB Index.

Source: Nykredit Markets

Calculation of index value

The index value development is calculated on the basis of the change in the portfolio's market value on a daily basis. The market value is calculated on the basis of the official prices quoted by NASDAQ OMX Copenhagen. This is due to the desire for transparency in the calculation of index performance so that the performance of Nykredit's DMB Index can be reproduced (see formulas below). The bonds are weighted at their nominal amounts on the latest rebalancing date.

In the calculation of index performance, redemptions are included at their redemption prices on the day of trading, the value date of which is the payment date. The redemption price is typically 100, but certain types of capped floaters have an extraordinary redemption price of 105.

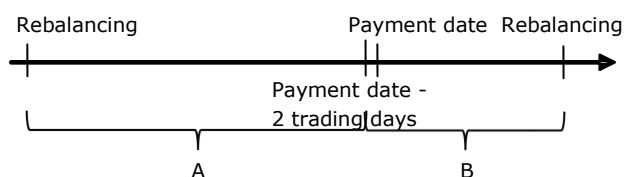
On index portfolio rebalancing, the calculation of index values on the rebalancing date is based exclusively on the "old" portfolio, after which the index is rebalanced. The day after the rebalancing, performance is computed exclusively on the basis of the rebalanced portfolio.

Where to find the Nykredit Danish Mortgage Bond Index
Index and duration developments of Nykredit's DMB Index are available at Nykredit's [website](#) together with the current composition. The Index is also available at Reuters (NYKRED15) and Bloomberg (NYKP).

Calculation formulas

Figure 2 shows the events that impact the index portfolio.

Important events for Nykredit's DMB Index



Besides the impact from rebalancing, the index portfolio changes when the redemptions are effected.

Source: Nykredit Markets

In the period from rebalancing to the payment date (period A), the nominal amounts from rebalancing are used for calculating the index performance, described by the following formula:

$$\Delta Index = \frac{\sum_{i=1}^n (P_i^{new} + A_i^{new}) N_i}{\sum_{i=1}^n (P_i^{old} + A_i^{old}) N_i} - 1$$

where P is the official price quoted by NASDAQ OMX Copenhagen, A is accrued interest, and N is the nominal amount on the rebalancing date.

Redemptions and coupon interest are reinvested in the index on the day of trading for which the value date is the payment date (or the first trading day after the payment date if the payment date is not a trading day), and the nominal amounts are adjusted for redemptions:

$$\Delta Index = \frac{\sum_{i=1}^n (P_i^{new} + A_i^{new})(N_i - U_i) + (I + A_i^{new})U_i + L_i}{\sum_{i=1}^n (P_i^{old} + A_i^{old})N_i} - 1$$

where U is the amount of bond redemptions, I is the redemption price and L is the liquidity from the coupon payments.

From the payment date to rebalancing (period B), the liquidity is placed in the index, and the index performance is thus calculated by using the following formula:

$$\Delta Index = \frac{\sum_{i=1}^n (P_i^{new} + A_i^{new})(N_i - U_i)}{\sum_{i=1}^n (P_i^{old} + A_i^{old})(N_i - U_i)} - 1$$

In period A, the following formula is used to determine the index duration:

$$OABPV_{Index} = \frac{\sum_{i=1}^n N_i \cdot OABPV_i}{\sum_{i=1}^n N_i}$$

where OABPV is the duration of a bond.

The duration of period B is calculated as follows:

$$OABPV_{Index} = \frac{\sum_{i=1}^n OABPV_i (N_i - U_i)}{\sum_{i=1}^n N_i - U_i}$$

DISCLOSURE

This research is non-independent research prepared by Fixed Income & Nordic Research in Nykredit Markets. Non-independent research is a marketing communication and does not constitute independent, objective investment research and is thus not subject to the legal requirements applicable to independent investment research. Therefore, it is not subject to any prohibition on dealing ahead of the dissemination of the marketing communication.

Recommendation and risk assessment structure for government bonds and bonds issued by financial institutions, including covered bonds

Bond recommendations

The research of Fixed Income & Nordic Research generally focuses on isolating relative value in bond and derivatives markets. Therefore, the interest rate and/or volatility risk of the strategy is generally hedged through other bonds or derivatives (swaps, swaptions, caps, floors, etc). In contrast to outright recommendations, our research often includes both a buy and a sell recommendation.

BUY: In our view, the bond is fairly inexpensive relative to comparable alternatives in either the bond or derivatives markets. We expect that the bond will offer a higher return than the alternatives on a horizon of usually three months.

SELL: In our view, the bond is fairly expensive relative to comparable alternatives in either bond or derivatives markets. We expect that the bond will offer a lower return than the alternatives on a horizon of usually three months.

Recommendations on portfolio allocation

The recommendations of Fixed Income & Nordic Research are based on a portfolio investor (long-only investor) in government bonds and bonds issued by financial institutions. Click on the following link to see a [list of all recommendations on financial instruments or issuers disseminated](#) by Fixed Income & Nordic Research in Nykredit Markets over the past 12 months.

OVERWEIGHT: In our view, the return on the bond segment will be higher than the return on the total Danish bond market (Danish government bonds and bonds issued by financial institutions) in the next three months.

NEUTRAL: In our view, the return on the bond segment will be in line with the return on the total Danish bond market (Danish government bonds and bonds issued by financial institutions) in the next three months.

UNDERWEIGHT: In our view, the return on the bond segment will be lower than the return on the total Danish bond market (Danish government bonds and bonds issued by financial institutions) in the next three months.

Distribution of recommendations

The distribution of the direct investment recommendations from Fixed Income & Nordic Research within the past quarter is shown in Table 1 and Table 2. Proportion I is the distribution of our recommendations and it therefore sums to 100%. Proportion II is the share of issuers within each category above for which Nykredit Bank A/S has carried out major investment bank transactions in the past 12 months.

Table 1: Recommendations – fixed income	Proportion I	Proportion II
Buy	50	0
Sell	50	0
Table 2: Recommendations – portfolio allocation	Proportion I	Proportion II
Overweight	0	0
Neutral	0	0
Underweight	0	0
Source: Nykredit Markets		

Historical returns and price developments

To the extent that this material contains information on historical prices and/or returns, reference is made to [historical returns and prices](#) at nykredit.dk, which provides information on price developments and returns for the past five years (or the life of the instrument concerned, if less than five years) of the financial instruments for which Fixed Income & Nordic Research has made direct investment recommendations.

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This investment research was finished and released for distribution for the first time on the date stated on the front page.

Financial models and methods applied

Calculations and presentations are based on ordinary econometric and financial tools and methods as well as publicly available sources. Assessments of Danish callable mortgage bonds are modelled using a proprietary model consisting of a stochastic yield structure model and a statistical refinancing model calibrated to borrowers' historical prepayment behaviour. The models have been approved by the Danish Financial Supervisory Authority.

Unless otherwise specified, prices stated in this research prevailed at 15:40 CET on the trade day before the date stated on the front page.

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Nykredit Markets – Kalvebod Brygge 47 – DK-1780 Copenhagen V – Tel +45 44 55 18 00 – Fax +45 44 55 18 01