1 July 2020

Danish Covered Bond Handbook 2020

This document provides an overview of the Danish covered bond market and its pass-through bonds, including details of the securities underlying the bonds. Until 2007, issuance of Danish covered bonds (mortgage bonds) in Denmark was through specialist mortgage banks, of which the general feature was a pass-through product. A significant revision of the law in 2007 paved the way for non-specialist banks to issue covered bonds as well as higher degrees of freedom in the funding structure of even specialist mortgage banks. However, recent developments show that the share of bonds used to fund mortgage lending in a pure pass-through model by specialist mortgage banks continues to make up the large majority of the Danish covered bond market. The only Danish covered bond issuer that is not a specialist mortgage bank is Danske Bank.

Covered bonds issued out of Denmark fall into two categories: traditional Danish mortgage bonds (the pure pass-through product) and euro-style covered bonds in a jumbo format (similar to what exists in euroland). The pass-through products are tapped on a daily basis in the domestic market and comprise one of the largest residential covered bond markets in Europe. Currently, only Danske Bank has established a euro medium-term note (EMTN) covered bond programme and issues euro-style covered bonds similar to those in Germany, the Netherlands, Sweden, Norway and so on.

Specialist Danish mortgage banks can issue covered bonds collateralised by first-lien mortgages secured on real property as set out in the legislation and are the main focus of this publication. On top of this, ship finance institutes can issue covered bonds to fund first-lien mortgage lending secured on ships. Currently, only Danmarks Skibskredit performs lending to the shipping industry.

Chapter 1 briefly outlines why Danish covered bonds are an interesting asset class. Chapter 2 explains the legal framework of the Danish mortgage credit system and the security aspects of Danish covered bonds. Chapter 3 describes the Danish mortgage banks and Chapter 4 provides an overview of the current ratings of each institution and their rated capital centres. Chapter 5 gives a detailed description of the characteristics of Danish covered bonds and Chapter 6 describes the primary and secondary markets.

Moving on to prepayments, Chapter 7 explains how covered bonds can be refinanced and shows different types of remortgaging strategies. Chapter 8 explains how to estimate prepayment rates for callable covered bonds. Chapter 9 gives an overview of investor distribution. Chapter 10 presents different ways of measuring the yield pickup of Danish covered bonds and introduces option-adjusted figures for yield spreads (OAS) and durations. In Chapter 11, we describe bond futures on Danish covered bonds. Finally, Chapter 12 summarises the available data on Danish covered bonds.

For more information on the euro-style Danish covered bond, see the Danske Bank publication *Nordic Covered Bond Handbook – The handbook of the Nordic covered bond markets and issuers*, 4 September 2018.

Analyst
Daniel Brødsgaard
+45 45 12 80 83
dbr@danskebank.dk

Chief Analyst
Jens Peter Sørensen
+45 45 12 85 17
jenssr@danskebank.dk

Chief Analyst
Sverre Holbek
+45 45 14 88 82
holb@danskebank.dk

Chief Analyst
Jan Weber Østergaard
+45 45 13 07 89
jast@danskebank.dk

Contents

1. Why are Danish covered bonds an interesting asset class?

Danish covered bonds are an interesting asset class for various reasons. The bonds are issued under a strong mortgage act and the more than 200-year old Danish credit system has gone through a number of stages and survived several bouts of economic and political turmoil. The levels of repossessed dwellings and loans in arrears have been very low – even in periods of significantly falling house prices. S&P rates Danish covered bonds 'AAA' and they offer a pickup relative to other European 'AAA'-rated covered bonds. The liquidity of the short-dated, non-callable covered bonds is good and at times better than the liquidity of Danish government bonds.

The following details why Danish covered bonds are an interesting asset class.

The more than 200-year old Danish credit system has survived several bouts of economic and political turmoil

In 1795, a very large fire in Copenhagen burned one in four houses in the city to the ground. Funding was needed to rebuild the city but provision of credit was scarce. Lenders formed a mortgage association to provide loans secured by mortgages on real property on the basis of joint and several liability to enhance credit quality.

To fund the loans, the first Danish mortgage bonds were issued and thus a more than 200-year tradition of mortgage bond issuance in Denmark commenced.

Over the past 200-plus years, the Danish mortgage credit system has gone through a number of stages and survived several occasions of economic and political turmoil, including the bankruptcy of the Kingdom of Denmark in the early 19th century and the depression of the 1930s. Every single issued bond has been repaid in full to the investors.

This unblemished record is attributable mainly to the strong legislative framework, which from an early stage in the development of the market has put great emphasis on the protection of the mortgage bond investor by imposing strict limits on risk taking by mortgage banks. In 1850, a long tradition of strict regulation of the activities of mortgage banks commenced with the passing of the first Mortgage Bond Act. The legal framework has been amended several times. However, guiding principles such as the balance and investor protection principles have remained unchallenged (Chapter 2 describes the present Mortgage Credit Act in detail).

In its first 100 years, the Danish mortgage credit sector consisted of many mortgage credit associations, where mutuality was general feature. However, mutuality contributed to a very restricted lending policy, as the most important duty of a mortgage credit association was to safeguard the interests of its members.

At the end of the 1950s, the Danish government took the initiative to establish independent mortgage banks. Commitment to mutuality gradually disappeared and institutions with independent means were established. This resulted in a more liberal lending policy.

Since 1970, Denmark's mortgage credit legislation has seen several reforms. In search of economies of scale, the mortgage credit reform in 1970 introduced a provision for the approval of future new mortgage banks only if there was an apparent need. The number of mortgage banks fell from 24 to seven. Another important change in 1970 was the switch from a three- to a two-tier system – ordinary and special mortgage credit loans. This led to the 1980 reform, which introduced the use of only one tier known as the 'unity' mortgage credit system.

In 1989, deregulation resulting from EU directives enabled commercial and savings banks to establish mortgage banks, formed as limited companies. Traditional mortgage banks were allowed to convert into limited companies. New lenders entered the market and fierce competition ensued, resulting in consolidation within the sector.

Since 2000, the mergers of Danske Kredit, BG Kredit and Realkredit Danmark and that of Nykredit and Totalkredit have intensified competition even further to form the market today. Further, at end-2019 Nykredit bought all the shares in LR Realkredit and BRFkredit changed its name to Jyske Realkredit in 2018 following the merger with Jyske Bank in 2014.

Today, Danish covered bonds secured on real property are issued by a comparatively small number of issuers – at present six, of which five are specialist mortgage banks – adding to the liquidity of the bonds issued. In addition to mortgages on real property, Danish Ship Finance offers ship mortgages. Furthermore, market concentration is high, with Nykredit Realkredit and Realkredit Danmark accounting for 68% of all Danish krone covered bonds issued and 27% of all Danish euro covered bonds issues. The demand for both floating and fixed rate loans in EUR has fallen in recent years as the policy rate in Denmark has been stable and below that of the Euro Area. This also means that mortgage banks which fund mortgages using a pure pass-through principle have decreased their outstanding volumes in EUR. Note, however, that Danske Bank and Jyske Realkredit are both issuing in EURs independently of loan demand and are handling potential currency risks using derivatives. This practice has been under scrutiny from the regulators and a 'best practice' document was presented in June 2018[1] underlining the Danish FSA's stance that specialist mortgage banks should not drift too far away from the pure pass-through principle even if allowed.

Table 1. Volumes and market shares of Danish mortgage banks mid-June 2020

	DKK bonds		EUR bonds		Total volume	
Issuer	Volume (EURbn)	Share (%)	Volume (EURbn)	Share (%)	Volume (EURbn)	Share (%)
Nykredit Realkredit	167.1	41.8%	6.2	24.3%	166.8	40.7%
Realkredit Danmark	105.3	26.2%	0.8	3.0%	101.5	24.8%
Nordea Kredit	55.1	14.2%	0.8	3.0%	55.9	13.5%
Jyske Realkredit	45.3	10.6%	3.0	11.7%	46.3	10.7%
DLR Kredit	22.9	5.6%	0.3	1.2%	23.2	5.3%
Danske Bank	0.8	0.2%	13.5	52.8%	14.3	3.5%
Danmarks Skibskredit (ships)	4.9	1.3%	1.0	3.9%	5.9	1.4%
Total	**383.9**	**100.0%**	**25.5**	**100.0%**	**409.5**	**100.0%**

Note: For Jyske Realkredit and Danske Bank also including EUR issues registered on Euroclear.
Source: Danske Bank

Danish covered bonds are issued under a strong mortgage act

Danish covered bonds are issued under the Danish mortgage act. One of the central elements in the Danish mortgage act is the balance principle. The balance principle requires that there is a match between the inflow and the outflow of a mortgage bank and limits the amount of risk (interest rate, volatility, FX and liquidity) that a Danish mortgage bank can undertake. See Chapter 2 for more details on the Danish mortgage credit system.

In addition, Danish mortgage banks must observe capital requirements as defined in applicable EU Directives, i.e. the capital base of mortgage banks must be a minimum of 8% of risk-weighted assets.

[1] 'Hvor meget balance skal der være i realkreditten' – Finanstilsynet, 2018.

Another key feature of the Danish system is very well-defined property rights through a general register of all properties in Denmark. The title and land registration systems ensure that ownership and encumbrances on individual properties are easily identified and that the information is available to the public. Furthermore, if a borrower defaults on a payment, the mortgage bank can take over the house and the compulsory sale procedure would ensure that a mortgage bank could sell the house in the real estate market or through a forced sale. The period from default to a forced sale being completed may be as short as six months. Hence, the Danish title number and land registration systems add investor protection.

Danish covered bonds are rated 'AAA' by Standard & Poor's

Danish covered bonds issued by the major Danish mortgage banks' most traded capital centres are rated 'AAA' by Standard & Poor's (S&P). Each mortgage bank has a range of capital centres and S&P rates the covered bonds depending on capital centres and bond type (SDO/SDRO/RO). The table in the margin shows the current rating for the covered bonds issued by Realkredit Danmark, Danske Bank, Nykredit Realkredit, Nordea Kredit, Jyske Realkredit, DLR Kredit and the ship finance institute Danmarks Skibskredit.

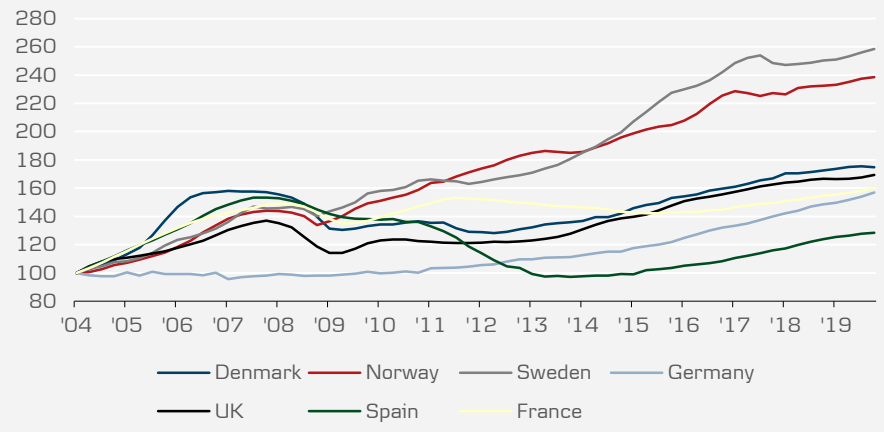
In addition, covered bonds issued out of Realkredit Danmark's capital centres S and T are rated 'AAA' and 'AA+', respectively, by Fitch, and the issuer rating is A.

In 2018 new capital centres were opened on the part of RD (Capital Centre A), Nykredit Realkredit (Capital Centre J) and Jyske Realkredit (Capital Centre S) following a change in the funding model of government subsidised social housing. None of the capital centres are rated and the bonds issued are all with a government guarantee.

Low level of repossessed dwellings and loans in arrears

House prices in Denmark experienced a gradual increase over the decades leading up to the beginning of the financial crisis in 2007. During the financial crisis, house prices fell quite significantly until the beginning of 2009, when we saw a stabilisation in prices (see chart below).

Chart 1. House prices in selected countries 2004-20 Q1 (index 100= Q1 04)



Source: Macrobond Financial, *Danske* Bank

Between the peak in 2007 and Q3 12, house prices in Denmark declined by almost 20%. Over the same period, house prices in Norway and Sweden increased by 24.7% and 9.8%; in Spain and the UK house prices declined by 32.6% and 11.5%, respectively, over this period.

Table 2. Ratings from S&P

Capital centre	Type	Rating
Realkredit Danmark (RD)		A
General Capital Centre	RO	AAA
Capital Centre S and T	SDRO	AAA
Capital Centre A (gov. guar.)	SDRO	N/A
Danske Bank		A
Register C, D and I	SDO	AAA
Nykredit Realkredit (NYK)		A+
General Capital centre	RO	AAA
Capital Centre C, D, G and I	RO	AAA
Capital Centre E and H	SDO	AAA
Capital Centre J (gov. guar.)	SDO	N/A
Totalkredit CC C	RO	AAA
Nordea Kredit (NDA)		AA-
Capital Centre 1	RO	AAA
Capital Centre 2	SDRO	AAA
Jyske Realkredit (JYSK)		A
General Capital centre	RO	AAA
Capital Centre B	RO	AAA
Capital Centre E	SDO	AAA
Capital Centre S (gov. guar.)	SDO	N/A
DLR Kredit (DLR)		A-
General Capital Centre	RO	AAA
Capital Centre B	SDO	AAA
Danmarks Skibskredit		BBB+
General Capital Centre	SMB	A
Capital centre A	SDO	A

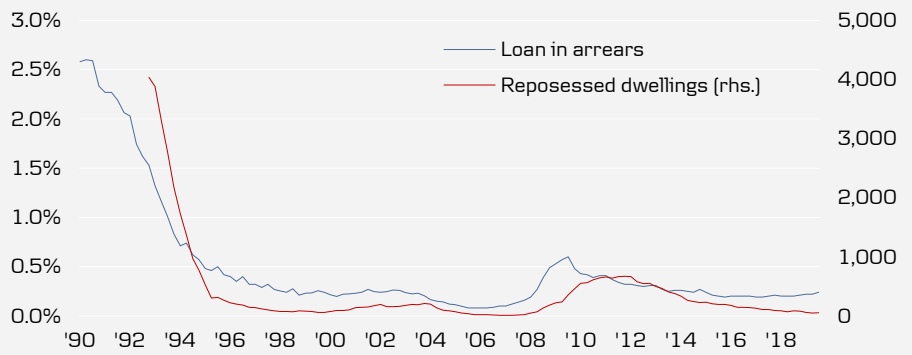
Source: Standard & Poor's, Danske Bank

Despite the significant fall in house prices during the financial crisis, the levels of repossessed dwellings and loans in arrears have been very low. This is due to the low unemployment rate in Denmark and the strong mortgage legislation – the amount of repossessed dwellings usually correlates poorly with house prices but strongly with unemployment rates.

Starting 1 January 2018 new loan loss provision standards was implemented in Danish and EU legislation (IFRS 9), meaning that provisions to a larger degree than previously will come to depend on Expected Credit Losses (ECL) taking into account a range of macro-economic scenarios. This is opposed to previous legislation where a loan wasn't provisioned for until an Objective Evidence of Impairment (OEI) had been noted (which currently corresponds to level 3 in the IFRS 9 framework with a level 1 debtor requiring no provisioning).

Thus, periods of high macro-economic uncertainty (such as during the COVID-19 crisis of H1 20) will be dominated by larger provision charges and thus lead to larger than previous changes in regulatory capital[2]. The Danish FSA estimated before the introduction of the new rules that total provisions among Danish credit institutions would increase by 9-10% leading to a fall in the Tier 1 capital ratio of 25bp[3]. The new legislation, however, only has a limited effect on the balance sheets of Danish mortgage banks, as the new regulation only affects loans valued at amortised cost. By far the largest share of lending among mortgage banks is valued at fair value.

Chart 2. Repossessed dwellings and loans in arrears



Source: Finance Denmark, Danske *Bank*

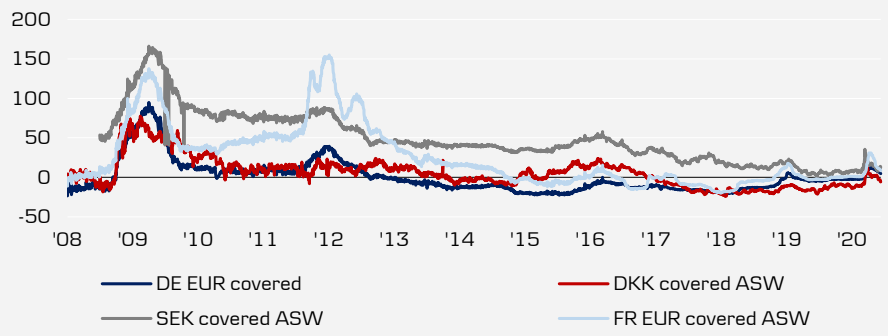
Low spread volatility of Danish covered bonds compared with other European covered bond markets (non-callables)

Over the past few decades, the spread volatility of Danish covered bonds has generally been quite low compared with other European covered bond markets. Spreads on Danish covered bonds widened quite significantly in autumn 2008 due to the increased risk aversion in the market, but compared with other European covered bond bonds, the spread widening in Denmark in 2008 was moderate. Also, the Danish bond market was unaffected by the European debt crisis, as investors used the Danish bond market as a 'safe haven'.

[2] During the COVID-19 crisis, this led the European Commission to adopt a revised text specifying that credit institutions should not automatically increase ECL but make use of expert judgement as well.
[3] 'Nye nedskrivningsregler som følge af IFRS 9' – Finanstilsynet, 2017.

Since 2012, we have seen a significant tightening of (local) asset swap (ASW) spreads on European covered bonds driven partly by the ECB's covered bond buyback programmes (CBPP). Over the same period, the spreads on Danish covered bonds traded in a relatively stable range until 2015, when we saw a temporary widening of spreads. The drivers of the spread widening in 2015 were uncertainty about the impact of regulation (for example, the implementation of the liquidity coverage requirement [LCR] as of 1 October 2015), uncertainty regarding the leverage ratio and risk weights and increased volatility in the financial markets. After the spread widening in 2015, the spread tightening on Danish covered bonds continued and the spreads reached historically low levels in 2018. The COVID-19 crisis in H1 20 brought renewed spread widening to the covered bond segments during March, however spreads returned fairly quickly to pre-crisis levels. Worth mentioning is that the Riksbank in March 2020, for the first time ever, embarked on QE in SEK covered bonds. Even so the subsequent spread tightening in DKK was at the same pace as seen in the SEK market and at the time of writing the longer lasting effects on risk premiums are yet to be seen.

Chart 3. Generic 5Y covered bond ASW spreads vs 6M (bp)



Note: Data break in June 2016. Past performance is not a reliable indicator of current or future results
Source: iBoxx, Danske Bank

Good liquidity in short-dated, non-callable covered bonds

The liquidity of short-dated non-callable covered bonds is relatively high and at times better than the liquidity of Danish government bonds. Despite periods of very low liquidity (for example, during the financial turmoil in 2008-09), Danish mortgage banks have been able to issue and sell bonds in the market. This has also been noted from time to time in academic literature as well as by Danmarks Nationalbank and is partly attributed to the match funding principle (see next section)[4]. Specifically, recent research finds that the match funding principle and the lack of other funding sources than covered bonds for specialist mortgage banks (for an example the inability to take deposits) means that adverse selection, which tends to be a problem in most other funding markets in periods of severe financial stress, is a very limited issue. Adverse selection arises in a situation where, in a period of rising funding costs, only issuers of a low quality choose to issue and 'good names' tend to stay away from the market, which is not possible under a match funding principle, where bonds are issued on an ongoing basis as loans are originated. For example, German 'Pfandbriefe' issuers were largely absent from the EUR covered bond market during H1 20 when funding costs rose during the COVID-19 crisis, which was not the case at all for the Danish mortgage banks.

[4] See 'Financial Stability 1st Half 2020' – Danmarks Nationalbank (2020) and 'Highly liquid mortgage bonds using the match funding principle' – Dick-Nielsen and Gyntelberg (2020).

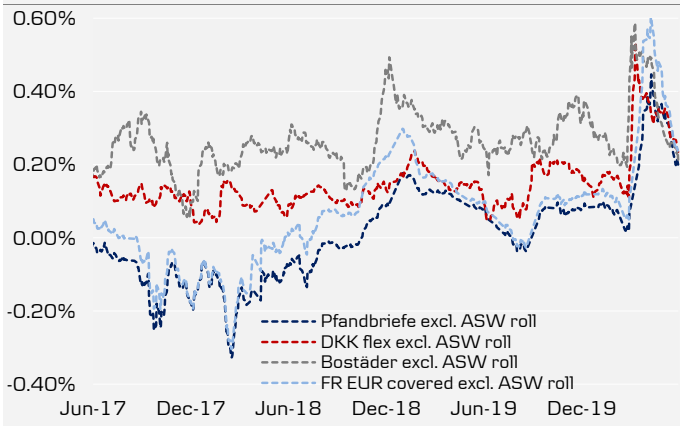
The matched maturities of assets and liabilities create a high degree of transparency, thus circumventing the problem of adverse selection, which is an especially important feature in times of stress. The high liquidity lowers the funding costs of mortgage banks and thereby contributes to lending growth supporting the real economy. The research also shows that liquidity is independent of trade size, issuance size and ownership concentration, but instead attributable to low price uncertainty given the ease by which an issue can be benchmarked to other frequently traded covered bonds.

Danish covered bonds offer same return as EUR covered bonds despite better liquidity

Looking at the current (as of 15 June 2020) spread levels for Danish and other European covered bonds, Danish covered bonds currently trade slightly through the spread levels on European covered bonds if we look at the spreads versus local swap (DKK, SEK and EUR swaps, respectively), which has been the case for a few years now. However, this does not imply that Danish covered bonds offer lower rates of return in a funded and hedged strategy versus peers, nor in an outright long position as shown in charts 4 and 5. Given the fixed exchange rate peg to the euro, DKK covered bonds are substitutes to EUR covered bonds (except for eligibility in ECB's collateral framework) meaning that yield levels typically track those prevailing in the euro area.

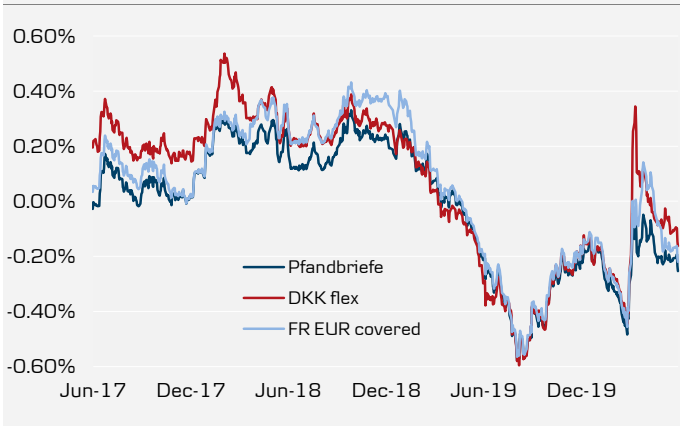
The low ASW level to some extent reflects the Danish FRA/OIS spread, which is typically in the range of 20-25bp relative to average EUR and SEK FRA/OIS spread levels in the period 2017-2020 of 6bp and 13bp respectively. A sometimes important driver for differences in yield levels is the very large callable bond segment (see later), which drives duration needs when interest rates either increase or fall rapidly, as was for an example the case in February 2018 (spreads increased) and June 2019 (swap rates fell rapidly), meaning that 5Y DKK bonds will be in low or high demand.

Chart 4. 12M expected carry excluding ASW-roll is on par with peers in the 5Y segment.



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

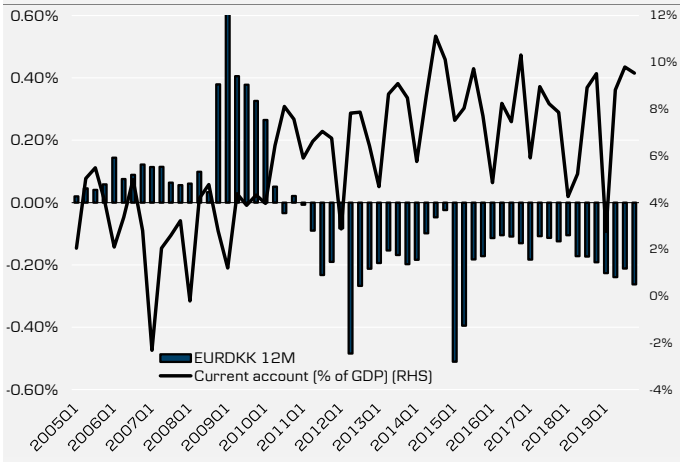
Chart 5. Outright yield levels in 5Y bonds almost equal in DKK and EUR.



Note: The yield levels for EUR covered bonds are not representative of actual clearing levels in March and April of 2020. Past performance is not a reliable indicator of current or future results
Source: Danske Bank

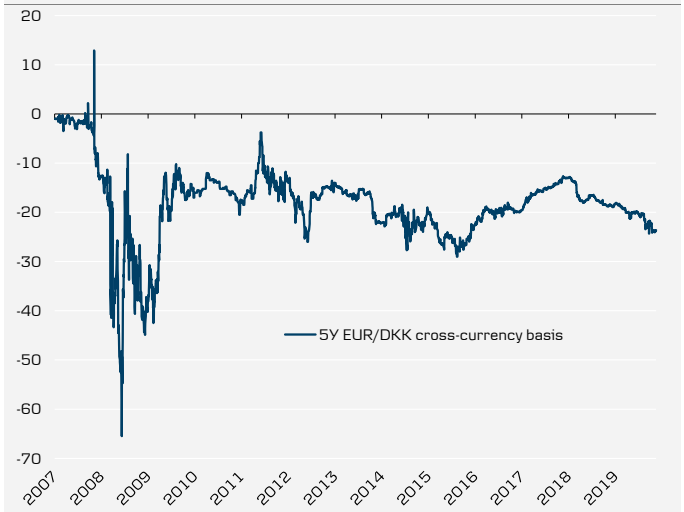
Another (although at present less important driver) is the near permanent EUR/DKK FX forward discount priced in 3M to 12M maturities ever since 2010. The reason is in our view Danish fundamentals, which include several years of high current account surpluses (savings) resulting in a net foreign asset position at 80% of nominal GDP (Denmark's nominal GDP was DKK2,300bn in 2019). The assets are largely concentrated in the Danish life and pension sector managing net foreign assets corresponding to 65% of GDP and a large share of those assets are hedged back into DKK, creating imbalances in the FX forward market, where the need to sell foreign currency is much larger than the need for selling DKK. We see little changing these fundamental flows going forwards and thus the FX forward market will continue to be a positive factor for Danish covered bonds (see charts 6 and 7) below.

Chart 6. Excess carry following from the FX forward discount.



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Chart 7. Negative basis swap also in longer tenors.



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

2. The mortgage credit system

Danish mortgage banks provide mortgage lending at a very competitive cost. This has led to persistent demand for mortgage lending from property owners (residential, commercial and public sector real estate) in Denmark and makes the Danish covered bond market the largest in the world compared with GDP and the largest in Europe in absolute terms.

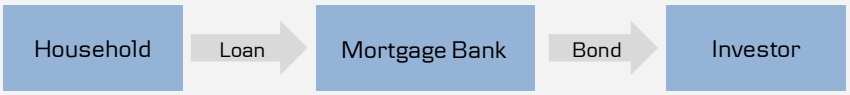
Capital centre

Covered bonds are issued in series. A 'capital centre' consists of a series or a group of series with a joint series reserve fund and joint liability. The assets in each capital centre (also known as the cover pool) are made up of mortgage loans and other eligible assets. A mortgage bank can have multiple capital centres and we refer to the parts of a mortgage bank outside individual capital centres as the 'general capital centre'.

Until 1 July 2007, the Danish mortgage market was characterised by two main features.

- Only specialist mortgage banks were allowed to issue 'Realkreditobligationer' (mortgage covered bonds secured on real property, ROs) and a ship finance institute issued 'Skibskreditobligationer' (covered bonds secured on ships, SMBs).
- All mortgage banks followed a strict balance principle, matching a loan exactly with the bond bought by the investor. In a pure pass-through system, as shown in Chart 8, the mortgage bank did not take interest rate, volatility, FX or liquidity risks but only credit risk.

Chart 8. Pass-through system



Source: Danske Bank

On 1 July 2007, an amendment to the legal framework came into force. The purpose of the amendment was twofold:

- To render the Danish covered bond system compliant with the covered bond criteria in the EU Capital Requirement Directive (CRD). The most important change was that loans entering into the cover pools underlying a CRD-compliant covered bond issuance as of this date should no longer agree only with the relevant LTV limit at disbursement of the loan but at every future point. In the event a loan breaches the limit, supplementary collateral will have to be posted into the capital centre. If no supplementary collateral is posted, the bonds issued out of the capital centre in question will lose their status as 'covered'.
- To give Danish universal banks access to covered bond funding of eligible assets.

To meet its purpose, the amendment introduced different bond types, three of which could be called covered bonds as they fulfilled UCITS and CRD.

- SDO – særligt dækkede obligationer ('covered').
- SDRO – særligt dækkede realkreditobligationer ('covered').
- 'Realkreditobligationer' issued before 31 December 2007 (grandfathered SMBs, 'covered').
- 'Skibskreditobligationer' issued before 31 December 2007 (grandfathered ROs, 'covered').
- 'Realkreditobligationer' issued after 31 December 2007 (new ROs, not 'covered').
- 'Skibskreditobligationer' issued after 31 December 2007 (new SMBs, not 'covered').

SDOs, SDROs and ROs/SMBs issued before 31 December 2007 are all classified as covered bonds and are CRD compliant and thus carry low risk weights. It is not required that the loans collateralising new ROs/SMBs comply with the relevant LTV limits at all times and thus these bonds are not CRD complaint and carry larger risk weights. SDOs/SDROs, ROs and SMBs must be issued out of separate capital centres. The most important difference today between the SDOs and SDROs is that SDROs may be issued by specialist mortgage banks only, while SDOs may be issued by both universal banks and specialist mortgage banks. However, in 2007 when the legislation was passed, joint funding schemes (where funding and subsequent issuance of covered bonds takes place in a credit institution different from the one originating the loan) was for various reasons seen to fit best with the SDO format. This is the reason for Nykredit (who at the time was involved in a joint funding scheme with Totalkredit) choosing the SDO format, whereas Jyske Realkredit and DLR Kredit both wanted to have the opportunity at a later stage to set up joint funding schemes, and thereby also chose the SDO format.

The only ship finance institute is Danmarks Skibskredit issuing SMBs or SDOs secured on ships.

As mentioned above, the amendments allowed the mortgage banks to issue new ROs, but these are not CRD compliant and higher risk weights apply for these bonds relative to SDOs/SDROs. This does not mean that they are still not issued, however, and Nykredit in particular is still active in this segment. In 2009, Nykredit introduced a requirement of 'two-tier mortgaging', as a way to limit the probability of having to fund supplementary collateral in scenarios with large downward price corrections in the housing market. This was implemented for non-residential mortgages in 2009 (the requirement still exists for this segment), whereas for residential mortgages the requirement was not applied until 2012, but was phased out again only two years later. The 'two-tier mortgaging' model implies funding the most risky part of the loans using RO bonds and the less risky part by SDOs[5].

In the years following the new legislation, most mortgage banks refinanced maturing interest-reset loans and floaters into new SDOs/SDROs. Among the other mortgage banks, ROs are no longer used actively in funding plans, although RD and JYSK issues (in very small size) in RO floating rate bonds secured on commercial mortgages.

In the years leading up to the introduction of the new regulation, most larger banks expressed a wish to start up a covered bond programme (Danske Bank is currently the only non-specialised mortgage bank issuing covered bonds). However, the financial crisis hit shortly after and with the introduction of LCR in 2015, the need for large and liquid outstanding bond series cooled the interest more or less completely. Instead, banks have either taken over mortgage banks (the Jyske Bank merger with BRFkredit in 2014) or made joint funding arrangements with specialist mortgage banks. Nykredit is especially active in providing funding for banks included in the Totalkredit partnership, where banks originate the loan on their own balance sheet (so-called 'prioritetslån').

Furthermore, the amendments gave the specialist mortgage banks as well as the universal banks the possibility to issue under two different balance principles:

- The specific balance principle, which is very close to the old balance principle.
- The general balance principle, which is more in line with what we see in Euroland and allows for a wider looser ties between funding and lending and a wider use of derivatives is allowed.

[5] Specifically consider the funding of a loan secured on a residential mortgage. The maximum LTV is 80% for this type of lending, which is funded by SDOs from 0-60% and by ROs from 60-80%.

In Table 3 below we illustrate how issuers in the Danish market have positioned themselves with regard to the type of covered bond and the type of balance principle. A more thorough description of the two balance principles is found in the section titled 'Balance principle'.

The two specialised mortgage banks, Nordea Kredit and Realkredit Danmark, which are owned by the two large banks Nordea and Danske Bank, respectively, are the only ones that issue covered bonds in the SDRO format *and* adhere to the specific balance principle. The specialist agricultural mortgage bank DLR Kredit also adheres to the specific balance principle, but issues in the SDO format. Jyske Realkredit and Nykredit Realkredit have opted for the general balance principle and issue SDOs.

Table 3. Danish issuer positions

Issuer	Type	Balance principle	Main issuing principle
Jyske Realkredit	SDO	General principle	Pass through, tap or auction and euro style, syndication
Danske Bank	SDO	General principle	Euro style, syndication
DLR Kredit	SDO	Specific principle	Pass through, tap or auction
Nordea Kredit	SDRO	Specific principle	Pass through, tap or auction
Nykredit Realkredit	SDO	General principle	Pass through, tap or auction and Euro style, syndication
Realkredit Danmark	SDRO	Specific principle	Pass through, tap or auction
Danmarks Skibskredit	SMB/SDO	Specific principle	Tap and euro style, syndication

Source: Danske Bank

Despite the choice of the largest mortgage lender Nykredit to issue under the general balance principle, Nykredit makes use of match funding on all its mortgage loans and, currently, there is nothing preventing Nykredit from choosing the specific principle[6]. Nykredit made its first EUR syndication in 2017 (3M EURIBOR floater) and did another one in 2018. Both are used for match funding, thus funding floating rate bullet loans in EUR.

Jyske Realkredit uses the flexibility under the general balance principle to finance DKK mortgage loans by issuing syndicated non-callable EUR benchmark covered bonds, and then using derivatives to hedge market risks. Jyske Realkredit has done so since 2016, and was first among the specialist mortgage banks to embark on this practice. Currently the amount outstanding in these bonds is fairly muted and stands at EUR3bn (out of a total outstanding amount of EUR46bn in covered bonds on Jyske Realkredit's balance sheet). Jyske Realkredit also issues non-capped 3M CIBOR floaters for the funding of capped 3M CIBOR floating rate loans through Jyske Bank.

Despite the choices of specific versus general balance principles, mortgage loans granted from specialist mortgage banks are primarily match funded, meaning a 1:1 correspondence between lending terms and issued covered bonds[7]. In addition, the specialist mortgage banks still rely on daily tap issuance as well as two to four refinancing auctions per year.

Not being a specialised mortgage bank, Danske Bank is allowed to issue only covered bonds in the form of SDOs and, being a universal bank, the general balance principle within the ALM suits it best.

[6] Nykredit has made use of the general principle previously when funding loans in NOK by issuance in DKK or EUR. This model would likely also be used to fund potential future lending in GBP (Nykredit has a licence to lend in the UK).
[7] The Danish FSA found in 2018 that the highest portfolio share among mortgage banks in which derivatives were necessary to comply with the balance principle was 10%.

Legislation

Danish mortgage banking is supported by restrictive and detailed regulations designed to protect covered bond investors. Mortgage banking in Denmark is regulated subject to the general Financial Business Act, the specific Mortgage-Credit Loans and Mortgage-Credit Bonds Act and a number of Ministerial Orders.

Key elements of the regulation are as follows.

- Specialist mortgage banks must operate subject to the balance principle limiting the market risk exposure of the issuer to a minimum.
- Bonds issued and collateral must be assigned to specific capital centres within the specialist mortgage banks.
- Each capital centre is regulated subject to a balance principle – either the general or the specific principle – at the discretion of the issuer.
- Mortgage loans and securities serving as collateral must meet restrictive eligibility criteria, including loan-to-value (LTV) limits and valuation of property requirements.
- Investors have a privileged position in the case of bankruptcy, rendering covered bond bankruptcy remote.
- Mortgage banks are closely supervised by the Danish FSA.

Property registration and the compulsory sale system

A key feature of the Danish system is very well defined property rights through a general register of all properties in Denmark. This consists of the Danish title number and land registration systems and efficient compulsory sale procedures. The title and land registration systems ensure that ownership and encumbrances on individual properties are easily identified and that the information is available to the public. Furthermore, if a borrower defaults on a payment, the mortgage bank can take over the house and the compulsory sale procedure ensures that a mortgage bank can sell the house in the real estate market or through a forced sale. The period from default to a forced sale being completed may be as short as six months. Hence, the Danish title number and land registration systems add investor protection.

Balance principle

The balance principle is a guiding principle of Danish mortgage banking, which restrictively regulates the market risk exposure of Danish covered bond issuers.

Table 4. Balance principles

	General principle	Specific principle
Payments definition	Payment may include margins	Payments excluding margins
Interest risk	Risk limit 1%[1] +2%[2] of OC: +/-100bp parallel shift Risk limit 5%[1]+10%[2] of OC: +/-100bp twist and +/-250bp shift 50% offset of EUR interest rate risk	Risk limit 1% of OC: +/-100bp parallel shift and twist No offset of EUR interest rate risk
Exchange rate risk	Risk limit 10% of OC: +/-10% shift in EU currencies +/-50% shift in other currencies	Risk limit 0.1% of OC Currency indicator II
Option risk	Risk limit 0.5%[1]+1%[2] of OC: +/-100bp shift in volatility (vega)	Perfect hedge required
Liquidity risk	Deficits in interest payments may not exceed OC within 12M NPV surplus of all future payments	Deficits in total payments limited to: - 25% of OC in year 1-3 - 50% of OC in year 4-10 - 100% of OC from year 11

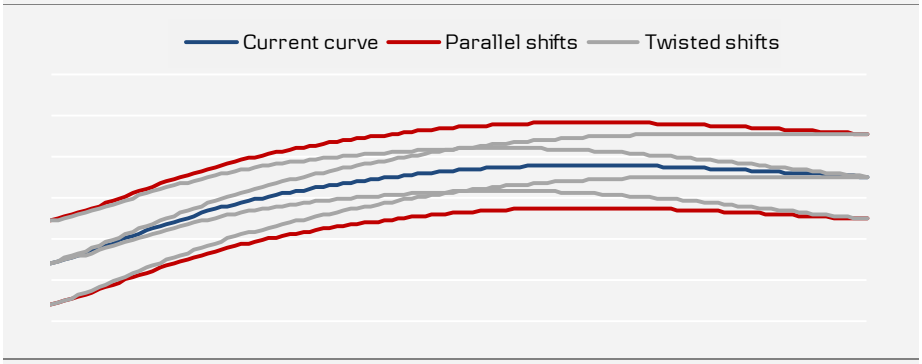
1. Percentage of the capital adequacy requirement
2. Percentage of the additional excess cover for mortgage banks
Note: OC = over-collateralisation
Source: The Danish FSA, Danske Bank

The principle imposes a number of tests, which must be passed at all times and the mortgage bank must choose to adhere to one of two balance principles: the general balance principle or the specific balance principle.

The balance principle is enforced by the Danish FSA. If a mortgage bank does not pass the tests, the FSA must be informed immediately. In addition, mortgage banks must report their market risk exposure to the FSA on a quarterly basis.

Interest rate risk is tested in scenarios of both yield curve shifts and yield curve twists. The diversity of scenarios implies that duration matching of a loan and funding portfolio will not be sufficient to pass the test.

Chart 9. Shifting the yield curve



Source: Danske Bank

Currency risk

Currency risk is tested in scenarios of shifts in the currencies in which the bonds have been issued to comply with the general principle.

Currency risk is tested employing an empirical measure of the greatest loss suffered within a 10-day period with a 0.99 probability (Currency Indicator II) to comply with the specific principle. The measure is calculated by the Danish FSA.

Option risk

Option risk is tested in scenarios of shifts in the volatility (vega) to comply with the general principle.

Liquidity risk

The cover of future payments to covered bond investors is tested to limit the liquidity and funding risk of mortgage banks. In passing this test, mortgage banks will have sufficient liquidity to meet future payments on mortgages.

Specialist bank principle

Before the SDO legislation in 2007, only specialist mortgage banks were allowed to issue covered bonds. However, with the introduction other credit institutions can today issue covered bonds, but only Danske Bank is currently making use of this opportunity and it is not expected that this will change for the foreseeable future, given the added regulatory requirements in past years. On top of this the Danish FSA, borrowers and market participants in general have a preference for the transparency that the specialist mortgage bank model provides for. Thus, the landscape for mortgage loans is very much dominated by specialist mortgage banks still[8].

The specialist bank principle confines the activities of mortgage banks to mortgage lending based on the issuance of covered bonds.

The principle implies that mortgage banks are prohibited from granting loans that do not meet the eligibility criteria imposed by legislation. Similarly, the sources of funding are confined to issuing covered bonds, i.e. collecting deposits is not an applicable source of funding for Danish mortgage banks. This also means that new lending is always matched by a tap of covered bonds[9].

The principle implies that mortgage banks operate as monoline businesses, which adds to the transparency of investing in covered bonds.

Asset eligibility criteria

There are slight differences between assets can be used as collateral for the issuance of covered bonds depending on whether the bond in question is an SDO/SDRO or an RO. For SDOs/SDROs and ROs, the following assets qualify as collateral.

- Loans secured by a registered mortgage on real property, including loans secured by temporary collateral.
- Loans secured by a registered mortgage on real property, including loans secured by temporary collateral, provided by other credit institutions in accordance with the statutory provisions on joint funding.
- Bonds and debt instruments issued by or guaranteed by public sector entities and central banks.

In addition, for SDOs/SDROs the following types of assets qualify as well.

- Public loans.
- Mortgages originated by other credit institutes in line with the rules on joint funding schemes.

[8] Danske Bank's domestic cover pool (D) comprises DKK28bn of pool notional as compared to c. DKK3,100bn total issued covered bonds.
[9] Note that supplementary collateral or OC can in theory be in the form of mortgage loans, but that would require the need of a tap in subordinated and thus more expensive debt instruments.

- Bonds, instruments of debt and other claims and guarantees issued by credit institutions qualifying for credit quality step 1, at a maximum value corresponding to a nominal 15% of the bonds issued out of the capital centre (10% if credit quality step 2). Included in this limit are financial instruments, which have been entered into for the purpose of hedging risks between the assets in the capital centre and the covered bonds and where the agreement specifies that the suspension of payments or bankruptcy of the issuing bank does not constitute a breach. Any exceeding of these limits must be immediately remedied by provision of supplementary collateral in assets as set out in the CRR Article 129(1)a-b not encompassed by the 15%/10% limit.

Ships are not eligible for SDOs/SDROs under the specific Mortgage-Credit Loans and Mortgage-Credit Bonds Act. Thus, specialist mortgage banks cannot conduct mortgage lending secured on ships. Ships are funded by Danish Ship Finance under the Act on a ship finance institute.

Eligibility criteria for RO are as follows.

- Terms may not exceed 35 years for mortgage loans guaranteed by municipalities and 30 years for all other mortgage loans.
- Private residential and leisure home mortgages may not be repaid more slowly than a 30-year annuity with an option for interest-only periods of a maximum of 10 years.

The eligibility criterion for all bond types is as follows.

- Market value of pledged property must be assessed by the mortgage bank.

Table 5. Eligibility criteria for mortgage loans

	RO	SDO/SDRO
Collateral assets	Real property, public loans	Real property, public loans, derivatives and substitutions assets
LTV calculations	At time of granting the loan	Frequency to comply with FSA recommendations

Source: The Danish FSA, Danske Bank

Table 6. Eligibility criteria for mortgage loans – maximum LTV

Property type	RO	SDO/SDRO
Private residential property	80%	80% (75%*)
Residential rental property	80%	80% (75%*)
Office and shop property	60%	60% (70%**)
Industrial property	60%	60% (70%**)
Agricultural property	70%	60% (70%**)
Loans covered by municipal guarantee	80-100%	80%
Holiday homes	75%	75%
Land	40%	40%

** The maximum LTV is 75%, if the loan has a 30Y interest-only period*
*** The maximum LTV can be raised to 70%, if supplementary collateral is provided of no less than 10% for the part of the loan that exceeds 60% of the value of the property*
Source: The Danish FSA, Danske Bank

In general, the pledged property must be valued subject to an inspection of the property by a valuation officer of the mortgage bank. However, the majority of the Danish mortgage banks, including Realkredit Danmark, Nykredit Realkredit, Jyske Realkredit and Nordea Kredit, have developed a valuation model based on extensive data on property prices in Denmark. The Danish FSA has reviewed the reliability of the models. Based on this, the FSA can in some cases grant an exemption from the inspection requirement for properties meeting certain criteria.

Mortgage banks must provide supplementary collateral to bond investors if the value of mortgaged properties decreases and LTV ratios at single loan levels exceed the stipulated LTV limits. This requirement applies at each point in time to SDOs/SDROs but not to ROs. This meant the introduction of a new debt class in 2008 branded under the name 'Junior Covered Bonds' (JCBs) or section 15 senior debt – the bonds can be used to fund supplementary collateral as well as over-collateralisation (OC) of the cover pool for rating purposes.

Currently (June 2020) the outstanding amount of JCBs is DKK3bn, all issued by DLR under the name 'Senior Secured Bonds'. The reason for the low amount is mainly the increase in house prices lowering LTVs as well as providing for a sufficient OC. In turn, going forward, it is expected that part of the potential need to fund supplementary collateral will happen through the use of senior unsecured debt debt (see more below for an introduction to MREL in Danish legislation and see chapter 5 for more on JCBs).

Bankruptcy regulation

Covered bond investors are awarded a privileged position in a bankruptcy scenario. The privileged position ensures that covered bond investors will only be affected in a bankruptcy scenario in exceptional cases, rendering the chances of covered bond bankruptcy remote.

The bankruptcy regulation specifies detailed guidelines, which must be observed in a bankruptcy scenario. In the event a mortgage bank becomes insolvent, the Danish FSA may file a petition for bankruptcy. After a bankruptcy order has been issued, individual capital centres and the general capital centre are treated separately and funds cannot be transferred between capital centres.

All the funds in individual capital centres and the general capital centre are used to cover payments arising from senior covered bondholders' preferential claims and certain financial instruments. Financial instruments can be an asset or a liability to the capital centre only if the instrument is used to hedge market risk between cover pool assets and issued covered bonds *and* if the agreement on the financial instrument specifies that a suspension of payments, bankruptcy or inability to comply with the request for supplementary capital of the mortgage bank does not constitute breach. Counterparties to these financial instruments thus rank pari passu with senior covered bondholders in a bankruptcy scenario. After payments to senior covered bondholders and qualified derivatives counterparties have been covered in full, section 15 senior debt holders' claims are covered and any remaining funds will be transferred to the bankruptcy estate. The above proceedings take place even if the issued bonds have lost their status as 'covered' due to a breach of the over-collateralisation requirement.

Bankruptcy cannot be used by bondholders (senior or junior) or derivatives counterparties as a valid reason to demand an acceleration of payments and at the same time mortgage debtors' rights to redeem in part or in full any loan obligation are still applicable. Thus, coupons and repayments are transferred to bondholders in ordinary fashion to the extent possible. If there is a lack of sufficient liquid funds, coupons will be paid before any promised repayments.

Bonds that are up for refinancing may be replaced by new issuance of refinancing bonds. However, the liquidator is not allowed to do so if after the issuance of refinancing bonds there is an insufficient amount of funds in place to cover the payments to bondholders or if it cannot be expected that there is a sufficient amount of buyers. In this case, the maturity of the expiring bonds will be extended by 12 months at a time.

Implementation of MREL (BRRD) into Danish law

Debt buffer requirement

When the Bank Recovery and Resolution Directive (BRRD) was implemented into Danish law, the Danish legislators exercised the option to exempt mortgage banks from bail-in[10] (covered bonds are already exempt from the bail-in requirement in BRRD). This in turn also means that mortgage banks are exempt from the minimum requirements for own funds and eligible liabilities (MREL). Instead, legislators have introduced a debt buffer requirement corresponding to 2% of us mortgage bank's unweighted lending exposures. The requirement can be met by CET1, AT1, Tier 2 instruments or unsecured senior debt with a maturity longer than two years[11]. Furthermore, there is a requirement for a diversified maturity structure and the Danish FSA may decide that the instruments used to meet the debt buffer requirement include in the terms a contractual loss absorption feature whereby in a resolution event such debt instruments can be written down without the use of bail-in. Instruments used to meet the debt buffer requirement cannot be issued out of specific capital centres but must be issued by the general capital centre and cannot at the same time be used to fulfil Pillar I, Pillar II or combined buffer requirements. However, these instruments can (as mentioned above) be used to fund supplementary collateral and OC in individual capital centres. If this is the case the funds obtained must be placed in eligible assets (see section below on 'Placement of funds and liquidity requirements').

Size of debt buffer requirement

The size of the total MREL/debt buffer requirement depends on whether the mortgage bank in question has been appointed as a Systemically Important Financial Institution (SIFI) on a standalone basis or at a consolidated level as part of a group. If the mortgage bank has been appointed as SIFI on a standalone basis, the debt buffer requirement must be set at a level, although at a minimum of 2%, that ensures that the mortgage bank's total solvency requirement and debt buffer requirement in combination totals no less than 8% of total liabilities and own funds (TLOF). The 8% requirement ensures that the Danish resolution fund can be employed to cover losses or restructuring. This requirement must be complied by 1 January 2022 (currently only DLR is a standalone SIFI not part of a domestic or foreign group). If the mortgage bank as the part of a group has been appointed a SIFI at a consolidated level, the size of the debt buffer requirement must be set at a level, although at a minimum of 2%, that ensures that the mortgage bank's total solvency requirement (as the mortgage bank's solvency requirement does not enter the MREL requirement of the group), the group's MREL requirement and debt buffer requirement in combination total no less than 8% of the group's TLOF. In case the combination does not total 8%, it is the debt buffer requirement of the mortgage bank in the group that will be increased until the combination totals 8%.

As mentioned above, the Danish FSA *may* require the senior unsecured debt issued to meet the debt buffer requirement to include a contractual loss absorption feature. It is not required that the debt issuance is subordinated relative to simple claims but the FSA guides mortgage banks to follow such practice and due to S&P's Additional Loss-Absorbing Capacity requirement for banks, it can be worth issuing in SNP format even if this is not an actual requirement.

[10] Entities subject to bail-in means that the supervisory authority can, if the use of such will result in reasonable restructuring of said entity, convert subordinated liabilities into equity. The resolution strategy chosen for all SIFIs in Denmark is restructuring, whereas for other banks it is liquidation under normal insolvency procedures.

[11] The Danish FSA requires the entire MREL requirement for banks under BRRD I to be subordinated. Until 1 January 2022, banks can fulfil the subordination requirement using ordinary senior debt issued before 1 January 2018.

If the mortgage bank is a wholly owned subsidiary as part of a group and if the resolution strategy chosen is to restructure an insolvent group without separating the parent and the mortgage bank (the case of Jyske Realkredit, Realkredit Danmark and Nykredit Realkredit), the Danish FSA guides that instruments used to meet the debt buffer requirement are subordinated and have a contractual loss absorption feature. Furthermore, the parent must buy issued debt instruments used to meet the debt buffer requirement.

As of Q4 19, only DLR had issued publicly traded senior non-preferred debt (SNP) on a standalone basis (DKK4bn). However, Nykredit Realkredit issues on behalf of the entire Nykredit group (possible cf. section 267(3) in the Financial Business Act). RD mentioned in its annual report of 2019 that if over-collateralisation (OC) requirements were tightened, it would handle this by raising bail-in-able debt. Jyske Realkredit issued in 2019 DKK750m SNP, which was subsequently bought by the parent Jyske Bank[12].

Example: Debt buffer requirement of Jyske Realkredit in 2019. Jyske Realkredit is part of the Jyske Bank Group. In 2019 the Risk Exposure Amount (REA) of the group was DKK181.3bn of which REA in the mortgage bank was DKK 81.3bn – thus REA excluding the mortgage bank was DKK100bn. The MREL requirement was 30.7% or DKK30.7bn[13]. The total solvency requirement for the mortgage bank was DKK12.2bn. Total liabilities and own funds (TLOF) were DKK649bn. Thus, the sum of the MREL requirement of the group and solvency of the requirement makes up more than 8% of TLOF and thereby the debt buffer requirement is fixed at 2% of the total unweighted lending exposures.

Capital requirements

Mandatory over-collateralisation

Mortgage banks must observe capital requirements as defined in applicable EU directives, i.e. the capital base of mortgage banks must be a minimum of 8% of REA. In addition, the common equity Tier 1 capital (CET1) and the Tier 1 (T1) must be at least 4.5% and 6.0%, respectively, of the risk exposure amount. This requirement applies to both the general capital centre as well as for individual capital centres. If a capital centre is unable to meet this requirement, funds must be transferred from the general capital centre unless such a transfer would imply a breach of the requirement in the general capital centre. Funds deployed for the purpose of mandatory over-collateralisation must be held separately from other liquid funds that the issuer might hold. Funds in excess of the capital requirement in individual capital centres may be transferred to the general capital centre.

The mandatory over-collateralisation of mortgage banks falls within the scope of the privileged position of covered bond investors in a bankruptcy scenario. The trustee will be instructed to employ the mandatory over-collateralisation exclusively to meet the payment obligations on covered bonds issued. The mandatory over-collateralisation may not be employed for any other purpose.

Capital buffer **requirements**

In addition to the Pillar I requirement applying also for individual capital centres the general capital centre must also comply with an individual Pillar II requirement set by the Danish FSA and with the following three capital buffer requirements.

[12] Jyske Realkredit mentions in its base prospectus that the buyer of all senior unsecured debt used to fulfil the debt buffer requirement will be the parent Jyske Bank. This is not a coincidence as the Danish FSA guides that all mortgage banks, which are a part of a group and where the resolution strategy is not to separate the mortgage bank from the parent, should sell such debt to its parent.

[13] The MREL requirement for Danish SIFIs is set at twice the solvency need plus twice the combined buffer requirement (however, the countercyclical capital buffer enters only once from 2019) and the Danish FSA demands that only subordinated liabilities qualify for MREL. Following the implementation of BRRD II, however, which takes effect end-2020, a maximum subordination requirement corresponding to max{(twice the solvency need) + the combined buffer requirements; 8% of TLOF} is implemented. The remaining part can be fulfilled by ordinary senior debt.

- **Capital conservation capital buffer** equal to 2.5% of the risk exposure amount.
- **Discretionary counter-cyclical capital buffer** of up to 2.5%. The discretionary counter-cyclical capital buffer is currently 0% in Denmark, after being lowered in the face of the COVID-19 crisis, but was planned to reach 2% in October 2020. It is expected that the Danish Systemic Risk Council will start to increase the buffer again, but at the earliest in 2021 with effect from 2022.
- **Systemic risk buffer** applies only to SIFIs (systemically important financial institution) and is set according to the degree of systemic importance for the different financial institutions. The systemic risk buffer currently applies to all mortgage banks as these are all deemed to be SIFIs or part of a SIFI group.

Table 7. Systemic risk buffers and Pillar II requirements (% of REA – Q4 19)

Institution	Systemic risk buffer	Pillar II requirements	Total requirement
Realkredit Danmark	3.0%	2.4%	16.9%
Nykredit Realkredit	2.0%	2.9%	16.4%
Jyske Realkredit	1.5%	2.1%	15.1%
Nordea Kredit	1.5%	3.0%	16.0%
DLR Kredit	1.0%	1.2%	13.7%
Danmarks Skibskredit	0.0%	1.2%	12.5%

Note: At Q4 19 the counter-cyclical capital buffer was still 1%. The total requirement is the Pillar I and the Pillar II requirements plus combined buffer requirements.
Source: Mortgage Banks

Note that with the introduction of the new covered bond directive (see below), a minimum OC requirement at 5% has been introduced (non-risk weighted). However, if the jurisdiction (as is the case in Denmark) has introduced a risk based requirement, the requirement can be lowered to 2%.

Placement of funds and liquidity requirements

Placement of funds

Supplementary collateral must be placed in accordance with the CRR Article 129(1)a-f or Article 129(3). Mortgage banks are, however, allowed to place 'balancing funds' in connection to covered bond issuance (i.e. prepaid funds from repayments, fixed-price agreements, etc.) temporarily in reverse repos and deposits with other credit institutions above the 15% limit mentioned in the section 'Asset eligibility criteria'. Also not included in this limit are the placement of such funds, within the capital centre, in own issued bonds.

LCR

Danish mortgage banks are partly exempt from the LCR calculation, given the tight connection between funds flowing in and out of capital centres and high degree of match funding. Specifically, an inflow cap equal to 75% of outflows exists in the LCR regulation and exempted from this cap are, for example, a borrower's interest rate payments and principal repayments. Instead, the Danish FSA has set a Pillar II HQLA requirement corresponding to the higher of 2.5% of a mortgage bank's unweighted mortgage lending ('the LCR floor') or net cash outflow over the coming 30 days including inflow cap exemptions. Assets used to fulfil the requirement of supplementary collateral in individual capital centres as well as any funds arising in connection to balancing funds are to be considered encumbered for the calculation of LCR.

In 2019, the Danish FSA reported that it will phase out the LCR floor replacing it with another risk based and individual Pillar II liquidity add-on. The new add-on will replace the existing LCR floor when the new covered bond directive takes effect (see below). Until then the mortgage banks will enter an observation period in which the new model will become a reporting requirement. The model takes into account potential new loans-in-arrears, refinancing and 'open prepayments' for the upcoming payment date[14].

Block issues

It is allowed for mortgage banks to conduct so-called 'block issues' of bonds of an amount corresponding to the expected gross lending over the coming six months (general balance principle) or 90 days (specific balance principle). Bonds not secured by mortgage loans within six months/90 days after the block issue must be cancelled. Block issues have been introduced in order to better reflect the actual outstanding amount in a bond series[15].

New legislation addressing refinancing risk

On 1 April 2014, a new law aimed at reducing refinancing risk for borrowers and mortgage banks came into force. Initially it covered loans where the refinancing period of the underlying bonds is up to 12 months (FlexLån® F1 loan). For loans where the refinancing period of the underlying bonds is more than 12 months, the law came into force from 1 January 2015. The law applies to non-callable bullets, short- and medium-term capped floaters and floaters.

The new law transfers the refinancing risk from the borrowers/mortgage banks to the investor. The law is centred on the two following main triggers.

Interest rate trigger

- **Interest rate trigger.** If the yield at a refinancing auction increases by more than 500bp within a period of one year and the underlying bonds have a maturity of up to two years after refinancing, the maturity will be extended by one year. The yield of the extended bond will be the yield level on a corresponding bond traded 11-14 months earlier plus 500bp. A maturity extension triggered by a rise in the yield level of 500bp is limited to one year. For floating-rate bonds, the interest rate at the refinancing of a mortgage loan cannot be fixed at a rate more than 500bp above the most recently fixed interest rate. The interest rate must remain unchanged for 12 months or up to the next refinancing unless a lower interest rate is fixed within the said 12 months or before the next refinancing. The 'Interest-rate trigger' element only applies to loans where the refinancing period of the underlying bonds is 24 months or less.

Failed auction trigger

- **Failed auction trigger.** If a mortgage bank is unable to sell its bonds at a refinancing auction, the maturity of the underlying bond will be extended by one year. If the mortgage bank is still unable to sell the bonds the following year, the maturity of the bond will be extended by one year every year until the mortgage bank is able to sell the bonds in the market or the loans mature. If a mortgage bank is unable to sell its bonds at a refinancing auction and the maturity is extended by one year, the yield of the maturity-extended bond will be the yield on:
  - A corresponding bond traded 11-14 months earlier plus 500bp if the maturity is less than or equal to 24 months.

[14] When a borrower chooses to prepay a mortgage the mortgage bank registers a cash outflow on the upcoming prepayment date. However, no cash inflow is registered until the borrower decides on what mortgage is refinanced into and conducts a fixed price agreement. This presents a liquidity risk since no cash inflow is matching the outflow until then. The add-on will depend on cash-flows inside the coming 30 days in line with the period used under the existing LCR requirement.
[15] This is particularly the case for joint funding agreement schemes, where the mortgage bank issuing covered bonds in order to fund mortgage lending by other banks will on an ongoing basis do block issues in order to reflect the expected amount of bonds to be sold over the coming period.

  - A corresponding bond with a maturity of 11-14 months traded 11-14 months earlier plus 500bp if the maturity is more than 24 months.

- If the mortgage bank is still unable to sell the bonds in the market after the first maturity extension, the yield will remain unchanged. Applying the yield level on a corresponding bond with a maturity of 11-14 months traded 11-14 months earlier enables the mortgage bank to reuse the bond series up until the time to maturity if the bond falls below 24 months. This is an important feature, as it significantly improves the liquidity for bonds with maturity of more than 24 months.

If a mortgage bank is under resolution and the maturity is extended under the failed auction trigger, the coupon is fixed at a variable reference rate (for example 12M Cita) plus up to 500bp, for one year at a time. However, if the Trustee is still able to issue bonds, there will be no activation of the triggers.

The maturity on capped floaters and floaters can be extended due to the failed auction trigger or interest rate trigger (only for bonds with an original maturity of less than 24 months). If the maturity is extended due to the failed auction trigger, the coupon rate after the extension will be the coupon rate at the last fixing plus 500bp. This new rate is fixed for 12 months.

If the maturity is extended due to the interest rate trigger – where the interest rate increases by more than 500bp relative to the last fixing – the coupon after the extension will be the coupon rate at the last fixing plus 500bp. This new rate is fixed for 12 months, unless the yield falls to a lower level at a new fixing within the 12 months.

The transferring of the refinancing risk to the investors means investors have to price in both the risk of a pronounced rise in yields and the risk of a 'failed' auction.

The interest rate trigger and failed auction trigger as described in the above only apply to covered bonds issued by a mortgage bank. To ensure that retail banks do not have a competitive advantage by being able to issue covered bonds without the interest rate trigger, retail banks' issuance of covered bonds must have a maturity of more than 24 months. Hence, as of 1 January 2015, retail banks e.g. Danske Bank can only issue covered bonds with a minimum maturity of 24 months.

Banks' issuance of covered bonds must have a maturity of more than 24 months

In the event that a retail bank is unable to replace covered bonds at maturity with a new issue of covered bonds, it will be possible for the bank to repay the principal of the matured bonds from other sources of funding, e.g. deposits. Hence, the refinancing risk for banks is primarily relevant in a winding up situation where there is no access to other sources of funding. In this case, there will be a maturity extension of one year at a time.

FSA supervision

The risk profile of mortgage banks is closely monitored by the Danish FSA.

Property valuations are reported directly to the FSA for control purposes. If the value of a pledged property is set too high, the FSA will carry out a second valuation. If the second valuation confirms that the value is set too high, the FSA will instruct the mortgage bank to reduce the size of the loan to observe the maximum LTV ratio.

Property valuations are reported to the FSA

Reports to the FSA are prepared on a quarterly basis on the following.

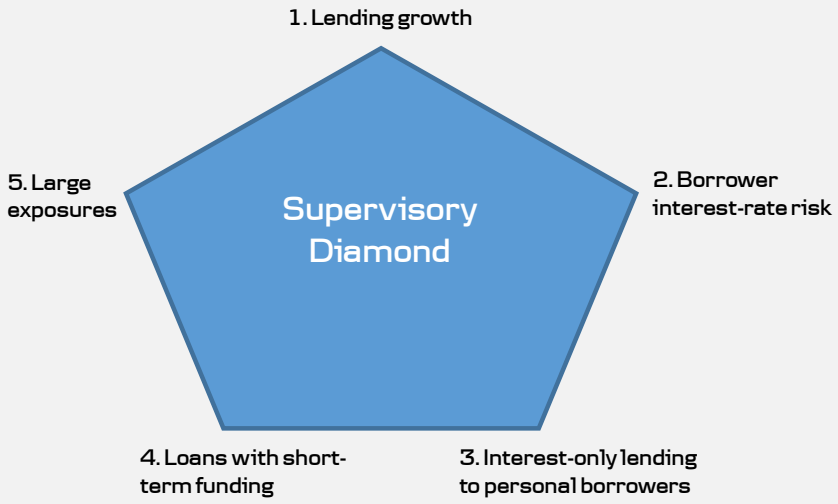
- Credit risk exposures.
- Market risk exposures.
- Solvency.

Inspections of mortgage banks by the FSA are performed on a regular basis. During inspections, the FSA will monitor if risk-mitigating procedures are sufficient and being adhered to.

Supervisory Diamond to be implemented in 2018/2020

The Danish FSA's 'Supervisory Diamond' for mortgage banks will be implemented in 2018/2020. The Diamond contains five indicators with corresponding limits on risk of the mortgage banks. The five indicators are as follows.

Chart 10. Supervisory Diamond for Danish mortgage-credit institutions



Source: Danish FSA and Danske Bank

- **Lending growth.** Growth in lending to individual customer segments should not exceed 15% per year. The four customer segments are private homeowners, rental property, agriculture and other corporates.
- **Borrower interest rate risk.** Share of lending where loan-to-value (LTV) exceeds 75% of the lending limit for mortgage banks and where the interest rate is only fixed for up to two years should be less than 25%. Applies only to loans to private homeowners and rental property. Loans hedged by interest rate swaps and the like are excluded.
- **Interest-only lending to personal borrowers.** The share of interest-only loans in the LTV band above 75% of the lending limit should not exceed 10% of total lending. Interest-only loans are included regardless of position in order of priority.
- **Loans with short-term funding.** The share of lending to be refinanced should be less than 12.5% of the total loan portfolio per quarter and less than 25% of the loan portfolio annually.
- **Large exposures.** Sum of the 20 largest exposures should be less than the institution's CET 1 (core equity tier 1 capital).

The benchmarks for interest-only lending (point 3) and loans with short-term funding (point 4) will apply from 2020, while the other benchmarks have been in effect since 2018.

Our general assessment is that the Supervisory Diamond will prompt the mortgage-credit institutions to maintain their focus on reducing the proportion of interest-only loans and loans with annual refinancing and on spreading out the auctions.

New standards and limitations of the choice of loan products

During the past seven years numerous actions have been taken in order to limit the choice of eligible loan products among the most risky borrowers (those with high LTV and DTI ratios[16]). The reasoning has been that a general consolidation among Danish households is seen as beneficial given the gradual build-up of a large share of interest-reset loans and interest-only features among the outstanding stock of mortgages, as well as fairly large increases in housing price. Also, given the currently low interest rates, the regulation comes at a time when there is little macroeconomic effect on the economy as a whole. Note that mortgage banks have throughout the years implemented many of the requirements set out below in their internal credit policies, but they have not previously been written into law.

Additional criteria for lending

In 2013 a requirement that a borrower must, no matter the choice of loan product, be able to service a fixed rate amortising loan, was written in to law.

In 2014, the supervisory diamond (see above) was introduced.

In 2015, the requirement that debtors should provide for a minimum 5% equity financing was introduced. This requirement effectively means that the amount of second lien (bank) debt can at most make up 95% of the value of the property.

In 2016, the FSA introduced a guidance for 'growth areas' meaning municipalities in the Greater Copenhagen Area and Aarhus municipality. For these areas the mortgage bank's assessment of whether disposable income is sufficient at the time of granting the loan should generally be based on a fixed interest rate that is 1 percentage point higher than the current fixed interest rate, though at least 4%, and with a repayment period of a maximum of 30 years.

In 2017 a guidance issued by the FSA put further limits on the choice of eligible mortgage loans for risky borrowers[17]. The limits apply only to those borrowers with: 1) a DTI of more than 4 and 2) a LTV of more than 60%. In case a borrower either has a LTV below 60% or a DTI below 4 all loans are eligible.

However, if the borrower has either: 1) a DTI above 4 but below 5 and 2) the LTV is above 60% the borrower can only access fixed rate mortgages incl./excl. repayment or 5Y interest-reset loans incl. repayment. The same is the case if the borrower has a LTV below 75% but above 60% not matter the DTI.

The 'growth area' guidance comes into effect if the borrower has a DTI above 5 and a LTV (mortgage and bank debt in combination) above 75%, in which case only fixed rate loans incl. repayment are eligible. The same limited loan offer applies if a borrower in a 'growth area' has a DTI of more than 4 but below 5 and a LTV (mortgage and bank debt in combination) of more than 90%.

Majority of Danish covered bonds qualify as Level 1B assets

The CRR includes the rules for the Liquidity Coverage Ratio (LCR). LCR has a large impact on the pricing of Danish covered bonds due to the large share of the investor segment being regulated under CRR. Level 1B and Level 2A classes are relevant for Danish mortgage bonds and the main features are as follows.

[16] The debt-to-income ratio (DTI) is the debtor's total amount of debt (mortgage and bank debt) relative to income before tax.
[17] An important factor not guided by the FSA is the monthly disposable income after amortisations. This is to be assessed for each borrower individually.

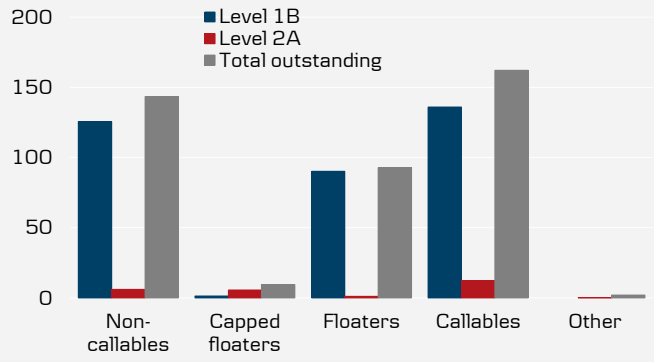
- **Level 1B.** Covered bonds (CRD- or UCITS-compliant mortgage bonds) with a minimum rating of AA- and an outstanding volume of at least EUR500m may account for up to 70% of the liquidity buffer after a haircut. The haircut is 7% (i.e. only 93% of the market value can be included in the liquidity buffer). There is an OC requirement of 2% in the capital centres from which the mortgage bonds are issued.
- **Level 2A.** Covered bonds (CRD- or UCITS-compliant mortgage bonds) with a minimum rating of A- and an outstanding volume of at least EUR250m may account for up to 40% of the liquidity buffer. The haircut is 15%. There is an OC requirement of 7% in the capital centres from which the mortgage bonds are issued. For covered bonds that do not meet the liquidity requirement of EUR500m but meet all other requirements for Level 1B, the OC requirement is 2%.

Grandfathered ROs and new ROs are on a par with SDO/SDRO in the EU Commission's delegated act, as they are all UCITS-compliant. Junior Covered Bonds cannot be included in LCR.

All the mortgage-credit institutions have an AAA rating from S&P for their most used capital centres (see ratings table in Chapter 4), while mortgage bonds issued out of Realkredit Danmark's capital centres S and T have a rating from Fitch. If a capital centre is rated by two or more rating institutions, the second highest rating will be used. All rated Danish covered bonds meet the rating requirement of at least AA+.

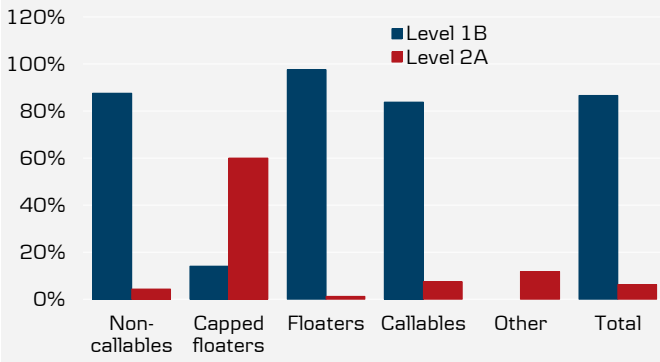
Based on the outstanding volumes for Danish mortgage bonds as of June 2020, we estimate that around 86% of the total outstanding volume of mortgage bonds has an outstanding volume of more than EUR500m, while around 6% has an outstanding volume of between EUR250m and EUR500m (see charts below). As can be seen from the charts, there is a relatively high share of Level 1B assets across all segments.

Chart 11. Total outstanding volumes of LCR eligible Danish covered bonds (EURbn)



Source: Danske Bank

Chart 12. Share of Level 1B and 2A assets



Source: Danske Bank

Only the capped floater segment has a low share of Level 1B, which is due to the very low issuance in the segment (only Nykredit issues in this segment). Mortgage banks have in general lifted the share of Level 1B assets during the past years (up from 80% in 2017), which happens partly automatically as the capped floater segment runs off and grandfathered ROs are now mostly refinanced into new SD(R)Os. Mortgage banks have also been implementing targeted efforts to increase the share of level 1B bonds by, for example, collecting enough loans for refinancing for a particular payment date to make liquid bond series (DLR did that in 2019 by moving some borrowers to the October refinancing), and NYK has refinanced commercial floating rate loans from Capital Centre D into new liquid RO series in Capital Centre G starting in 2017.

New covered bond directive

In March 2018 the European Commission (EC) put forward a proposal for a new directive regarding regulation of covered bonds and when implemented it will be the first directive with the specific aim to regulate covered bonds in a comprehensive manner. There have been national covered bond legislations throughout Europe and the CRR's Article 129 regulates what eligible assets the proceeds from covered bonds issuance can be placed in. Finally, there is the Directive on Undertakings for Collective Investments in Transferable Securities (UCITS) Article 52(4), which defines the minimum requirements that provide the basis for privileged treatment of covered bonds in different areas of European financial market regulation[18]. The covered bond directive (EU 2019/2162) was published as law in the fall of 2019 meaning that the directive will take effect in Danish law in July 2022.

The proposal includes three pillars: the directive itself, a change of the CRR's Article 129 and a set of voluntary recommendations. From the beginning of the negotiations the strategy from the Danish government was to target harmonisation rules building on the foundations of the Danish mortgage model, such that Denmark should not in the future have to make a targeted effort each time new regulation comes up in order to make sure that the specialist mortgage bank model is not endangered. The specialist model is now specifically mentioned and defined in Article 3(8).

The content of the new rules very much reflects existing Danish legislation and hence mortgage banks are not expected to have to make large changes following implementation. However, a minimum OC requirement of 5% will be required, although this requirement can be lowered nationally to 2% if the OC-requirement is risk-based (as is the case in Denmark).

Other upcoming regulation

In June 2019 the EU banking package was adopted (BRRD II, CRD V and CRR II). The CRR II includes the EU implementation of the Basel III net stable funding ratio requirement as well as the minimum leverage ratio requirement of 3%. It is not expected that the regulation will affect mortgage banks a great deal as the match funding and extendable maturity triggers are recognised in the requirement of the NSFR and all mortgage banks have a sizeable leverage ratio buffer. The legislation must be applied from June 2021.

Further ahead the final implementation of the Basel III regulatory framework into EU law still awaits. This counts revisions to the IRB approaches for credit risk, the standard model for CVA, and standard and internal model approaches for market risk and the introduction of an output floor – the latter means that a bank's total risk-weighted exposure calculated using IRB approaches cannot constitute less than 72.5% of the risk-weighted exposure calculated using the standardised approaches.

[18] Added to this the following EU regulations also regulates covered bonds: Solvency II delegated act Article 180 (1), BRRD Article 44(2), LCR Delegated Act Article 11, 12 and 13, EMIR (the RTS define a specific treatment of cover pool derivatives, which are not cleared by a CCP).

The output floor is the most important for mortgage banks as these without exception make use of internal model approaches to calculate REA for mortgage lending exposures and are usually risk-weighted lower than using the standard approach. This is due to the generally low loss rates seen in Danish mortgage lending as compared to other Basel member countries meaning that IRB risk weights are relatively low. Calculations made by an expert group under the Ministry of Business, Industry and Financial Affairs showed in 2017 that the implementation of the Basel III proposal without modifications can lead to an increase of total capital requirements of the five largest SIFIs[19] of DKK78bn (+34%). Of this DKK37bn (+52%) can be referred to the increase of capital requirements on mortgage lending. A first proposal from the EU commission is expected during 2020.

Output floor can lead to a potentially large increase in capital requirements

Central bank eligibility

All Danish covered bonds in EUR and DKK are repo eligible at Danmarks Nationalbank. SDOs, SDROs and ROs are all treated with the same haircuts depending on time to maturity. It is also possible to post EUR bonds as collateral, which comes with an additional haircut of 5%, however. Some ISINs are eligible in Riksbanken and Norges Bank as well.

Some EUR denominated 'DK-' ISINs are repo eligible at the ECB, which is also the case for the EUR covered bonds issued by Jyske Realkredit with an 'XS-' ISIN. Previously the ECB did not accept EUR-denominated bonds as collateral not issued through a central securities depository in the euro area meaning that Danish mortgage banks started issuing out of a Luxembourg-based depository (VP Luxembourg) leading to the existence of 'LU-' ISINs. However, this is no longer needed today and VP Securities A/S closed its Luxembourg subsidiary in November 2018 after which all 'LU-' ISINs are now registered in Denmark.

Legislation regarding a ship finance institute

Ships are funded by Danmarks Skibskredit under the Act on a ship finance institute and the Executive Order on a Ship Finance Institute. The legislation regarding capital requirements and balance principles are very much the same as is the case for issuers of covered bonds secured by loans on real property. However, there are a few differences.

- The activities of a ship finance institute are confined to ship mortgage lending.
- Covered bonds secured on ship mortgages can be in the form only of SDOs. Note that a SDO cannot be secured by *both* ships and real property.
- A ship finance institute can issue both SDOs and ship mortgage bonds (SMBs). However, ship mortgages serving as collateral for SDOs must at all times comply with the relevant LTV limit, which is not the case for SMBs. Thus, SMBs do not comply with CRD and are thereby not to be considered 'covered' and carry larger risk weights.
- A ship finance institute may finance loans against the assets set out in CRR Article 129(1)a-c and Article 129(2) by the issuance of SDOs. This includes loans secured by maritime first liens on ships. If needed, supplementary collateral must be secured by the same asset types. SMBs can be issued only to finance ship mortgages.
- The LTV limit for ship mortgages serving as collateral for SDOs is 60% and 70% for SMBs.

[19] Danske Bank, Nordea Kredit, Jyske Bank, Nykredit and Sydbank.

3. Mortgage banks

In this chapter, we focus on mortgage banks and a ship finance institute. The specialist bank principle confines the activity of mortgage banks to mortgage lending funded by the issuance of covered bonds (mortgage bonds). Activities not directly linked to mortgage lending and mortgage bond funding are prohibited.

In return, mortgage banks are awarded the privilege of issuing covered bonds. Entities that are not licensed as mortgage banks do not have access to covered bond funding.

Mortgage banking market

Persistent demand for housing finance in Denmark has made the Danish covered bond market the largest in the world.

Table 8. Outstanding covered bonds in selected countries 2019 (EURm)

	Public Sector	Mortgage	Ships	Others	Mixed Assets	Total
Australia	-	65,855	-	-	-	65,855
Austria	16,926	42,001	-	-	-	58,928
Belgium	2,461	20,092	-	-	-	22,553
Brazil	-	454	-	-	-	454
Canada	-	107,496	-	-	-	107,496
Cyprus	-	650	-	-	-	650
Czech Republic	-	13,757	-	-	-	13,757
Denmark	4,375	396,246	5,370	-	-	405,991
Finland	-	37,257	-	-	-	37,257
France	64,482	194,227	-	-	62,602	321,311
Germany	134,717	233,372	1,154	505	-	369,747
Greece	-	13,840	-	-	-	13,840
Hungary	-	3,762	-	-	-	3,762
Iceland	-	3,123	-	-	-	3,123
Ireland	2,531	20,788	-	-	-	23,319
Italy	5,625	163,311	-	-	-	168,936
Japan	–	1,000	–	–	-	1,000
Latvia	-	-	-	-	-	-
Luxembourg	6,103	-	-	-	-	6,103
The Netherlands	-	94,797	-	-	-	94,797
New Zealand	-	9,803	-	-	-	9,803
Norway	1,784	119,398	-	-	-	121,182
Panama	-	10	-	-	-	10
Poland	79	4,925	-	-	-	5,004
Portugal	600	35,795	-	-	-	36,395
Singapore	-	8,466	-	-	-	8,466
Slovakia	-	4,858	-	-	-	4,858
South Korea	-	2,771	-	-	-	2,771
Spain	18,362	213,253	-	-	-	231,615
Sweden	-	217,979	-	-	-	217,979
Switzerland	-	119,422	-	-	-	119,422
Turkey	-	2,334	-	-	-	2,334
United Kingdom	4,662	93,530	-	-	-	98,192
United States	-	-	-	-	-	-
Total	262,706	2,244,572	6,524	505	62,602	2,576,909

Source: ECBC covered bond fact book 2019

Measured as a percentage of GDP, the Danish covered bond market is by far the largest covered bond market in Europe.

Table 9. Mortgages relative to size of economy 2019 – Denmark stands out

	GDP current prices (EURm)	Mortgages relative to GDP
Australia	1,273,789	5.2%
Austria	1,273,789	3.3%
Belgium	482,154	4.2%
Brazil	1,674,943	0.0%
Canada	1,522,024	7.1%
Cyprus	22,175	2.9%
Czech Republic	217,843	6.3%
Denmark	315,959	125.4%
Finland	245,841	15.2%
France	2,467,385	7.9%
Germany	3,506,814	6.7%
Greece	193,686	7.1%
Hungary	140,253	2.7%
Iceland	22,988	13.6%
Ireland	339,777	6.1%
Italy	1,851,172	8.8%
Japan	4,416,206	0.0%
Latvia	30,567	-
Luxembourg	62,970	-
The Netherlands	811,635	11.7%
New Zealand	182,041	5.4%
Norway	385,686	31.0%
Panama	57,791	0.0%
Poland	520,267	0.9%
Portugal	213,800	16.7%
Singapore	323,494	2.6%
Slovakia	94,079	5.2%
South Korea	327,164	0.8%
Spain	1,260,586	16.9%
Sweden	493,991	44.1%
Switzerland	626,401	19.1%
Turkey	685,218	0.3%
United Kingdom	2,536,464	3.7%
United States	18,250,282	-

Source: Danske Bank

Covered bonds in circulation by issuer

Danish covered bonds are issued by a total of seven mortgage banks (LR Realkredit is not included below and is as of end-2019 a wholly owned subsidiary of Nykredit A/S), of which DLR Kredit specialises in commercial lending. The fairly low number of issuers adds to the liquidity of the bonds issued.

In addition, market concentration is high, with Nykredit/Totalkredit and Realkredit Danmark accounting for 68.5% of all Danish krone covered bonds issued and 57.5% of all Danish euro covered bond issues.

Table 30. Volumes and market shares of Danish mortgage banks mid-June 2020

	DKK bonds		EUR bonds		Total volume	
Issuer	Volume (EURbn)	Share (%)	Volume (EURbn)	Share (%)	Volume (EURbn)	Share (%)
Nykredit Realkredit	167.1	41.8%	6.2	24.3%	166.8	40.7%
Realkredit Danmark	105.3	26.2%	0.8	3.0%	101.5	24.8%
Nordea Kredit	55.1	14.2%	0.8	3.0%	55.9	13.5%
Jyske Realkredit	45.3	10.6%	3.0	11.7%	46.3	10.7%
DLR Kredit	22.9	5.6%	0.3	1.2%	23.2	5.3%
Danske Bank	0.8	0.2%	13.5	52.8%	14.3	3.5%
Danmarks Skibskredit (ships)	4.9	1.3%	1.0	3.9%	5.9	1.4%
Total	**383.9**	**100.0%**	**25.5**	**100.0%**	**409.5**	**100.0%**

Note: For Jyske Realkredit and Danske Bank also including EUR issues registered on Euroclear
Source: Danske Bank

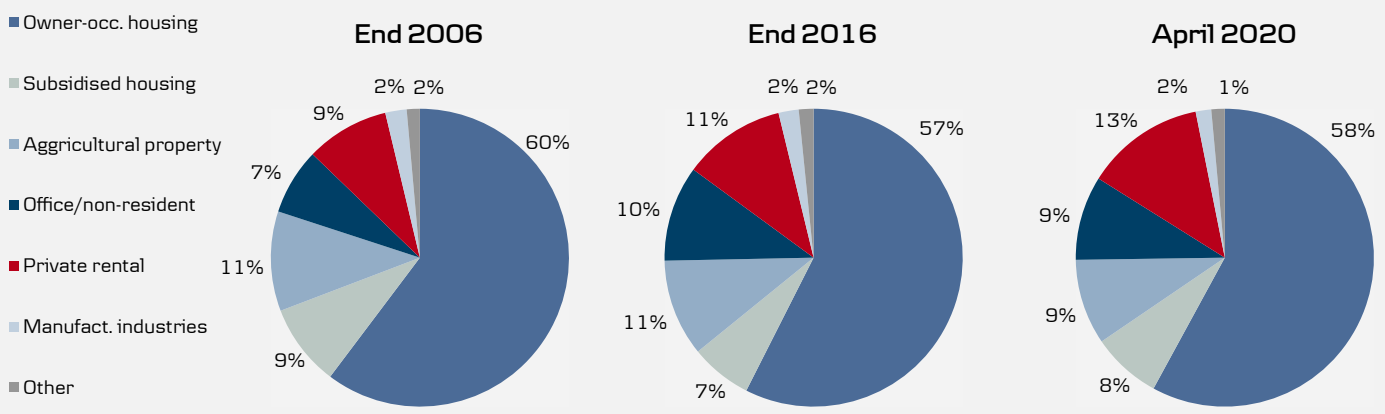
Portfolio segmentation

Mortgages on a variety of categories of real estate are eligible as collateral for mortgage bonds. However, mortgages on residential property dominate most collateral pools.

Mortgages on residential property dominate the Danish mortgage market and there have been only minor changes in the borrower composition over the past 15 years. In 2020, loans secured by mortgages on residential property accounted for 58% of total net new lending.

Residential property mortgages dominate collateral pools

Chart 13. Lending segments by property category as of end-2006, end-2016 and Apr-2020



Source: Danske Bank, Danmarks Nationalbank

Realkredit Danmark

Company profile

Realkredit Danmark (RD) is a wholly owned subsidiary of Danske Bank, the largest financial institution in Denmark. Danske was founded in 1871. Today, Danske Bank is a global bank with activities in northern Europe and the Baltic region under various brands. Its main business areas are retail banking, corporate banking, asset management, life insurance and pensions and mortgage finance.

RD was established in 1851 under the name Østifternes Kreditforening. In 2001, RD merged with Danske Kredit A/S and BG Kredit A/S following the merger of Danske Bank A/S and RealDanmark A/S. RD is the continuing mortgage credit arm of the Danske Bank Group and the second-largest specialist mortgage bank in Denmark, with a market share of 25%.

RD's covered bonds issued out of capital centre S and T and the general capital centre are rated 'AAA' by Standard & Poor's. Capital centre S is rated 'AAA' and capital centre T is rated 'AA+' by Fitch.

Financial performance

Realkredit Danmark reported an operating profit of DKK4.4bn in 2019, a decrease from DKK4.6bn in 2018. Administration margins fell slightly by DKK200m despite a record year in terms of remortgaging activities among borrowers totalling DKK155bn in RD alone. The cost/income ratio was at 12.1% – slightly higher when compared to 2018. Loan impairment charges were DKK265m in 2019, whereas the number in 2018 is clouded by the introduction of IFRS 9 starting 1 January 2018, which meant that mortgage banks took a correction to equity already in the beginning of that year corresponding to the higher expected credit losses. RD estimated that excluding the transitory effect of IFRS 9, loan impairment charges were DKK196m in 2018.

Capital ratios remain solid and RD currently has no outstanding additional tier 1 or tier 2 instruments. The arrears rate remains at historically very low levels.

Business model and funding profile

RD is a specialist mortgage bank subject to supervision by the Danish FSA. RD's objective is to carry out business as a mortgage bank, including any kind of business permitted by the Danish Mortgage Act. RD's principal market is Denmark, but Realkredit Danmark's geographical business area also includes mortgage lending to large business customers in Sweden and Norway.

RD's core markets in Denmark are residential housing – defined as lending for the financing of owner-occupied housing and holiday homes – and the corporate market, which comprises loans to customers with property in urban trade, agriculture and residential rental property.

All mortgages included in the cover pool are distributed through the branch networks of Danske Bank, RD Large Real Estate and the wholly owned real estate agent 'home' in Denmark. Realkredit Danmark also offers customers online and self-service solutions through the rd.dk and danskebank.dk websites.

Table 11. Ratings (M/S/F) – RD

Covered bond rating – CC S	WR/AAA/AAA
Covered bond rating – CC T	WR/AAA/AA+
Issuer rating	-/A/A

Source: Moody's, Standard & Poor's, Fitch, Danske Bank

Table 12. Financial information

DKKm	2019	2018
Administration margins	6,082	6,222
Fees and commissions	-528	-617
Investment portfolio	839	577
Pre-provision income	5,901	5,746
Loan impairment charges	265	-204
Operating profit	4,396	4,649
Cost/income ratio	12.1%	10.9%
Total capital ratio	31.1%	30.6%
Tier 1 capital ratio	30.7%	30.3%
Arrears rate	0.25%	0.33%
Repossessed properties	24	39

Source: Realkredit Danmark annual report 2019.

Table 13. Further information

Bond ticker	RDKRE
Websites	www.danskebank.com www.rd.dk

Source: Danske Bank

A management agreement exists between RD and Danske Bank, stating the following.

- The branch that originated the mortgages is responsible for all handling of customers.
- Danske Bank covers all losses (with an LTV of 60-80%) on mortgages originated at Danske Bank branches.
- RD receives all payments directly from customers. In turn, RD pays provisions to Danske Bank.

As at the end of 2019, loss guarantees issued by Danske Bank amounted to DKK53bn partly covering lending of DKK270bn.

All mortgages are transparent (pass-through), which means that consumers have a delivery option on the underlying bonds. Interest-reset loans are funded by a portfolio of fixed-rate non-callable bonds, while other types of mortgages are funded individually by issuing bonds with exactly the same characteristics as the mortgages.

Mortgages backing covered bonds issued by RD are divided into different cover registers (capital centres). According to the revised Mortgage Act, new SDROs must be issued out of separate capital centres. Therefore, since July 2007, SDROs have been issued out of capital centre S. Existing RO series in the general capital centre have been closed for new issuance since the end of 2007 and are grandfathered according to the CRD. Since 2011, RD has issued all new interest-reset loans (ARMs) out of capital centre T and a large part of the interest-reset loans in capital centre S has been refinanced into the new capital centre T, starting from the refinancing auctions set for December 2011. Today, the majority of the total mortgage book is included in capital centre S and capital centre T. In 2018 RD opened capital centre A for the funding of interest-reset loans to social housing unions with a government guarantee. This capital centre is not rated.

Realkredit opened a 6M CIBOR floater RO bond (*Realkreditobligationer*) issued out of the general capital centre in 2015 and in 2018 this was refinanced into DK0004609823. This bond does not comply with the CRD and hence does not get preferential treatment in terms of risk weighting. The bond currently sees only very limited issuance.

Cover pool and asset quality

As at Q1 20, the cover pools for capital centre S and capital centre T totalled DKK294bn and DKK468bn, respectively. Capital centre S cover assets consist mostly of residential housing at 80% of the cover pool. The cover pool consists almost solely of fixed rate callable mortgages (99%) with a large overweight of amortising loans. Capital centre T cover assets are more diversified across both asset types and geography, although solely containing loans with a floating rate. Of mortgages 30% are secured on commercial property, reflecting the preference for the types of mortgages to primarily be in the form of floating rate. RD funds NOK and SEK loans out of this capital centre as well by issuance in NIBOR and STIBOR linked floaters. NOK and SEK loans make up 4% of this cover pool.

Table 14. Cover pool info – Capital Centre S

Capital Centre S	DKK294bn
JCBs/SNP	DKK0bn
WA Indexed LTV	59% LTV
Over-collateralisation	7.0%
Interest-only mortgages	25%
Fixed-rate loans	99%
Geography	DK
- Metropolitan area	46%
- Other Zealand	14%
- Norther region	6%
- Eastern Jutland	17%
- Southern region	17%
- Other area	0%
Asset type	
- Residential	80%
- Private rental	8%
- Agriculture	4%

Source: ECBC template Q1 '20 from Realkredit Danmark.

Table 15. Cover pool info – Capital Centre T

Capital Centre T	DKK468bn
JCB/SNP*)	DKK4bn
WA Indexed LTV	57%
Over-collateralisation	6.6%
Interest-only mortgages	52%
Fixed-rate loans	0%
Geography	DK, SE, NO
- Metropolitan area	45%
- Other Zealand	13%
- Northern region	5%
- Eastern Jutland	16%
- Southern region	17%
- Other area	4%
Asset type	
- Residential	70%
- Private rental	12%
- Agriculture	8%

** Loan from parent*
Source: ECBC template Q120 from Realkredit Danmark

Danske Bank

Company profile

Danske Bank A/S (Danske Bank) is part of the Danske Bank Group, which also includes the wholly owned subsidiaries Realkredit Danmark (one of the largest Danish mortgage credit institutions) and Danica Pension (a leading Danish life insurance company).

Danske Bank is the largest bank in Denmark, where it operates 94 branches and holds market shares in deposits and lending of 29% and 26%, respectively (Q4 '19 figures). However, the group also has a significant Nordic presence with operations (market shares of lending) in Finland (9.5%), Sweden (5.6%) and Norway (6.3%) as well as Northern Ireland (20%). Danske previously also had a share of lending in the Baltic countries, but that business line was closed down in 2019.

Danske Bank provides a wide range of banking products and services to retail, corporate and institutional clients. It has four main operating units: Personal Banking, Business Banking, Corporates & Institutions and Wealth Management. The group also reports its business activities in Northern Ireland as a separate unit, as well as a non-core division (consisting mainly of the portfolio of Baltic exposures, which are being wound up) and other activities (group treasury, group support functions and eliminations).

As of Q4 '19, Danske Bank reported total lending of DKK1,728bn before loan impairment charges. Of this amount, Personal Banking and Business Banking exposures in Denmark accounted for 45%, followed by C&I (29%) and Personal Banking and Business Banking exposures in Sweden (11%). Total credit exposures amounted to DKK2,476bn, of which personal customers accounted for 38%, followed by commercial property (13%), public institutions (9%), and private housing co-ops (8%).

Danske Bank's issuer ratings from Moody's, S&P and Fitch are 'A3' (negative), 'A' (stable) and 'A' (negative), respectively. Most recently, Moody's lowered the outlook to 'negative' from 'stable' following a risk of higher credit losses in general in the Danish banking sector following COVID-19, in Moody's view. Danske Bank's covered bonds issued out of cover pools D, I and C are rated AAA by S&P and Fitch.

Financial performance

In 2019, Danske Bank Group posted pre-tax profits from core activities of DKK14.3bn, a decrease of DKK 5.7bn relative to 2018. Total income was more or less unchanged at DKK45bn, up 1% from the level in 2018. Net interest income totalled DKK22bn and was slightly lower than in 2019. Net interest income has in general been fading among Danish banks following a negative interest rate policy from Danmarks Nationalbank since 2012. However, in 2019 most banks started imposing negative interest rates on deposits from retail clients, which will help to stabilise this source of income. Profits fell 30% following larger operating expenses and goodwill impairment charges.

At the end of 2019, the total capital ratio was 22.7% and the common equity tier 1 (CET1) ratio was 17.3%. Danske operates with targets for both capital measure with a total capital ratio target of above 20% and a CET1 ratio above 16%. Currently, Danske meets both requirements, but temporary Pillar II requirements stemming partly from the Estonia case mean that the solvency need will probably fall slightly in the years to come.

Table 16. Ratings (M/S/F)

Covered bond rating	-/AAA/AAA (D/I/C)
Issuer rating	A3 / A / A
S&P unused notches	1 / 3 / 1

Source: Moody's, Standard & Poor's, Fitch, Danske Bank

Table 17. Financial information

DKKm	2019	2018
Net interest income	21,877	23,571
Fees & commissions	15,895	15,402
Net trading income	4,985	4,676
Loan impair. charges	1,516	-650
Profit before tax, core	14,315	20,004
Cost/income ratio	64.8%	56.4%
Total capital ratio	22.7%	21.3%
CET1% capital ratio	17.3%	17.0%

Source: Danske Bank Annual Report 2019

Table 18. More information

Bond ticker	DANBNK
Website	www.danskebank.com/ir

Source: Danske Bank

Business model and funding profile

Danske Bank is a universal bank subject to supervision by the Danish FSA. The group has a well-diversified funding platform including a solid deposit base. Much of the lending consists of Danish mortgages, financed by Realkredit Danmark (RD) pass-through covered bonds. However, the group also issues covered bonds under the Danske Bank name in SDO format under the Danish Covered Bond Act. In addition, Danske Bank issues covered bonds through its Finnish subsidiary Danske Bank Plc and Danske Hypotek under Swedish legislation (see *Nordic Covered Bond Handbook: The handbook of the Nordic covered bond markets and issuers*, 4 September 2018).

Within its EUR30bn SDO covered bond programme, Danske Bank has three active cover pools, which it uses to issue covered bonds directly on its balance sheet. Cover pool D ('domestic') comprises 100% Danish residential mortgages, while cover pool I ('international') and C ('combined') include Norwegian and Swedish mortgages originated by Danske Bank. Cover pool I is purely residential, but is undergoing a structural change, as Swedish mortgages are being migrated into the cover pool of Danske Hypotek and the cover pool will thus over time comprise purely Norwegian residential assets, which is currently almost already the case. Cover pool C contains a mix of residential and commercial mortgages, originating from both Sweden and Norway. According to the issuer, eligible Swedish assets may migrate into the Danske Hypotek cover pool after 2020.

Danske Bank issues covered bonds in EUR benchmark format out of all its cover pools, but Cover Pool I is primarily dedicated to NOK funding and currently NOK2bn is outstanding here. Apart from EUR and NOK Danske Bank has two issues in CHF out of cover pool I and one issue in DKK out of cover pool D. The latter was issued at a point in time where the EUR/DKK basis swap was relatively unfavourable.

Cover pool and asset quality

As of Q1 20, cover pool D totalled DKK28bn and consisted mostly of 'Prioritet Plus' mortgage loans, which offer the borrower the flexibility to draw down partially or repay amounts held in a dedicated savings account. In a bank's default scenario, the borrower cannot set off the deposit account against its loan account, thus protecting bondholders against set-off risk. In recent years Danske has started offering also interest-reset mortgages, which are callable at any time. The underlying assets are residential properties in Denmark (93% primary homes). For a majority of the loans in the cover pool the interest rate is fixed for less than one year (93%).

Cover pool I amounted to DKK97bn and comprised 86% Norwegian and 14% Swedish mortgages. The underlying properties are mostly owner occupied (96%). The majority of mortgages are floating rate (76%) and amortising.

Cover pool C stood at DKK71bn and comprised Swedish and Norwegian mortgage assets – consisting mainly of offices (40%), private rental (34%) and properties used for manufacturing industries (15%). The 7,273 loans in the cover pool C, which corresponds to an average loan size of DKK9.8m, reflect the more business-oriented nature of the pool.

Loans in arrears (over 90 days) are not allowed in any of the cover pools. Furthermore, Danske Bank commits to a voluntary minimum over-collateralisation of 2% (agreed with the Danish FSA). However, due to the new CB directive coming into force in July 2022 this OC level will be a regulatory minimum requirement. Approval of mortgages by Danske Bank is based on a strict credit policy, identical to that of Realkredit Danmark.

Table 19. Funding sources (Q4 19, excl. RD pass-through covered bonds)

Deposits	63%
Covered bonds	15%
Preferred and non-preferred senior unsecured	10%
Interbank deposits	6%
CD & CP	1%
Repos (net)	-7%
Subordinated debt	2%
Equity	11%

Source: Danske Bank Debt Investor Update Q1 17

Table 20. Cover pool info (D, I, C)

Cover Pool D	**DKK 28bn**
Residential mortgages	100%
Average loan size	580,000
Over-collateralisation (committed)	11.3% (2%)
WA indexed LTV	52%
Arrears (>90 days)	None
Floating rate	74%
Interest-only loans	30%
Geography	DK
- Metropolitan Area	40%
- Other Zealand	14%
- Northern Region	5%
- Eastern Jutland	17%
- Southern Region	23%
Asset type	
- Primary home	93%
- Secondary home	7%

Cover Pool I	**DKK 97bn**
Residential mortgages	100%
Avg. loan size	1,317,000
Over-collateralisation (committed)	13% (2%)
WA indexed LTV	57%
Arrears (>90 days)	None
Floating rate	76%
Interest-only mortgages	29%
Geography	
- Norway	86%
- Sweden	14%
Asset type	
- Owner-occupied	96%
- Holiday homes	4%
- Other	0%

Cover Pool C	**DKK 71bn**
Res. mtg. (R)	35%
Com. mtg. (C)	65%
Avg. loan size (R/C)	DKK10m/DKK9m
Over-collateralisation (committed)	22% (2%)
WA indexed LTV (R/C)	51%/52%
Arrears (>90 days)	None
Floating rate (R/C)	20%/37%
Interest-rate only (R/C)	11%/15%
Geography	
- Sweden (R/C)	31%/43%
- Norway (R/C)	3%/22%
Property type	
- Offices and businesses	40%
- Private rental	34%
- Industry	15%
- Agriculture	10%

Source: ECBC template Q1 20 from Danske Bank

Nykredit Realkredit

Company profile

Nykredit Realkredit (NYK) is a wholly owned subsidiary of Nykredit A/S. Nykredit A/S is an unlisted holding company owned by Forenet Kredit (79%), PFA Pension (10%) and seven other pension funds/investment funds. As a mortgage association, Nykredit Realkredit originated in 1851. Today, besides mortgage finance, Nykredit is active in retail and corporate banking, asset management, insurance and real estate. Mortgage finance is the most important business area. Forenet Kredit and Nykredit's Board of Directors decided in 2016 to prepare for an IPO due to Nykredit not having any access to equity markets. The board's view was that a listing would make for a flexible way to raise funding and limit the need for large capital buffers thereby lowering cost of capital. However, in November 2017 Forenet Kredit decided to sell 11% of its shares in Nykredit A/S to a group of Danish pension funds, who will be able to inject equity into Nykredit if needed. Thus, the plans of an IPO were shelved.

In 2003, Nykredit Realkredit acquired Totalkredit (TOT), which is currently a wholly owned subsidiary of Nykredit A/S. Following the acquisition of Totalkredit, Nykredit became the largest specialist mortgage bank in Denmark, with a current market share based on outstanding mortgages of 41.1% at June 2020. There are nearly 60 partner banks in the Totalkredit corporation network, making it crucial for the distribution of Nykredit Realkredit mortgages. Nykredit Realkredit and both local and regional banks are competitors in agricultural mortgage and non-mortgage markets. In 2008, Nykredit Realkredit acquired Forstædernes Bank, which increased Nykredit Realkredit's market share within banking to 5.2%. Forstædernes Bank subsequently merged with Nykredit Bank and the market share as of Q1 17 was 6.7% – in Q4 '19 the market share was 5%. In December 2019 Nykredit A/S took over the specialist mortgage bank LR Realkredit, who specialises in lending targeted housing co-ops and social housing.

Nykredit's covered bonds issued out of capital centres E and H are rated 'AAA' by S&P. Nykredit has a 'A+' long-term rating from S&P and 'A' from Fitch.

In 2018, Nykredit opened capital centre J for the funding of interest-reset loans to social housing unions with a government guarantee. This capital centre is not rated.

Table 21. Ratings (M/S/F)

Covered bond rating – CC E:	WR/AAA/-
Covered bond rating – CC H	WR/AAA/-
Issuer rating:	A3*)/A+/A

** Unsolicited rating*
Source: Moody's, Standard & Poor's, Fitch, Danske Bank

Table 22. Financial information

DKKm	2019	2018
Net interest income	9,344	9,226
Fees and commissions	2,739	1,950
Investment portfolio	1,673	89
Loan impairment charges	994	380
Operating profit	8,335	6,777
Cost/income ratio	36.3%	40.5%
Total capital ratio	23.7%	25.4%
Tier 1 capital ratio	19.5%	21.0%
Arrears rate	0.35%	0.39%
Repossessed properties	32	81

Source: Nykredit, Danske Bank

Table 23. More info

Bond ticker	NYKRE
Website	www.nykredit.com

Source: Nykredit, Danske Bank

Financial performance

Nykredit Group reported operating profit of DKK8.3bn in 2019 – an increase from the 2018 level of DKK6.7bn (note that administration margins from mortgage lending are included in the 'net interest rate income' figure). The result was primarily driven by higher fees stemming from large prepayment activity as well as income from the investment portfolio.

Capital ratios in general decreased in line with the target as Nykredit operates with a target CET1% of 15.5-16.5%. The arrears rate (75 days) as of Q4 19 was 0.35% – a slight fall from the 2018 level. The number of repossessed properties decreased from 81 to 32 from 2018 to 2019.

Business model and funding profile

Nykredit Realkredit is a specialist mortgage bank subject to supervision by the Danish FSA. Banking, asset management and insurance activities are carried out by wholly owned separate subsidiaries. As mentioned above, Totalkredit is also a wholly owned subsidiary of Nykredit Realkredit. Retail and commercial customers are offered mortgages through Nykredit's distribution channels, which include 43 full-service customer centres, Nykredit.dk, mobile app downloads, a central customer services centre and the real estate agencies of the Nybolig and Estate chains.

In 1994, local and regional banks in Denmark established Totalkredit as a joint mortgage bank. Since the acquisition of Totalkredit in 2003, Nykredit Realkredit has developed a partnership with 56 Danish local and regional banks (including Nykredit Bank) with substantial distribution networks. These local and regional banks sell mortgage products under the Totalkredit brand. They also deliver the large majority of growth in mortgage lending.

Denmark is the largest market for Nykredit Realkredit and Totalkredit. In addition, Nykredit Realkredit provides loans secured by residential property in Sweden. Totalkredit offers only mortgages secured on residential property, while Nykredit Realkredit's core markets in Denmark are in residential housing and commercial properties, which comprise loans to customers for urban trade, agriculture and residential rental properties.

A management agreement exists between Nykredit Realkredit/Totalkredit and the local and regional banks. The agreement states the following.

- The branch that originated the mortgage is responsible for all handling of customers.
- The bank that originated the mortgages covers all losses (LTV between 60% and 80%) on mortgages originated by said bank.
- Totalkredit receives all payments directly from customers. In turn, it pays provisions to the banks.

From 2005, Nykredit Realkredit and Totalkredit have been jointly funded and until 2008 all mortgages originated by Nykredit Realkredit or Totalkredit were funded by covered bonds issued out of Nykredit Realkredit capital centre D. According to the revised Mortgage Act, new SDOs must be issued out of separate capital centres. Therefore, since 1 January 2008, Nykredit Realkredit/Totalkredit has issued SDOs out of capital centre E, with existing series in capital centre D closed at the end of 2007. The series in capital centre D was grandfathered according to the CRD. Nykredit announced in June 2011 that existing interest-reset and floating-rate loans – issued out of capital centre E – would be refinanced into the new capital centre H starting from the refinancing auction in September 2011. Hence, since then joint funding has been carried out from capital centre E for fixed-rate loans and from capital centre H for interest-reset and floating-rate loans.

In 2014, Nykredit's 'second joint funding model' was established. This works such that partnership banks of Totalkredit can fund mortgage lending through the use of covered bonds by selling the loans to Nykredit, who then issues match funded SDOs[20]. The loans are callable with a variable interest rate based on the 3M CITA fixing, and Nykredit issues bonds with the same characteristics – match funding is thus preserved. This is beneficial for banks without the set-up to issue covered bonds themselves since funding a mortgage over 30 years essentially through deposits creates liquidity risks.

The Danish FSA has shown some concern for the joint funding arrangements as partnership banks might suddenly be in need of instant liquidity meaning a large demand to transfer loans to Nykredit at a point in time when funding markets might have dried up. However, Nykredit has established limits to the amount of loans the partnership banks can transfer during a period of 12 months, which shields Nykredit from a sudden large need to issue covered bonds.

Table 24. Cover pool info – Capital Centre E

Capital Centre E	DKK531bn
JCBs/SNP	DKK 0.9bn
WA indexed LTV	66%
Over-collateralisation	3.5%
Interest-only mortgages	30%
Fixed-rate loans	99%
Geography	DK
- Metropolitan area	27%
- Other Zealand	12%
- Northern region	14%
- Eastern Jutland	25%
- Southern region	21%
- Other area	0%
Asset type	
- Residential	93%
- Private rental	5%
- Agriculture	2.5%

Source: ECBC template Q1 20 from Nykredit

Table 25. Cover pool info – Capital Centre H

Capital Centre H	DKK618bn
JCBs/SNP	DKK 1.2bn
WA indexed LTV	61%
Over-collateralisation	3.5%
Interest-only mortgages	66%
Fixed-rate loans	1%
Geography	DK, DE, SE
- Metropolitan area	30%
- Other Zealand	12%
- Northern region	13%
- Eastern Jutland	25%
- Southern region	20%
- Other area	6%
Asset type	
- Residential	78%
- Private rental	12%
- Agriculture	7%

Source: ECBC template Q1 20 from Nykredit.=

[20] Since 2003, banks have been able to offer 'prioritetslån', which are mortgage loans with a first lien claim.

Nykredit introduced two-tier mortgaging for commercial borrowers in 2009 and residential borrowers in Q2 12, as a way to limit the need to fund supplementary collateral at times with large downward price corrections in the housing market. This works such that all new loans are funded using SDO covered bonds up to an LTV of 45% for commercial real estate and 60% for residential real estate, while the top 15% and 20%, respectively, is funded using RO bonds issued out of capital centres G and I. Furthermore, the top loan had to be amortising. Since mid-2014, Nykredit once again offers one-tier mortgaging for residential loans with an LTV up to 80%.

All in all, Nykredit currently has four active capital centres: Capital Centre H (SDO, non-matched maturity funding), Capital Centre E (SDO, matched-maturity funding), Capital Centre G (RO, non-matched maturity funding) and Capital Centre I (RO, matched-maturity funding). By far the largest amount of issuance takes place out of capital centres E and H.

Starting in 2017, all commercial floating rate loans in Capital Centre D will be refinanced into Capital Centre G in order to increase the outstanding amount in each bond series and thus improve the LCR levels in general.

Cover pool and asset quality

As at Q1 20, Nykredit Realkredit's capital centres E and H totalled DKK531bn and DKK618bn, respectively, of which 99% and 94%, respectively, was Danish-based mortgages. These are secured on residential (93% and 78%, respectively), agricultural (3% and 7%, respectively) and commercial properties (4% and 14%, respectively). Capital Centre E comprises only fixed rate callable mortgages, while Capital Centre H comprises only interest-reset and adjustable rate loans. Besides lending to Denmark, Germany and Sweden, there is also a smaller share of French (1.0%) and Spanish (1.2%) mortgages in the cover pool.

Nordea Kredit

Company profile

Nordea Kredit Realkreditaktieselskab (NDA) is a wholly owned subsidiary of Nordea Bank Danmark, which is part of the Nordea Group. In 1997, Sweden's Nordbanken merged with Finnish Merita Bank to form MeritaNordbanken. In 2000, Denmark's Unibank merged with MeritaNordbanken, which, at the same time, changed its name to Nordea. Later in 2000, Norway-based Christiania Bank joined the newly formed Scandinavian banking group. Today Nordea is the largest bank in Scandinavia, with activities in Scandinavia, the Baltic region and Russia.

Nordea's main business areas include retail banking, corporate banking, asset management, life insurance, pensions and mortgage finance.

NDA began its mortgage activities in September 1993. Initially, it provided lending only for residential properties and holiday homes but it now offers mortgage loans for most types of property. NDA's share of the domestic mortgage market as at June 2020 was 13% (mortgage loans at nominal value as a share of all Danish mortgage bank loans).

Nordea's long-term issuer ratings from Moody's, S&P and Fitch are 'Aa3', 'AA-' and 'AA-' with a 'negative' outlook. Covered bonds issued by NDA have 'AAA' ratings from S&P.

Financial performance

Nordea Kredit reported operating profit of DKK2.3bn for 2019, an increase from the 2018 level of DKK2.0bn. Net interest income was roughly unchanged at DKK3.2bn (note that administration margins from mortgage lending are included in the 'net interest rate income' figure). The higher profit for the year can be attributed to the increase in prepayments and general large remortgage activity throughout 2019 (note that administration margins from mortgage lending are included in the 'net interest rate income' figure). The total capital ratio and the tier 1 capital ratio both increased 0.5%-points. During H1 20 Nordea plans to issue additional tier 2 capital of DKK1.5bn to the parent company Nordea Bank in order to meet the debt buffer and capital requirements with a satisfactory margin. The issuance will raise the total capital ratio by 1.8%-point to 28.8% (measured end 2019).

The arrears rate (above 3M) and repossessed properties are generally low.

Business model and funding profile

NDA is a specialist mortgage bank subject to supervision by the Danish FSA. Its objective is to carry on business as a mortgage bank, including any kind of business permitted pursuant to the Danish Mortgage Act. NDA has mortgage credit activities only in Denmark, while all mortgages in the cover pool are secured on properties situated in Denmark. All mortgages included in the cover pool are distributed through Nordea's branch network and that of the real estate chain DanBolig.

A management agreement exists between NDA and Nordea Bank Danmark. It states the following: Nordea Bank Danmark A/S provides a guarantee for the upper 25% of mortgage loans originated by the bank. For loans granted for non-profit housing, youth housing and housing for the elderly, there is only a 10% guarantee. For loans for all-year dwellings, co-operative housing, private rental housing, non-profit rental housing and properties for social, cultural and educational purposes, the guarantee covers that part of the mortgage loan that exceeds 60% of the valuation made in conjunction with the loan origination process. For loans granted to agricultural properties, the guarantee covers that part of the mortgage loan that exceeds 55% of the valuation made in conjunction with the loan origination process.

Table 26. Ratings (M/S/F)

Covered bond rating	WR/AAA/-
Issuer rating	Aa3/AA-/AA-

Source: Moody's, *Standard & Poor's, Fitch, Danske Bank.*

Table 27. Financial info

DKKm	2019	2018
Net interest income	3,156	3,190
Fees and commissions	-486	-635
Investment portfolio	13	-18
Pre-provision income	2,379	2,257
Loan impairment charges	6	215
Operating profit	2,373	2,042
Cost/income ratio	11.4%	11.3%
Total capital ratio	27.0%	26.5%
Tier 1 capital ratio	24.4%	23.9%
Arrears rate	0.31%	0.27%
Repossessed properties	12	59

Source: Nordea Kredit, Danske Bank

Table 28. More info

Bond ticker	NDASS
Website	www.nordea.com

Source: Nordea, Danske Bank

For loans granted to recreational dwellings, industrial and craftsmen's properties, office and retail properties and collective energy supply plants, the guarantee covers that part of the loan that exceeds 45% of the valuation made in conjunction with the loan origination process.

The guarantee period begins when the loan is disbursed or remortgaged. The former guarantee period of 10 years or five years for loans granted to owner-occupied, all-year and recreational dwellings changed to the lifetime of the loan on 9 December 2013.

As at the end of 2019, guarantees from Nordea Bank Danmark A/S covered loans worth DKK387bn, of which guarantees amounted to DKK115bn.

The management agreement between NDA and Nordea Bank Denmark also includes the following.

- The branch that originated the mortgage is responsible for all customer handling.
- NDA receives all payments from customers directly. In turn, NDA pays provisions to Nordea Bank Denmark.

The mortgages backing the covered bonds issued by NDA are divided into different cover pools (capital centres). According to the revised Mortgage Act, new SDROs must be issued out of separate capital centres. Therefore, at the end of 2007, NDA closed the RO capital centre 1 and subsequently grandfathered the existing series according to the CRD and new SDROs have been issued out of Capital Centre 2. Capital Centre 2 holds 96% of the total mortgage book.

Cover pool and asset quality

As at Q1 20, Capital Centre 2 totalled DKK461bn and consisted entirely of Danish-based mortgages. These are secured mainly on residential mortgages and carry a fixed rate.

Table 29. Cover pool info – Capital Centre 2

Capital Centre 2	DKK 461bn
JCBs/SNP*)	DKK 0.7bn
WA indexed LTV	61%
Over-collateralisation	8.7%
Interest-only mortgages	46%
Fixed-rate loans	72%
Geography	DK
- Metropolitan area	42%
- Other Zealand	18%
- Northern region	4%
- Eastern Jutland	21%
- Southern region	15%
- Other area	0%
Asset type	
- Residential	78%
- Private rental	6%
- Agriculture	10%

** Loan from parent, Nordea Bank Abp*
Source: ECBC template Q1 20 from Nordea Kredit

Jyske Realkredit

Company profile

Jyske Realkredit was established under the name BRFkredit in 1959 as an independent business foundation authorised to grant third-lien mortgages. Originally, it was intended that BRFkredit grants mortgage loans for specific purposes. Until 30 April 2014, BRFkredit was an independent specialist mortgage bank providing customers with financial solutions and other services connected with real estate and was wholly owned by BRFfonden, an independent business foundation, through the holding company BRFholding. On 30 April 2014, a merger between BRFkredit and Jyske Bank A/S came into effect after which BRFkredit was owned by Jyske Bank A/S with BRFholding obtaining 25.6% of the total amount of shares outstanding in Jyske Bank. In 2018 BRFkredit changes its name to Jyske Realkredit. Jyske Realkredit continues as a subsidiary subject to Danish mortgage finance legislation. Today, Jyske Bank plus Jyske Realkredit is the fourth largest financial institution in Denmark and Jyske Realkredit has an 11% share of the total Danish mortgage market.

Jyske Realkredit issues SDO covered bonds in the form of traditional pass-through callable bonds and partly through EUR syndications. In addition, Jyske Realkredit adheres to the general balance principle.

In October 2019, S&P assigned Jyske Bank an 'A' rating with a 'stable' outlook up from 'A-'. This was so as Jyske had through issuance of Senior non-preferred debt increased its additional loss-absorbing capacity (ALAC). Jyske Realkredit's capital centres are all assigned 'AAA' ratings by S&P and Fitch. Jyske Realkredit still issues RO bonds out of Capital Centre B although to a very limited extent and only floaters and short-dated ARMs – currently DKK770m new RO bonds are outstanding.

In 2018 Jyske Realkredit opened capital centre S for the funding of interest-reset loans with a government guarantee to social housing. This capital centre is not rated.

Financial performance

Jyske Realkredit reported an operating profit of DKK1.1bn in 2019, an increase from the 2018 level of DKK999m. Jyske Realkredit cites large remortgaging activity from borrowers as the prime reason. Note that as of 2019 Jyske Realkredit and Jyske Bank entered into a new agreement regarding intra-group fees and costs. This affects net fees and provisions. The agreement means that Jyske Realkredit pays a distribution fee on all mortgage loans as well as jointly funded bank mortgage loans. On the other hand, administration margins enter gross in Jyske Realkredit's annual reports. Loan losses and provisions increased from DKK-32m to DKK35m (excl. IFRS 9 the loan impartment charges were DKK369m in 2018). The core capital ratio increased from 18.9% as of 31 December 2015 to 19.0% as of 31 December 2016.

The arrears rate (90 days) was 0.0% as at end-December 2019, down from 0.2% in 2018.

Business model and funding profile

Jyske Realkredit is a specialist mortgage bank subject to supervision by the Danish FSA. It offers mortgages through Jyske Bank A/S and several partnerships. For example, Jyske Realkredit has entered into agreements with a range of independent real estate agencies and financial institutions. In 2012, Jyske Realkredit entered into a range of referral agreements with enterprises that meet the customers before a financing requirement arises, for instance estate agents and companies operating in energy renovation and large consumer durables.

Table 30. Ratings (M/S/F)

Covered bond rating	WR/AAA/-
Issuer rating	WR/A/-

Source: Moody's, Standard & Poor's, Fitch, Danske Bank

Table 31. Financial information

DKKm	2019	2018
Administration margins	2,334	1,896
Fees and commissions	-641	256
Investment portfolio	6	-84
Pre-provision income	1,468	1,631
Loan impair. charges	35	-38
Operating profit	1,117	999
Cost/income ratio	17.4%	31.0%
Total capital ratio	23.1%	22.1%
Tier 1 capital ratio	23.1%	22.1%
Arrears rate	0.0%	0.2%
Repossessed properties	15	15

Source: BRFkredit, Danske Bank

Table 32. More info

Bond ticker	BRF
Website	www.brf.dk

Source: BRFkredit, Danske Bank

Jyske Realkredit offers mortgages secured on properties in Denmark, specialising in those used for residential properties and office and shop premises. Loans for residential properties, including owner-occupied homes, co-operative homes, rental homes and publicly subsidised housing projects, comprise most of the total mortgage book. BRFkredit's main lending segments are owner-occupied dwellings and vacation homes.

Mortgage-backed covered bonds issued by Jyske Realkredit are divided into different cover registers (capital centres). Bonds issued prior to 31 December 2007 were issued out of capital centre B and are grandfathered to the CRD. New ROs are also issued from capital centre B, to a very limited extent, but they do not comply with the CRD and hence do not get preferential treatment in terms of risk weighting. According to the revised Mortgage Act, any new SDOs must be issued out of separate capital centres and new SDOs are issued out of capital centre E.

Jyske Realkredit first entered into a joint funding agreement with Jyske Bank and Sydbank in February 2012 and Arbejdernes Landsbank shortly afterwards (June 2012), all of which were Totalkredit partnership banks at the time. The Danish FSA approved the joint funding model in 2012 and it enabled financial institutions to fund private residential mortgage loans through Jyske Realkredit for a fee. The mortgages were funded through Jyske Realkredit's SDO covered bond programme and must comply with the requirements of Danish mortgage finance legislation. Furthermore, the underwriting standards must comply with Jyske Realkredit's policies. Following the merger with Jyske Bank in April 2014, the joint funding agreement with Jyske Bank continued whereas the Totalkredit partnership banks chose to withdraw from the agreement and team up with Nykredit/Totalkredit instead through the 'second joint funding agreement' (see section on Nykredit Realkredit).

Since 2016, Jyske Realkredit has financed part of its mortgage lending by issuing in EUR benchmark format and was the first specialist mortgage bank to do so. The currency and interest-rate risks between the loans denominated in DKK and the bonds in EUR are fully hedged through swaps. The EUR funds are kept separate from DKK funds and used for specific loan types. Also it is stated in the loan documentation where needed that there is not a 1:1 correspondence between the bond issued and the loan. As of June 2020, Jyske Realkredit had issued five EUR-denominated SDO bonds for a total of EUR 3bn. See table below.

Table 33. EUR-denominated SDO bonds

ISIN	Name	Outstanding amount	Issue date
XS1385173734	BRF 0.25 01APR2021	500,000,000	23-Mar-2016
XS1435774903	BRF 0.25 01JUL2023	750,000,000	22-Jun-2016
XS1514010310	BRF 0.50 01OCT2026	750,000,000	03-Nov-2016
XS1669866300	BRF 0.375 01JUL2024	500,000,000	30-Aug-2017
XS1961126775	JYSK 0.375 01APR2025	500,000,000	12-Mar-2019

Source: Jyske Realkredit, Danske Bank

Cover pool and asset quality

As of Q1 20, Jyske Realkredit's capital centre E stood at DKK310bn, made up of 99% Danish-based loans. The average LTV ratio is 62%. A large share of assets is secured on private rental properties and in general residential mortgages make up the lion's share of the cover pool. In 2019 Jyske Realkredit made a private placement with Jyske Bank for a SNP issuance worth DKK750m.

Table 34. Cover pool info – Capital Centre E

Capital Centre E	DKK 310bn
JCBs/SNP	DKK 0.8bn
WA indexed LTV	52%
Over-collateralisation	6.4%
Fixed-rate loans	67%
Interest-only loans	47%
Geography	DK, FO
- Metropolitan area	46%
- Other Zealand	12%
- Northern region	7%
- Eastern Jutland	21%
- Southern region	14%
- Other area	1%
Asset type	
- Residential	85%
- Private rental	17%
- Agriculture	0%

Source: ECBC template Q1 20 from Jyske Realkredit

DLR Kredit

Company profile

'Dansk Landbrugs Realkreditfond' (DLR) is a Danish mortgage lender, specialised in agricultural and commercial mortgages. DLR was founded in 1960 on the initiative of the banks and savings banks associations (now the Danish Bankers Association). DLR's formation was driven by farmers' requirements for long-term capital in the 1950s, which were covered only partially by first- and second-lien mortgage banks. Lack of funding resulting from the hesitant lending policies of first- and second-lien mortgage banks led in part to the establishment of DLR, which was allowed to operate with a loan-to-value ratio of 70% of DLR's valuation of the mortgaged property.

Between its establishment in 1960 and 1 July 2000, DLR operated on its own individual legal basis pursuant to the DLR Act. DLR's exclusive right to grant loans based on an LTV ratio of 45-70% was abandoned from 1 January 1999. It became subject to the Mortgage Credit Act as of 1 July 2000 and in 2001 it became a company limited by shares.

Shares in DLR are held by 58 local and regional banks and savings banks. DLR does not disclose a detailed owner structure, but as of Q4 19 member banks of Lokale pengeinstituter (The Association of Local Banks in Denmark, Savings Banks and Cooperative Banks in Denmark) owned 48% and member banks of Landsdækkende Banker (National Banks) owned 21%, PRAS 8%. Other financial institutions owned 23% (DLR owns 9% of its own shares).

DLR's market share was 5.5% as of June 2020. For DLR's main lending areas (agriculture, office and business properties, private rental housing properties and private co-operative housing properties), the market share was 16.3%. As well as providing mortgage loans, DLR has managed the loan portfolio of LR Realkredit since 1994. This agreement was cancelled in 2019 with effect from 2022 following Nykredit's take-over of LR Realkredit. DLR takes no credit risk on this portfolio.

DLR has an 'A-' issuer rating from Standard & Poor's and an 'AAA' covered bond rating (capital centre B and general capital centre).

Table 35. Ratings (M/S/F)

Covered bond rating:	WR/AAA/-
Issuer rating:	WR/A-/-

Source: Moody's, Standard & Poor's, Fitch, Danske Bank

Table 36. Financial info

DKKm	2019	2018
Net interest income	3,142	3,124
Fees and commissions	-641	-540
Investment portfolio	-171	-211
Pre-provision income	1,171	881
Loan impair. charges	-86	24
Operating profit	1.085	905
Cost/income ratio	22.2%	23.8%
Total capital ratio	17.1%	16.9%
Tier 1 capital ratio	15.5%	16.0%
Arrears rate	0.48%	0.92%
Repossessed properties	7	10

Source: DLR Kredit, Danske Bank

Table 37. More info

Bond ticker	DLRKRE
Website	www.dlr.dk

Source: DLR and Danske Bank

Financial performance

DLR Kredit A/S reported a 2019 operating profit of DKK1.1bn – an increase from DKK905m in 2018. Net interest income was roughly unchanged, but DLR posted a 10-year high growth in new lending at 5.6% and lending growth was especially high among private rental. At the same time loan impairment charges provided an income of DKK86m due to an improved outlook for especially pig farmers. The tier 1 capital ratio decreased slightly due to higher REA following the high loan growth, but the total capital ratio increased as DLR issued DKK1.3bn of tier 2 capital in 2019. DLR's target for CET1 (equal to tier 1 as DLR has no AT1 outstanding) is 13.5% and the total capital ratio target is 17%.

Business model and funding profile

DLR is a specialist mortgage bank subject to supervision by the Danish FSA. It provides mortgages through the branch networks of its shareholder banks. In order to support the customer advisory services of the banks in connection with mortgage loans, DLR has developed an electronic communications system – DLRxperten. DLR has no branches itself.

DLR offers only mortgages secured on properties in Denmark. It focuses on mortgages on agricultural and commercial properties as well as co-operative homes, rental homes and publicly subsidised housing projects. The share of lending to agricultural properties has been falling during the past years and made of 57% as of Q4 '19. The bank offers interest-reset loans (35%), fixed-rate callable loans (28%) and floating-rate loans (36%). All mortgages are based on the pass-through principle, meaning that consumers have a delivery option on underlying bonds.

DLR implemented a new uniform loss guarantee concept for all new lending as of 1 January 2015. This means that realised losses on mortgages are partly carried by the loan distributing partner banks in three stages: (1) a 6% guarantee covering the entire notional of the loan for which the distributing banks receive a guarantee provision, (2) offsetting guarantee provisions paid to the distributing bank potentially over 10 years and (3) a portfolio guarantee covering each distributing bank's loss guarantee on which DLR can draw if the losses incurred are not covered by (1) or (2). Additional guarantees are required for loans secured by risky collateral such as power plants, hotels etc. Consider for example a loan with a remaining notional of 50 being designated as non-performing with a recovery of 40. In this case the distributing bank covers 6% of the remaining notional – i.e. 3. Furthermore, following (2), DLR can offset the remaining loss of 7 in expected guarantee provisions over the following 10 years to the distributing bank. In case (1) and (2) do not cover the entire loss DLR can draw on the provided portfolio guarantee. DLR carries all losses not covered by the guarantees. Of total lending 72% was covered by the uniform guarantee concept as of Q4 19. This share will increase as loans covered by the old concept are redeemed.

Mortgage-backed covered bonds issued by DLR are divided into different cover registers (capital centres). According to the revised Mortgage Act, any new SDOs must be issued out of separate capital centres. By the end of 2007, DLR had closed and subsequently grandfathered the existing series in General Capital Centre, according to the CRD, with new SDOs issued out of capital centre B.

Table 38. Cover pool info – Capital Centre B

DLR Kredit	DKK 179bn
JCBs/SNP	DKK 8bn
WA indexed LTV	
Over-collateralisation	9.7%
Fixed-rate loans	60%
Interest-only loans	37%
Geography	DK
- Metropolitan area	5%
- Other Zealand	14%
- Northern region	22%
- Eastern Jutland	31%
- Southern region	27%
Asset type	
- Residential	14%
- Private rental	17%
- Agriculture	56%

Source: Cover pool report Q1 '20 from DLR.

Cover pool and asset quality

As of Q1 20, DLR's Capital Centre B totalled DKK179bn and consisted mainly of Danish-based assets, distributed as 61% in agricultural assets and 19% in commercial assets.

DLR's cover pool consists primarily of agriculture exposures, although this share has fallen in recent years. DLR is among the more diversified mortgage banks geographically and holds a large share of mortgages with exposures to Jutland and Funen (80%).

Danmarks Skibskredit (ship finance)

Company profile

Danmarks Skibskredit A/S (Danish Ship Finance [DSF]) was established in 1961 to provide financing to the Danish shipping industry. DSF is based in Copenhagen and operates as a ship finance institute under a dedicated legal framework (the Act on a ship finance institute and the Executive order on a ship finance institute). The Act on a ship finance institute confines the lending activities conducted by a ship finance institute to ship mortgage lending only. DSF is supervised by the Danish FSA.

Since late 2016, DSF has been owned by a consortium of private equity fund Axcel and pension funds PFA and PKA. The three entities hold equal shares of 98% of the equity in Danmarks Skibskredit Holding A/S, which owns 87% of the shares in DSF. The remaining shares in DSF are held mainly by The Danish Maritime Fund, a trust established to promote Danish shipping- and shipbuilding industries.

DSF's lending is based on first-lien ship mortgages and, to a limited extent, ship owners' payments of instalments to shipyards for vessels under construction. DSF's clients include Danish as well as select international shipping companies.

DSF has a 'BBB+' issuer rating from S&P and an 'A' covered bond rating both with a 'stable' outlook. The latter incorporates an uplift of two notches over the issuer rating reflecting resolution regime uplift and 'moderate' systemic importance (one notch each). However, S&P does not assign collateral-based uplift, as replacement language for counterparties (bank account provider, swap providers) is not in place. The outlook on both the issuer rating and the covered bond rating was revised to 'stable' from 'negative' in 2019 due to a low amount of non-performing loans and a robust capitalisation. DSF also has an unsolicited standalone issuer rating of Baa3 from Moody's and Baa2 rating of the covered bonds issued (both with 'stable' outlooks).

Table 39. Ratings (M/S/F)

Covered bond rating:	Baa2*)/A/-
Issuer rating:	Baa3*)/BBB+/-

** Unsolicited rating*
Source: Moody's, Standard & Poor's, Fitch, Danske Bank

Table 40. Financial info

DKKm	2019	2018
Net interest income	516	477
Fees and commissions	27	32
Investment portfolio	-79	66
Pre-provision income	298	308
Loan impair. charges	-2	35
Operating profit	296	343
Cost/income ratio	35.5%	19.1%
Total capital ratio	18.5%	19.0%
Tier 1 capital ratio	18.5%	19.0%
Net write-offs	1.2%	0.6%
Net NPL ratio	6.3%	8.4%

Source: DSF, Danske Bank

Table 41. More info

Bond ticker	DANSKB
Website	www.shipfinance.dk

Source: DSF, Danske Bank

Financial performance

In 2019, Danmarks Skibskredit enjoyed another year of decent lending growth of 5%. Gross lending thus increased to DKK41bn (collateralised by 774 vessels) leading to an increase in net interest income from lending to DKK516m. However, this was on the back of a low starting point in 2018, when a lower average loan balance during the year meant net interest rate income was at its lowest in five years. Loan impairment charges were negative driven by the gradual improvement of credit quality among borrowers following the high default levels among especially dry bulk and offshore in 2016. The investment portfolio did not fare well in 2019, due largely to a weak performance among high-coupon Danish callable bonds because of large prepayments.

Net write-offs during the year were at the highest level over the past 20 years at DKK485m, corresponding to 1.2% of the loan book but well within the loss allowance account standing at DKK2bn (4.9% of the loan book). The majority of write-offs stemmed from existing non-performing exposures towards offshore.

Business model and funding profile

DSF is a specialist ship mortgage bank and adheres to the specific balance principle. Given Danish covered bond legislation, DSF is, like the other specialist mortgage banks, entirely wholesale funded.

DSF issues mainly DKK-denominated ship mortgage bonds ('Skibskreditobligationer', SMBs) in the domestic market. As lending is predominantly in USD, DSF uses cross-currency basis swaps to swap the proceeds raised through wholesale debt issues, mainly to USD floating rate.

SMBs can be issued to finance loans with LTV up to 70% and meet the requirements stipulated in UCITS Article 52(4). However, SMBs do not comply with CRD, as the latter requires the underlying ship mortgages serving as collateral to comply with a 60% LTV limit at all times. Nonetheless, SMBs issued before 2008 are grandfathered. DSF issues SMBs out of the General Capital Centre. Loans exceeding 70% of the value of the vessel(s) may be provided subject to an additional capital charge in the form of a deduction from own funds in the calculation of the total capital ratio.

DSF is also authorised to issue SDOs. As SMBs and SDOs cannot be issued out of the same capital centre, DSF issues SDOs out of Capital Centre A. Ship mortgages serving as collateral for SDOs must at all times comply with a 60% LTV limit – if this level is exceeded, supplementary collateral must be provided. Capital Centre A was opened in March 2019 for the purpose of issuing DSF's EUR denominated SDOs targeted a European investor base. DSF has been targeting a broader investor base for some time, which was completed in 2019 through two syndicated EUR deals in March and November.

Danmarks Skibskredit conducts tap issuances in DKK and EUR bonds (although no taps have been conducted in the recently issued EUR denominated bonds) and do syndicated deals in EUR. The tap issuances in DKK works differently from normal tap issuance among other Danish covered bond issuers (for more on issuance procedures see Chapter 6). Each week Danmarks Skibskredit will publish price targets for each of its bonds and whether they intend to conduct buybacks or offers in the listed ISINs. Price targets are usually communicated as a spread to matched maturity swaps or non-callable bullets issued by the other specialist mortgage banks and will be updated throughout the week if spreads move significantly. No weekly funding target is communicated. Subsequently, during the week investors can contact Danmarks Skibskredit for an offer of a specific amount (in practice trading takes place through the larger Danish investment banks). The amounts for sale can vary during the year but it is possible to do fairly large size.

Cover pool and asset quality

DSF's General Capital Centre stood at DKK45bn as of Q1 20, of which DKK38bn was loans secured on vessels with the remaining DKK7bn being substitute assets all of which were central bank eligible. Of the cover assets, 85% were USD denominated followed by DKK and EUR. The 10 largest exposures made up 49% of the cover pool and 76% of the outstanding loans had an LTV below 40%. Covered bonds issued out of this capital centre are all DKK denominated.

DSF's Capital Centre A stood at DKK9bn as of Q1 20, of which DKK7.4bn was loans secured on vessels, with the remaining DKK1.6bn being substitute assets, all of which were central bank eligible. Of the cover assets, 90% were USD denominated followed by NOK and EUR. The 10 largest exposures made up 77% of the cover pool and 75% of outstanding loans had a LTV below 40%. Covered bonds issued out of this capital centre are all EUR denominated.

Loans in both capital centres are in general amortising floating rate loans.

Table 42. Cover pool info – General Capita Centre

General CC	DKK45bn
JCBs/SNP	DKK0bn
WA Indexed LTV	51% LTV
Over-collateralisation	18.4%
Interest-only mortgages	2%
Fixed-rate loans	14%
Geography	DK, NO, GR
- Denmark	34%
- Norway	15%
- Greece	12%
- Germany	11%
- United Kingdom	8%
- Other area	20%
Asset type	
- Ships*)	100%

** Excluding substitute assets*
Source: ECBC template Q1 20 from Danmarks Skibskredit

Table 43. Cover pool info – Capital Centre A

Capital Centre A	DKK9bn
JCB/SNP	DKK0bn
WA Indexed LTV	50%
Over-collateralisation	22.9%
Interest-only mortgages	3%
Fixed-rate loans	4%
Geography	DK, NO, GR
- Denmark	30%
- Norway	18%
- Greece	18%
- United Kingdom	15%
- Germany	13%
- Other area	6%
Asset type	
- Ships*)	100%

** Excluding substitute assets*
Source: ECBC template Q1 '20 from Danmarks Skibskredit

4. Ratings

The Danish covered bond legislative framework is recognised as among the strongest in the world. In particular, the almost non-existent market risk, eliminated by the balance principle, is a major advantage for traditional Danish covered bonds.

Ratings include capital centres and classification

Danish mortgage banks have a number of different capital centres and the covered bond ratings from S&P, Fitch and Moody's are by capital centre and classification (RO/SDO/SDRO/JCB(SSB)). For example, Realkredit Danmark's SDRO covered bonds issued out of Capital Centre S are rated 'AAA' by S&P and Fitch, while the SDRO bonds in Capital Centre T are rated 'AAA' by S&P and 'AA+' by Fitch. Realkredit Danmark's Section 15 senior debt (junior covered bonds), issued out of capital centres S and T, is rated 'AA-' by S&P.

Ratings by Standard & Poor's (S&P)

All the major Danish mortgage banks, such as Realkredit Danmark, Nykredit, Nordea Kredit, Jyske Realkredit and DLR Kredit, have 'AAA' ratings with 'Stable outlook' on the most traded capital centres. According to S&P's rating methodology, Danish covered bonds have a systemic importance and a jurisdictional support assessment of 'Very Strong'.

Danish mortgage institutions are exempt from the Bank Recovery and Resolution Directive (BRRD) due to their non-deposit taking nature but are still required to maintain a debt buffer equivalent to 2% of their unweighted loans. For more information on the debt buffer, see Chapter 2. S&P removed all uplift from government support in its ratings of Danish banks in July 2015, following the implementation of BRRD in Denmark. This meant it removed two notches of uplift for Nykredit, placing the issuer rating on 'Negative outlook'. Instead of lowering the rating from 'A+' to 'A-', S&P kept the rating on 'A' due to a one-notch uplift from additional loss absorbing capital (ALAC) based on the assumption that Nykredit would defend this uplift by issuing around EUR2-3bn of new ALAC-compliant debt. S&P put the rating on negative outlook, as Nykredit was required to have this in place in 2017 at the latest. Nykredit successfully issued a total of EUR1bn of senior resolution notes in 2016 (EUR500m in May 2016 and EUR500m in July 2016) and EUR800m of Tier-2 debt in November 2015. As a result, S&P changed the outlook for the Nykredit issuer rating to 'Stable outlook' on 8 July 2016. Nykredit issued additional EUR0.8bn of senior resolution notes in 2017 (EUR500m in March 2017 and EUR300m in June 2017) and a further EUR2bn of senior non-preferred debt (SNP) in 2018, 2019 and 2020 such that the total outstanding currently is EUR 5bn. In November 2019 S&P upgraded Nykredit's issuer rating to 'A+' and 'stable outlook' following the rapid build-up of additional loss-absorbing capital. Nykredit expected in the beginning of 2020 to issue SNP debt worth EUR 3bn in order to comply with subordination requirements being fully phased in on 1 January 2022. However, in May 2020 the Danish FSA de facto moved forward the implementation date of BRRD II effectively lowering the subordination requirement for Danish banks and thus also the need for SNP issuance in 2020. Thus, Nykredit instead will focus on senior unsecured debt issuance in 2020.

As was the case with Nykredit, DLR Kredit was also put on 'negative' outlook in 2015 due to the implementation of BRRD reflecting the possibility that S&P might remove one notch of uplift from government support. DLR Kredit has also issued senior resolution notes starting in 2017 pursuant to the debt buffer requirement. In June 2017, DLR Kredit issued EUR1bn in a DKK-denominated bond and projected a senior resolution notes issuance need of DKK3-4bn in the coming two to three years as the debt buffer requirement for DLR would come to reach c. DKK3bn in 2020.

DLR's issuer credit rating was increased to 'A-' in May 2017 by S&P due to additional ALAC uplift of +1 due to the planned issuance of senior resolution notes. At the end of 2019 DLR had issued DKK 4bn worth of senior resolution notes/senior non-preferred debt and did not plan any immediate issuance in the segment. DLR's issuance of Senior Secured Bonds (JCBs) is as of October 2017 no longer covered by a rating. In October 2019 the outlook on DLR's issuer credit rating was lowered from 'positive' to 'stable' by S&P mostly due to sector trends.

S&P put the outlook for Realkredit Danmark's JCB programme on 'negative' in October 2018 following a similar action two month earlier regarding the outlook of Danske Bank's senior unsecured debt issuances due to the at the time ongoing money laundering case. As of June 2020 RD has DKK 4bn loan from its parent group outstanding with the loan being used primarily to comply with over-collateralisation requirements in capital centre T. In December 2019 S&P confirmed the rating and outlook of capital centre S as 'AAA' and 'stable outlook'.

The last rating update by S&P for Nordea Kredit took place in December 2017, when its rating of capital centre 2 was kept unchanged at 'AAA' with a 'stable' outlook.

Table 44. Ratings by Standard & Poor's

Capital centre	Classification	Rating (ICR/ covered bond)	Outlook	WAFF	WALS	Target CE	Actual CE	Unused notches of uplift
Realkredit Danmark		A	Stable outlook					
Capital Centre S	SDRO	AAA	Stable outlook	15.78%	31.18%	6.66%	7.27%	3 notches
Capital Centre S	JCB	AA-	Neg. outlook					
General Capital Centre	Grand RO	AAA	Stable outlook	17.17%	30.05%	9.32%	10.60%	3 notches
Capital Centre T	SDRO	AAA	Stable outlook	18.47%	34.08%	4.89%	8.47%	3 notches
Capital Centre T	JCB	AA-	Neg. outlook					
Capital Centre A	SDRO	N/A	N/A					
Danske Bank		A	Stable outlook					
Register C	SDO	AAA	Stable outlook	24.78%	44.66%	21.78%	18.26%	1 notches
Register D	SDO	AAA	Stable outlook	11.07%	52.79%	8.2%	8.9%	3 notches
Register I	SDO	AAA	Stable outlook	13.9%	44.5%	22.21%	16.86%	1 notches
Nykredit Realkredit		A+	Stable outlook					
Capital Centre C	Grand RO	AAA	Stable outlook	15.86%	9.12%	6.12%	6.75%	3 notches
Capital Centre D	Grand RO/ New RO	AAA	Stable outlook	24.83%	37.66%	9.38%	10.37%	3 notches
Capital Centre D	JCB	AA-	Pos. outlook					
Capital Centre E	SDO	AAA	Stable outlook	14.48%	28.99%	3.88%	3.35%	3 notches
Capital Centre G	New RO	AAA	Stable outlook	27.35%	92.10%	26.88%	22.48%	1 notches
Capital Centre H	SDO	AAA	Stable outlook	18.36%	31.93%	4.50%	4.34%	3 notches
Capital Centre H	JCB	AA	Stable outlook					
Capital Centre I	New RO	AAA	Stable outlook	21.18%	86.58%	21.17%	30.45%	3 notches
Capital Centre J	SDO	N/A	N/A					
General Capital Centre	Grand RO	AAA	Stable outlook	18.26%	24.65%	11.28%		3 notches
Totalkredit CC C	Grand RO	AAA	Stable outlook	11.56%	9.90%	2.95%	31.84%	3 notches
Nordea Kredit		AA-	Stable outlook					
Capital Centre 1	Grand RO	AAA	Stable outlook	18.57%	30.23%	13.78%	58.95%	4 notches
Capital Centre 2	SDRO	AAA	Stable outlook	18.21%	36.18%	6.52%	15.14%	4 notches
Jyske Realkredit		A	Stable outlook					
Capital Centre B	Grand/New RO	AAA	Stable outlook	25.21%	43.79%	16.48%	17.55%	2 notches
Capital Centre E	SDO	AAA	Stable outlook	16.16%	35.03%	4.28%	5.89%	2 notches
General Capital Centre	Grand RO	AAA	Stable outlook	17.23%	44.03%	8.54%	10.00%	3 notches
DLR Kredit A/S		A-	Stable outlook					
Capital centre B	SDO	AAA	Stable outlook	29.11%	54.66%	16.57%	18.30%	2 notches
Capital centre B	JCB	N/A	N/A					
General Capital Centre	Grand RO	AAA	Stable Outlook	32.96%	39.12%	13.02%	13.00%	1 notch
Danmarks Skibskredit		BBB+	Stable outlook					
Capital Centre A	SDO	A	Stable outlook	-	-	-	-	0 notches
General Capital Centre	SMB	A	Stable outlook	-	-	-	-	0 notches

Grand. RO: Grandfathered RO bonds issued before 2008; New RO: RO bonds issued after 2007; SMB: Ship Mortgage Bond.
Source: Standard & Poor's, Danske Bank

The issuer credit rating of Jyske Bank was raised to 'A' from 'A-' in October 2019 due to an increased ALAC-buffer providing meaningful protection to senior creditors in a resolution scenario. In August 2019 the rating on capital centre E was confirmed at 'AAA' with 'stable' outlook.

Danmarks Skibskredit's issuer and covered bond rating were revised from 'negative' to 'stable' in 2019.

WAFF: weighted-average foreclosure frequency

S&P defines the WAFF as the weighted-average foreclosure frequency. The foreclosure frequency is a loan's probability of default leading to foreclosure. The estimated foreclosure frequency is a function of borrower and loan characteristics as well as the economic stress scenario commensurate with a certain rating level.

WALS: weighted-average loss severity

WALS is the weighted-average loss severity. The loss severity quantifies the loss realised as a result of foreclosure. The expected loss is predicated on assumptions about the potential decline in the market value of collateral that may secure the asset, as well as the expenses incurred in foreclosing on and reselling the property, considering an economic stress scenario, commensurate typically with a certain rating level. The WALS is generally higher in Denmark than the average for the rest of Europe, which is because of a high share of commercial lending. However, the WAFF is comfortably lower than the European average.

CE: credit enhancement

Target credit enhancement (target CE) is the amount of over-collateralisation (OC) that is commensurate with the maximum collateral-based uplift.

Ratings by Fitch

Currently, the only Danish covered bonds rated by Fitch are those issued by Danske Bank and Realkredit Danmark. Danske Bank's covered bonds issued out of register C, D and I are rated 'AAA'. Realkredit Danmark's covered bonds in capital centres S and T are rated 'AAA' and 'AA+', respectively. The reason for RD's capital centre T being 'AA+' is due to the higher 'AAA' break-even OC of 7.0% (compared to capital centre S of 3.7%), stemming from a large share of ARMs and commercial loans. However, Fitch, in its recent rating announcement recognises a 'stable' portfolio composition and good residential asset performance.

In June 2020 Danske Bank's and Realkredit Danmark's issuer ratings were confirmed at 'A' with a continued 'negative' outlook for Danske Bank, but an increase from 'negative' to 'stable' outlook for RD. For Danske Bank the 'negative' outlook reflects COVID-19 downside risks, whereas RD's 'stable' outlook is attributed to the strong asset quality.

Table 45. Ratings by Fitch

Capital centre	IDR	Outlook	IDR uplift	PCU uplift	Recovery uplift	upon OC	Relied B/E OC	Credit loss	Cushion against IDR downgrade
Danske Bank	A	Negative							
Register D	AAA	Stable	2	5	1	8.8%	4.0%	3.3%	3
Register I	AAA	Stable	2	5	1	18.5%	10.0%	3.3%	3
Register C	AAA	Stable	2	5	2	21.0%	17.0%	15.6%	4
Realkredit Danmark	A	Stable							
Capital Centre S	AAA	Stable	0	6	2	6.8%	5.0%	3.7%	3
Capital Centre T	AA+	Stable	0	6	2	6.6%	6.0%	6.5%	4
Nykredit Realkredit	A	Positive							
Nordea Bank	AA-	Negative							

IDR = issuer default rating, CB = covered bond, D-Cap = discontinuity cap
Source: Fitch, Danske Bank

Nykredit Realkredit received a long-term issuer default rating of 'A' in August 2012 but covered bonds issued by Nykredit are currently not rated by Fitch. Nykredit's issuer default rating outlook was raised to 'positive' from 'stable' in June 2020 due to healthy capitalisation even in times of stress[21]. Nordea Bank has a long-term issuer default rating of 'AA-'.

The key rating drivers for Fitch when assessing covered bonds ratings are specified below[22].

Issuer Risk Present (IPR). Covered bond ratings are primarily driven by the long-term issuer default rating (IDR) of the issuing entity. However, an IDR uplift of up to two notches can be assigned to programmes in jurisdictions with resolution frameworks where bonds or secured debt are exempt from bail-in (as is the case in Denmark). This applies in jurisdictions where Fitch believes payments on covered bonds will continue to be made even if the issuer has defaulted on its senior debt.

Payment Continuity Assessment (PCU). Payments must be made in a timely manner despite asset/liability mismatches and thus the issuer must have a strong liquidity position. The PCU is expressed in notches above the IDR and, adjusted for the IDR uplift, from zero to eight.

Credit for Recoveries Given Default (CRGD). If the outstanding covered bonds default Fitch assumes expected recoveries based on a tested PD rating basis. Up to two notches of uplift can be generated.

OC Protection. The main source of credit enhancement and can be expressed as an asset percentage (AP). Fitch determines the level of OC or AP and compares that with a break-even OC or AP for a given rating. Depends on CRGD and PCI.

Asset Stresses (AS). The credit risk of cover pools is analysed and stressed in line with asset-specific covered bond criteria.

Cash Flow Stresses (CFS). A cash-flow model depending on NPV calculations determines the level of OC that supports timely payments in a given scenario. Stresses include prepayments, changes to refinancing spread levels, fees and changes in interest and exchange rates.

The covered bond rating can exceed the IDR of the issuer and the total number of uplifts correspond to the sum of the IDR uplift, PCU and the recovery uplift (RU).

The rating of a cover pool is broken down into two steps: (1) determining the maximum achievable rating and (2) asset and cash-flow stress-testing and OC.

(1) Consists of determining the IDR and subsequently the IDR uplift. The IDR uplift can as mentioned be up to two notches if covered bonds are exempt from bail-in. The exact determination of the number of notches depends on the amount of junior debt outstanding or other buffers available at a holding company level and whether the IDR of a potential parent is dependent is support-driven. Zero notches are attached to specialised mortgage lenders that form part of a broader banking group and are not operationally integrated with the parent.

[21] Forenet Kredit, owning 78.9% of the shared in Nykredit A/S, has committed DKK9bn (corresponding to 3% of REA), whereas the capital commitment from the pension funds, owning 19% of the shares, have committed DKK7.5bn (corresponding to 2% of REA) of recapitalisation funds.
[22] See Covered Bonds Rating Criteria – Fitch (2019).

The uplift from PCU depends mainly on the issuer's liquidity unless other risks constitute a larger threat to payment uncertainty. The standard amount of PCU notches of uplift is 8 if the programme is a pure pass-through. Note that not all PCU notches are always used in the rating analysis.

Lastly, regarding the recovery uplift this can generate up to two notches if the tested rating on a PD basis is investment grade. Not all notches of recovery uplift are always used. Fitch regards cover pools collateralised by mortgage loans as being able to secure at least one notch of uplift. However, the recovery uplift is limited to one notch if Fitch identifies material downside risk to recovery expectations for example due to FX risk. This could apply even to some hedged programmes. Again not all recovery notches of uplift is always used.

(2) Consists of cash-flow modelling, ALM losses, credit losses, recovery given default and break-even OC or AP for the rating.

The cash-flow model is used to determine the level of OC that supports timely payment in a given stress scenario. It assumes that the cover pool becomes static under the case of a third party starting from a simulated date. The model assumes that no further issuance is made.

The ALM loss measure relies on two main aspects: the first addresses the impact of interest-rate and FX movements on the NPV of assets and liabilities (NPV difference). The second (loss on sales and reinvestment loss) addresses the impact of maturity mismatches between the cover assets and the liabilities.

Expected credit losses are modelled with parameters depending on the nature and geographical location of the underlying assets or obligors. The credit loss is the percentage equalising the outstanding covered bonds with the cover pool net of stressed losses under the assumption of an OC of 0%.

The OC protection is the OC that can be relied upon as compared with the break-even OC, which Fitch determines. The level of OC that can be relied on depends on legally enforceable OC requirements and any targeted OC levels that the issuer has published.

Ratings from Moody's

Moody's was the first ratings agency to rate a Danish mortgage bank more than a decade ago. However, over the past couple of years a large number of Danish mortgage banks have ended their collaboration with Moody's following a general reassessment of the Danish banking system, which led to a range of ratings actions. In addition to taking action on current ratings and rating outlooks, Moody's raised its current over-collateralisation requirements for the various mortgage banks. The many increases in over-collateralisation requirements, which could lead to current ratings being downgraded, caused investor jitters, and following the Timely Payment Indicator (TPI) revision in 2011, some Danish mortgage banks decided to end the collaboration with Moody's.

The majority of Danish mortgage banks (Realkredit Danmark (RD), Nykredit/ Totalkredit, Jyske Realkredit, Nordea Kredit and DLR Kredit) and Danske Bank have terminated their collaborations with Moody's and Moody's has withdrawn its covered bond ratings. However, Danske Bank still has an issuer rating from Moody's and Moody's has maintained the issuer rating on Nykredit. This is an unsolicited rating determined by Moody's without access to Nykredit's management or organisation in general.

Moody's changed the outlook for the Danish banking system to negative in June 2020 following the COVID-19 crisis also affecting the outlook for Danske Bank's issuer rating.

Nordea Kredit solicited the rating of Moody's until 1 April 2020 after which the ratings of capital centres 1 and 2 were withdrawn in June 2020 by Moody's.

Danmarks Skibskredit, no longer solicits ratings from Moody's as of February 2016.

TPI leeway and collateral score

TPI leeway determines how far an issuer's rating can be downgraded without affecting the covered bond rating. The collateral score is Moody's opinion of how much credit enhancement is needed to protect against the credit deterioration of assets in a cover pool in order to reach a theoretical 'Aaa' based on expected loss, assuming those assets are otherwise unsupported. The higher the credit quality of the cover pool, the lower the collateral score.

Table 46. Ratings by Moody's Investor Service

Capital centre	Classification	Rating (Issuer/covered bond)	Outlook	TPI	TPI leeway	Collateral score	Current OC	OC level necessary to maintain current rating
Danske Bank		A3	Neg. outlook					
Nykredit		A3	Stable outlook					
Danmarks Skibskredit		Baa3/Baa2						

Source: Moody's, Danske Bank

Moody's (like S&P and Fitch) has also amended its rating criteria following the agreement on the draft EU directive in spring 2014 on bank resolution, so that it now takes into account that covered bonds are exempt from bail-in, while senior unsecured debt is not; thus putting covered bonds at a relative advantage to senior unsecured bonds, which Moody's deems should also be reflected in its ratings. The most significant change in the rating methodology is how the anchor for the covered bond rating process is now determined. Moody's refers to the covered bond anchor as '*the probability of a covered bond anchor event occurring. A covered bond anchor event occurs when the issuer, or another entity in the issuer group that supports the issuer, ceases to service the debt obligations under the covered bonds'*.

5. Bond types

Bonds are issued against mortgages on residential, commercial and public property

Danish covered bonds are secured by mortgages on residential, commercial and public property. Persistent demand in Denmark for mortgage finance has rendered the Danish covered bond market among the largest in the world and mortgage finance has to some degree lowered the need for corporate bond issuance. As of January 2020, the volume of Danish covered bonds (denominated in DKK and EUR) issued by specialist mortgage banks stood at DKK2,889bn (EUR387bn).

Table 47. Volume of Danish bonds (DKKbn)

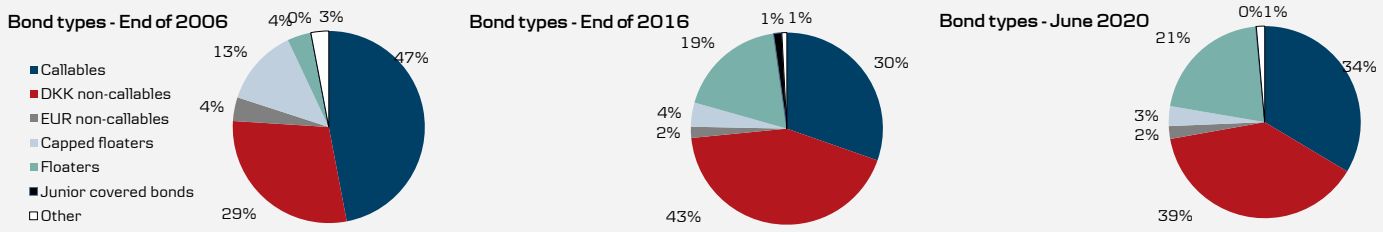
	Jan. 2017	Jan. 2018	Jan. 2019	Jan. 2020	Jan. 2017
Government bonds	617.9	618.4	597.0	601.0	617.9
T-bills	33.7	38.4	44.3	24.5	33.7
Mortgage bonds	2,605	2,696	2,772	2,889	2,778.8
- Callable annuities	856.3	918.6	980.150	1,114.7	2,778.8
- Non-callable bullets*)	1,124.3	1,110.0	1,115.4	1,115.2	2,778.8
- Floaters*)	504.8	569.1	591.8	581.8	2,778.8
- Capped floaters	119.5	98.1	84.4	76.8	
Total	**3,257**	**3,353**	**3,413**	**3,514**	**3,582.9**

** Only DKK. Limited amounts in EUR*
Note: Not including government guaranteed bonds
Source: Danmarks Nationalbank, Danske Bank

Innovation in recent years

The covered bond market in Denmark has experienced a rapid and profound transition over the past decade. Traditionally, callable annuity bonds dominated, mirroring the dominance of callable fixed rate mortgage loans in the Danish property market. Non-callable bullet bonds were introduced to fund interest-reset loans, which were launched in 1996. Since then, a sustained demand for interest-reset loans has shifted the Danish covered bond market to such an extent that non-callable bullet bonds as at the end of 2016 made up almost 43% of total market volume (see Chart 1 below) and as of June 2020 around 39%.

Chart 14. Volume of Danish bonds



Source: Danske Bank

The mortgage banks introduced a line of products in 2004 that were funded by issuing capped floaters or floating-to-fixed covered bonds. In 2005, FLTs without a cap were introduced, targeting corporate clients, and in 2007 FLTs with a ratchet coupon ('RenteDyk') were launched.

Today, floating-to-fixed bonds and 'RenteDyk' are no longer issued by the mortgage banks and the outstanding amount on the existing series is limited. Also, the issuance of capped floater bonds has decreased in recent years and currently only Nykredit and Jyske Bank offers capped floating rate loans (note that Jyske Bank funds capped floating rate loans through Jyske Realkredit's issuance of non-capped floaters). Instead the issuance of floating rate covered bonds (FLTs without a cap) has increased in recent years and made up 4% of the market in 2006, 19% in 2016 and 21% in 2020 largely at the expense of non-callable bullet bonds. This mirrors the mortgage banks' efforts to decrease refinancing risks following the introduction of the supervisory diamond in 2014 as well as increased focus from rating agencies.

Also, the share of callable annuities has in general been increasing the past years following new legislation (supervisory diamond, limited loan choices for risky borrowers etc.) and flat yield curves making it fairly cheap to pay a fixed rate as compared to a variable one, again at the expense of non-callable bullets.

Table 48. Bond structures

	Callable annuity bonds	Non-callable bullet bonds	Floaters/capped floaters
Interest payments	Quarterly	Annual	Quarterly
Repayment	Annuity or interest only	Bullet	Annuity or interest only
Coupon	Fixed	Fixed	Floating, capped
Currency denomination	DKK	DKK or EUR	DKK, EUR, SEK or NOK
Maturities	10, 15, 20 and 30 years	1-11 years	1-5 years*)
Issuance	Tap	Tap or auction	Tap or auction
Opening period	3 years	Closes 3M prior to maturity	Closes 2m prior to maturity

*Source: Danske Bank. *) New issuance primarily takes place in maturities no longer than 5 years.*

Callable annuity bonds

Largest part of mortgage banking market

Callable annuity bonds are unique to the Danish covered bond market. Traditionally, callable annuity bonds were the only type of bonds issued in the Danish covered bond market but the introduction of new products has expanded market diversity.

Payment dates and maturities

Originally, this type of bond had two payment dates per year but four has been the norm since 1985. Standard payment dates are 1 January, 1 April, 1 July and 1 October. Maturities are primarily 10, 15, 20 or 30 years.

Call option

Callable annuity bonds are fixed rate bonds with an embedded call option. The embedded call option enables borrowers to prepay their loan at par at each payment date during the duration of the loan.

Payment profile

Traditionally, all callable loans were issued as annuity loans (level-pay loans). Annuity loans amortise with equal payments consisting of principal and interest but the amount of principal repaid increases over time, while the amount of interest decreases. In 2003, deregulation enabled mortgage banks to offer borrowers interest-only payments for up to 10 years. Callable annuity loans with an interest-only option are funded in separate callable bond series (interest-only hybrids).

Ordinary repayments

Borrowers' interest payments and redemptions made on the payment dates are distributed to investors in accordance with the percentage of bonds drawn so that any investor's holding in a given bond series corresponds to the overall percentage of bonds drawn in that series. The amount is rounded to the nearest øre (DKK0.01) for bonds denominated in Danish kroner and euro cents for bonds denominated in euro. The amounts of bonds drawn are published on the publication date.

Pools

There is no direct link between the borrower and the investor in the sense that the investor does not buy a bond in the name of a specific person or property. The pool of borrowers in a bond series may consist of both private and corporate borrowers. The repayments at one payment date are the sum of the redemptions from all borrowers in the pool. Every month the mortgage banks publish the borrower distribution of each bond series to enable investors to predict prepayment behaviour.

Opening period

Callable bond series are open for issuance for a period of three years[23], e.g. between 1 September 2014 and 31 August 2017 all 30-year loans were financed through the issuance of bonds maturing in 2047 and all 20-year loans by bonds maturing in 2037. When the bond series with maturity 2037 and 2047 closed for issuance as of 31 August 2017, new callable fixed rate loans are issued in new bond series with maturity 2040 and 2050. On account of this opening period and the possibility of taking a loan with a shorter maturity than the bond's maturity, the actual cash flow on a bond is not equivalent to the theoretical cash flow of a callable bond. Hence, the calculation of key figures on bonds requires information about the actual cash flow. After each payment date, the mortgage banks supply these figures to the OMX Nordic Exchange.

Par rule

Mortgage banks have agreed not to offer callable loans based on bonds priced above par, referred to as the par rule, to avoid arbitrage from borrowers simultaneously disbursing a loan at a price above par and prepaying the loan at par. Note, however, that while a loan *offer* cannot be made to borrowers in a bond series trading above par, the actual disbursement and subsequent tap can happen in bond series trading above par at the time the loan is granted as loan offers can be outstanding for up to six months. If a borrower with a loan size above DKK 3M obtains a loan in a bond series trading above 100 the borrower cannot prepay for the following 12 months. The opening period of a bond series may therefore be shortened if bond prices exceed par but the bond series will be reopened for issuance if the price falls below par again.

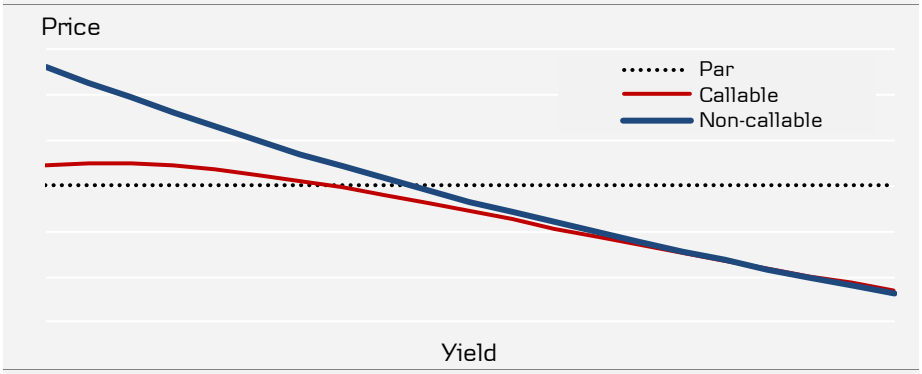
Mortgage banks generally only offer loans in series trading fairly close to but below par due to the pull-to-par effect and risk of a sudden fall in interest rates. If a loan is offered in bonds trading far below par the pull-to-par effect will over time imply that the borrower could become technically insolvent as the LTV would mechanically increase. The same would happen if interest rates were to suddenly fall massively – as the bond would effectively have a 10 to 15 year duration LTV would increase requiring the mortgage bank to fund supplementary collateral. If the bond trades close to par even markedly lower interest rates would not change the LTV by much due to the negative convexity around these price levels.

Pricing callable bonds

The traditional positively convex relationship between the level of interest rates and the prices of traditional bonds is not directly applicable to callable bonds. The reason is that a callable bond can be considered as a portfolio of a non-callable bond and a sold option to repay the bond at par. As interest rates decline and the price of the bond rises above par, the value of the option will rise (see the chart below).

[23] The opening period can in certain circumstances be shorter or longer than three years, e.g. in connection with implementation of the new Mortgage Act in July 2007, the 2038 bond series was closed early and the opening period for the 2041 series was extended to almost four years.

Chart 15. The price of a callable and non-callable bonds



Source: Danske Bank

Compared with a non-callable bond, the price is kept down when interest rates decline, as debtors are likely to start repaying the bond at par. When a bond becomes extremely exposed to prepayments, the price will fall when interest rates fall. Conversely, these bonds may offer a defensive investment alternative for investors who expect increasing interest rates.

Non-callable bullet bonds

Interest-reset loans and non-callable bullet bonds

Non-callable bullet bonds are fixed rate bonds with a single annual payment on 1 January, 1 April, 1 July or 1 October. Nykredit is currently the only Danish mortgage bank to issue non-callable bullet bonds with an annual payment on 1 July. Maturities range from one to 11 years, with emphasis on the one- to five-year segments (the share of +5 year maturities that are LCR level 1B is limited). The characteristics of the bonds mirror those of plain-vanilla Danish government bonds and most European covered bonds.

Non-callable bullet bonds were introduced to fund interest-reset loans ('FlexLån') first launched by Realkredit Danmark in 1996. Since then, sustained demand for interest-reset loans has been recorded, leading to a profound transition of the Danish covered bond market from callable issues to non-callable issues. As at end-2020, non-callable bullet bonds made up around 39% of total market volume in the Danish covered bond market.

The popularity of interest-reset loans is *inter alia* attributable to the great flexibility they offer to borrowers. The borrower may choose between more than 20 different interest-reset profiles, though all of these are funded by issuing a single range of bonds.

Payment dates and maturities

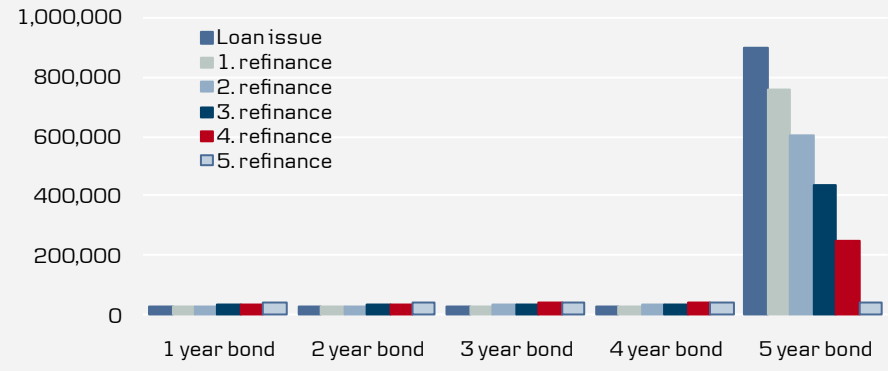
Interest-reset loans are offered as 10-, 15-, 20- or 30-year loans. The borrower can choose to make repayments on a loan four or 12 times a year. The one- to 11-year non-callable bullet bonds that fund the loans have one interest payment a year, on 1 January, 1 April, 1 July or 1 October. Each year, when the shortest bond matures, a new 11-year bond is opened.

Annuity loans based on bullet bonds

As is the case for callable bonds in Denmark, the majority of loans that are interest-reset are repaid in accordance with the ordinary annuity or annuity with an interest-only option. As the bonds funding the loans are not annuities but bullet bonds a loan is funded by (in case of match funding) issuing a portfolio of bullet bonds.

Example: In Chart 3 below the funding profile of a 5Y interest-rest profile is shown. Consider a borrower in March 2020 applying a mortgage from RD[24]. At the date of disbursement issuance is made in 5 different bond series[25]: Jan'21, Jan'22, Jan'23, Jan'24 and Jan'25 (the borrower refinances in Jan'25). At issuance the fixed cash rate paid until Jan'25 is an unknown (unless the yield curve out to 5Y is perfectly flat), which must be solved for (the mortgage banks uses an algorithm to decide this but will in principle be very close to the yield on the Jan'25 bond). The constraints in the solving routine are: (1) the funds obtained must be equal the value of the loan, (2) the notional principal on the Jan'25 bond must be such that the sum of coupon payment and repayment of principal from the mortgage bank to bond investors on 1 January 2025 equals the sum of the remaining principal on the loan and any interest rate payments and principal repayments during the preceding 12M and (3) the combined coupon and principal repayments at each payment date must equal the preceding 12-month interest rate and principal payments on the loan. Due to the shorter than 5Y cash-flow the yield level will be slightly lower than the yield on the 5Y bond. Note that the above routine must be conducted also for IO loans since the interest payments from the loan must be matched by a cash outflow.

Chart 16. Funding profile of 30Y annuity loan based on a 5Y interest-reset profile



Source: Danske Bank

Increasing issues in interest-reset loans funded by longer maturities

Since the launch of FlexLån in 1996, the most popular profile of the loans has been the loan funded by the one-year bond. As a result, this bond is the most liquid non-callable bond today. Lately, an increase in demand for loans funded by bullet bonds with longer maturities has been recorded, increasing the volume of bonds with three- and five-year maturities substantially.

Interest-reset with payment dates 1 January, 1 April, 1 July and 1 October

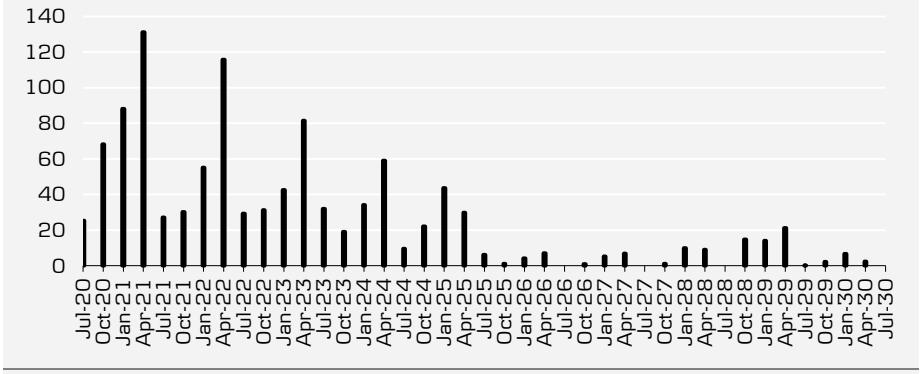
The payment date of the interest-reset loan has traditionally been 1 January, with a refinancing auction in December. However, as the outstanding amount for interest-reset loans increased quite significantly and hence the auctioned amount at the December auction, a need to limit the increasing auction size of the December auction arose. Since 2005 Nykredit has offered borrowers interest-reset loans with payment dates of 1 April and 1 October and since February 2013, Nykredit has been offering interest-reset loans with a payment date of 1 July. In 2010, Realkredit Danmark, Jyske Realkredit, Nordea Kredit, DLR and LRF started issuing non-callable bullet interest-reset covered bond series with payment dates of 1 April or 1 October.

The volume of non-callable bullet bonds split by maturity and payment date is indicated in the charts below.

[24] RD currently funds new 5Y interest-reset loans in January maturities – this was changed from April in October 2019 in order to limit the refinancing risk at a single term.
[25] The law on balance principles stipulates that the cash outflow cannot exceed the cash inflow over a 12M period (general balance principle). Thus, it is enough to consider issuance in five different bond series.

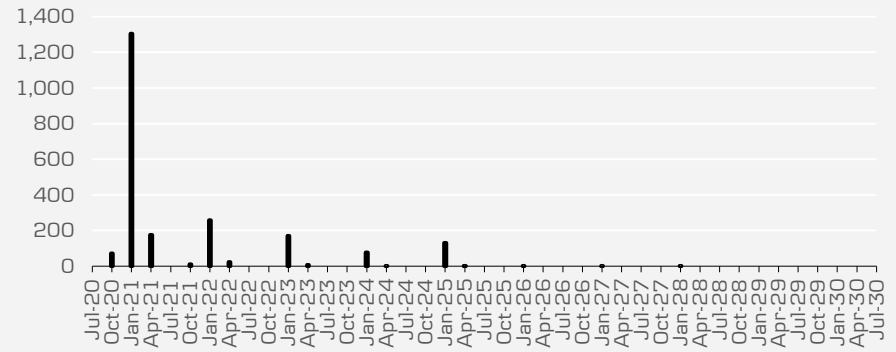
As is the case for all covered bonds in Denmark, there is no separation of the borrowers in a security code. This means that a borrower can be either a private or a commercial borrower. However, there are restrictions in Danish legislation as to which maturity and repayment profiles can be offered in the various segments (see Chapter 2).

Chart 17. Volume of DKK non-callables June-2020 (DKKbn)



Source: Danske Bank

Chart 18. Volume of EUR non-callables June-2020 (EURm)



Source: Danske Bank

The mortgage banks aim to keep the bond series that fund the interest-reset loans open throughout their maturity.

Refinancing maturing bonds at auction

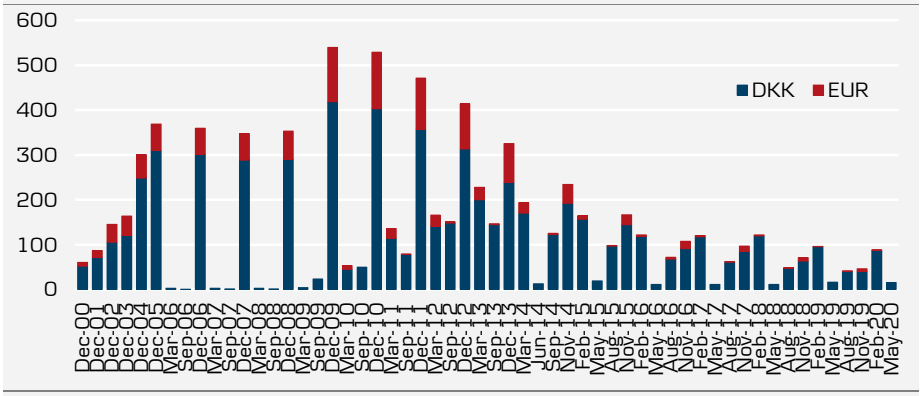
Non-callable bullet bonds are issued on tap throughout the maturity to match loan origination. Bonds maturing on 1 January, 1 April, 1 July and 1 October are refinanced by new bond issues sold at auctions in November, February, May and August, respectively[26]. Due to the success of interest-reset loans, refinancing auctions have grown into one of the most liquid-issuing activities in European covered bond markets.

The auctions take place at OMX Nordic Exchange's mortgage-issuing sub-market. The Dutch auction principle and hidden call method are used. Under the Dutch auction principle, all bids above the cut-off price are settled in full at the cut-off price. For bids at the exact cut-off price, proportional allocation is used. All bids below the cut-off price are not settled. Hidden call means the bidders can see only their own bids, while the issuer can see all bids.

The total volume of the refinancing auctions is indicated in the chart below.

[26] Due to the LCR requirement the bonds are auctioned more than 30 days before the funds are needed. The bonds sold are settled on the date of maturity of the maturing bonds.

Chart 19. Auction volume of non-callable bullet bonds (EURbn)



Source: Danske Bank.

New mortgage act on non-callable bullet bonds as of 1 April 2014

A new mortgage act was passed as of 1 April 2014, aiming at reducing refinancing risk for borrowers. Under the new law, loans where the underlying bonds are issued with a maturity of up to two years risk the maturity of the underlying bonds being extended if (1) the yield level increases by more than 500bp at a refinancing auction or (2) the mortgage bank is unable to sell its bonds at a refinancing auction (failed auction trigger). Since 1 January 2015, the failed auction trigger has also applied to loans where the underlying bonds are issued with a maturity of more than two years. Read more about the new legislation under 'New legislation addressing refinancing risk' in Chapter 2.

Non-callable bullet bonds denominated in euro

At the commencement of the euro, the Danish mortgage banks launched a euro programme to fund EUR-denominated interest-reset loans. The euro programme was launched on equal terms with DKK-denominated non-callable bullet bonds. Hence, EUR-denominated covered bonds are non-callable fixed rate bullets with maturities from one to 11 years and a single annual payment due on 1 January, 1 April or 1 October.

Demand for EUR-denominated interest-reset loans has been driven mainly by the Danish kroner versus euro yield spread, which is currently low and thus the demand and subsequent issuance is low.

Government guaranteed non-callable bullets

In November 2017, the law on the financing of government subsidised social housing loans was changed. Subsidised social housing loans are mortgages taken out by social housing unions, where a part of the monthly redemptions are subsidised by the government and prior to 2018 the loans had been funded through mortgage banks' issuance of standard covered bonds with the loan choices being determined by the Ministry of Housing (only Realkredit Danmark, Nykredit and Jyske Realkredit funds subsidised social housing). In the beginning of 2018, there was DKK 180bn outstanding in subsidised social housing loans of which DKK 55bn was inflation-linked – linkers did not become part of the new agreement. However, the government saw a chance to lower the costs of subsidising such lending and so, in collaboration with the mortgage banks, came up with a model including the issuance of government guaranteed non-callable bullet bonds[27]. Hence, starting in 2018 all new subsidised mortgage lending would be funded by issuance of 10 year government guaranteed non-callable bullets and existing loans would be remortgaged into such loans[28]. Mortgage banks pay the government a provision of 0.12% of the notional principal in exchange for the guarantee.

[27] New capital centres were opened for this purpose in Realkredit Danmark (capital centre A), Nykredit (capital centre J) and Jyske Realkredit (capital centre S).
[28] All new lending (and existing remortgaged debt) will be 30 year loans incl. repayments with a 10 year interest-reset period.

As of June 2020, all callable mortgages had been remortgaged and only DKK25bn of existing interest-reset loans with a 5 year interest-reset period were still outstanding – the total outstanding of government guaranteed non-callable bullets was DKK98bn. The last remortgaging will take place in 2022. The amount of new loans disbursed are around DKK10bn per year.

The Danish government has since the change of the law bought all of the government guaranteed issuance. This has been done in order to lower the government's cash deposits with the central bank while at the same time uphold a reasonable issuance of government bonds (the government's cash deposits in the beginning of 2018 were at DKK180bn and thus more than DKK100bn above the target range). Thus, there is no trading activity in this market.

Floating rate/FRNs

Floating-rate loans intended for the corporate market

In recent years, we have seen increasing issuance in floating rate covered bonds (FRNs). The outstanding amount in FRNs amounted to 21% of the total covered bonds issued at the end of 2020, compared with 4% at the end of 2006. Floating rate mortgage loans are issued primarily to corporate borrowers offering a flexible opportunity to change interest rate risk with swaps, but CITA floaters are mostly offered to residential borrowers as CITA swaps do not trade with maturities ranging above two years.

Bond structure

The Danish floating rate covered bond market is very diversified and the bonds have a range of different characteristics (see table below). The majority of floating rate bonds are denominated in DKK or EUR with interest rate fixing against 3M EURIBOR, 3M/6M CIBOR and 6M CITA (6M CITA is the Danish equivalent to the 6M EONIA rate), respectively. However, some bonds are denominated in NOK with interest rate fixing against NIBOR (only RD) or SEK with fixing against STIBOR (NYK and RD).

Table 49. Characteristics of floating rate notes (FRNs)

Currency	DKK, EUR, SEK or NOK
Fixing rate	3M/6M EURIBOR, 3M/6M CIBOR, 3M/6M CITA, 3M STIBOR or 3M NIBOR (plus potential interest rate spread)
Cash flow profile	Annuity or bullet
Bond type	RO (20% risk weight), grandfathered RO or SDO/SDRO
Number of terms	2 or 4 terms per year
Interest rate fixing	1-Jan/1-Jul or 1-Apr/1-Oct. or 1-Jan/1-Apr/1-Jul/1-Oct
Fixing date	1st, 2nd, 3rd, 4th, 5th or 6th last banking day of Jun/Dec or Mar/Sep or Mar/Jun/Sep/Dec
Callable?	Callable or non-callable
Coupon multiplier factor	ACT/360 or ACT/ACT
Implied coupon floor	Some floater bonds have an embedded floor on the coupon rates of 0%

Source: Danske Bank.

Coupon multiplication factor

A coupon multiplication is used for some bonds when calculating the coupon rate at the time of fixing. For example, if the fixing is based on 6M CIBOR, the coupon rate is equal to 6M CIBOR multiplied by 365/360. The 365/360 multiplication is to neutralise the differences occurring from deviations in the interest rate conventions in the money market and the bond market; thus making the product suitable for derivatives solutions.

Some FRNs are callable at par

Some floating rate notes issued by Nykredit, DLR and Nordea Kredit are callable at par. Floating rate notes issued by Realkredit Danmark are all non-callable.

RO and SDRO/SDO

The majority of floating rate bonds are issued as SDO/SDRO bonds. However, some bonds were issued as RO before the implementation of the new Mortgage Act in 2007 and these bonds are grandfathered. There are also new bonds that are issued as RO under the new Mortgage Act. These bonds have a risk weight of 20%.

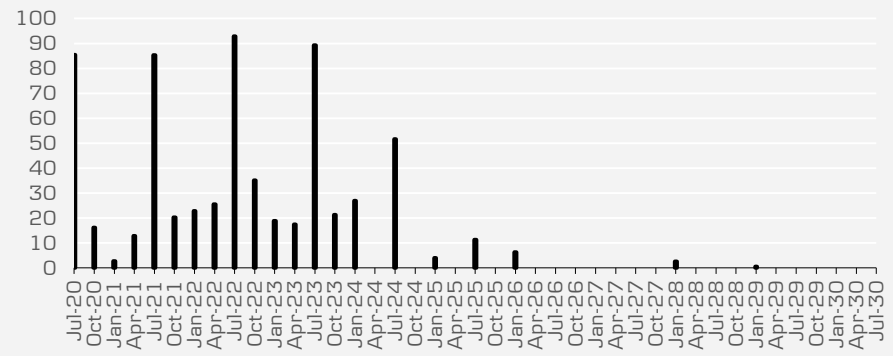
Embedded floors are phased out except in EUR

Some floater bonds cannot have negative coupon rates and hence the bonds have an embedded coupon floor of 0%. The 'problem' of negative coupons appeared for the first time in April 2015 in 3M CIBOR and 6M CITA based issues and all mortgage banks subsequently introduced a de facto floor on floating rate bonds. Thus, floating rate bonds issued before 1 July 2015 generally carry an embedded coupon floor. However, these bonds are almost all matured by now and are refinanced into floaters with no floor and it is currently only in EUR, NOK and SEK floaters where floors are expected to continue to prevail.

Maximum maturity of 35 years

Floating rate loans are offered as both annuity loans and bullet loans and the maximum maturity is 35 years. The majority of floating rate notes are issued in the 0- to five-year segment (see chart below).

Chart 20. Outstanding amount on FLTs June-2020 (EURbn)



Source: Danske Bank

Green bonds

In April RD became the first mortgage bank to introduce a green covered bond. The bond funds loans collateralised by commercial property. Nykredit followed in May 2019 (with a DKK and SEK green covered) and Nordea in November 2019 (RD opened a SEK green covered in May 2020). Currently DKK6.5bn is outstanding in DKK green floaters and SEK6.7bn in SEK green floaters.

Table 50. Outstanding green covered bonds

Mortgage bank	ISIN	Currency	Type (capital centre)	Fixing index	Outstanding amount (m)	Maturity
Realkredit Danmark	DK0004611993	DKK	SDRO (T)	6M CIBOR	4,319	1-Jul-22
	DK0004615986	SEK	SDRO (T)	3M STIBOR	-	1-Oct-24
Nykredit	DK0009523037	DKK	SDO (H)	3M CIBOR	2,134	1-Apr-23
	DK0009524514	DKK	RO (G)	3M CIBOR	425	1-Apr-23
	DK0009523110	SEK	SDO (H)	3M STIBOR	6,783	1-Oct-22
Nordea Kredit	DK0002046689	DKK	SDRO (2)	6M CIBOR	77	1-Jul-22

Source: Danske Bank

Handling of negative coupons in floating rate notes

As mentioned above floating rate notes issued today are primarily without an embedded coupon floor meaning that the coupon investors receive can become negative. That can potentially pose a range of issues like for an example what happens if an investor defaults on a negative coupon received? In order to circumvent such issues VP securities offers four models for which negative coupons can be handled towards investors (below we consider an interest-only bond trading at a price of 90 with a notional of 100 and a negative coupon of -1%).

1. The prepayment model at par value. In this model the investor is drawn an extra amount corresponding to the size of the negative coupon at a price of 0. In this case the investor will be drawn 1 (1% times 100) and end up with a notional of 99 after the coupon 'payment'. If the mortgage bank has chosen A. below there is a need for an extra issuance from the mortgage bank in order to balance notional on assets and liabilities. In this instance, the mortgage bank would make a tap in the same bond series with notional of 1.
2. The prepayment model at market value. In this model the investor is again drawn an extra amount corresponding to the negative coupon. However, the amount drawn is now no longer 1 but 1.11 (1%*100/90) and investor will end up with a notional of 98.89. If the mortgage bank has chosen A. below there is a need for an extra issuance from the mortgage bank in order to balance notional on assets and liabilities. In this instance, the mortgage bank would make a tap in the same bond series with notional of 1.11.
3. The liquidity model at par value. In this model investors will not be drawn an additional amount but instead the received payments will be lowered by the size of the negative coupon. So if we assumed there were ordinary repayments on the bond of 2 the payment to investor would be 1. However, as we in this case consider an interest-only bond the liquidity model defaults to the prepayment model at par value.
4. The liquidity model at market value. Same as in 3, however, in this case the model defaults to the prepayments model at market value.

The model chosen by Realkredit Danmark and Nykredit for their floating rate bonds is the prepayment model at par value, where as other mortgage banks have chosen the liquidity model (3 or 4).

Towards borrowers the following two market practices currently exist.

A. Lower the total payment to the mortgage bank. In the example above this would mean that borrowers would receive 1. However, as most borrowers either pay fees and/or repayments on top of interest rate payments, it only happens on very rare occasions that borrowers actually receive cash from the mortgage bank. All mortgage banks except Nykredit have chosen this model.

B. Make an extra redemption on the remaining principal of the borrower. If the borrower has a remaining principal of 100 the negative coupon of -1% means that the borrower's principal will be 99 after the 'payment' of the coupon. Only Nykredit makes use of this model.

In August 2019, Jyske Realkredit opened the first callable bond with a negative coupon (-0.5%) (DK0009398893) for which model 3 was chosen.

Capped floaters

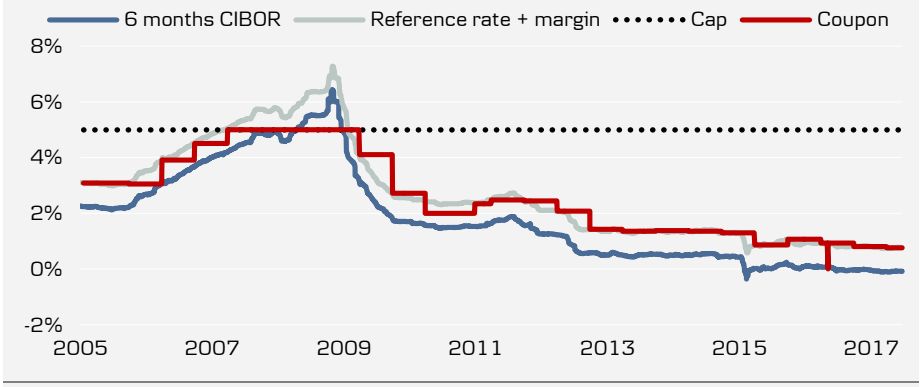
Capped floaters are floating rate bonds with embedded caps applying to the entire maturity of the loans maximised at 30 years. Capped floaters are based on a traditional cap structure in which interest rates are floating for the entire term of the bond, although they are maximised at the cap rate.

Interest rates for DKK-denominated bonds are fixed semi-annually based on six-month CIBOR plus a fixed margin each 1 April and 1 October or 1 January and 1 July. However, interest payments and redemptions fall due on 1 January, 1 April, 1 July and 1 October.

The funding of capped floating rate loans were done in 30Y bonds matching profile of the underlying loans (as is done by the funding of callable loans) until 2014. Since then the funding of capped floating rate loans has been done in bonds with up to seven year maturities, which are then refinanced on an ongoing basis as is the case with FRNs.

Some of the capped floaters issued up until 2014 are callable at 105 for the entire term to maturity. Market pricing of capped floaters has so far suggested that the call premium will be insignificant due to the cap structure rendering market prices substantially above par unlikely. The capped floaters' cap structure is illustrated below.

Chart 21. Capped floaters' cap structure, cap rate 5%



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Junior covered bonds (section 15 senior debt[29])

Introduced in 2007

Junior covered bond (JCB) is a bond type introduced into the Danish bond market in connection with the new Mortgage Act in July 2007. Mortgage banks may issue senior debt in order to raise supplementary capital or over-collateralisation requirement for rating purposes. It must be clearly stated in the loan documentation what capital centre the obtained funds are posted into and funds obtained this way must be placed in assets as set out in the Capital Requirements Regulation Article 129(1)a-f and 129(3).

Secured in the cover pool

Section 15 senior debt is secured in the cover pool but is subordinated to ROs and SDOs/SDROs. In the event of bankruptcy, payments to holders of section 15 senior debt will be deferred until senior covered bondholders and counterparties in certain derivatives agreements can be guaranteed payment in full. Also, although section 15 senior debt is collateralised by the entire cover pool, the bonds rank pari passu with senior unsecured debt holders of the mortgage bank in case there is insufficient funds left in the cover pool to pay off both senior and junior covered bondholders. Hence, junior covered bonds are not gilt-edged ('guldrandet') and do not fulfil UCITS.

[29] Section 33e was changed to section 15 in December 2012. Hence, Junior covered bonds were issued under section 33e in the Danish Mortgage Act before December 2012.

Given that Danish mortgage banks are exempted from bail-in the secondary preferential claim on cover assets will be upheld for section 15 senior debtholders in resolution and can thereby not be converted or written down[30]. This implies that holders of such debt will not experience payment deferral so long as the proceeds from the cover pool are sufficient to meet the payments on the senior covered bond. Hence, the debt class is not suitable to fulfil the debt buffer requirement and it can be expected that the issuance of ordinary senior unsecured debt will partly substitute the need for JCB issuance.

Limited outstanding amount

Nykredit and Jyske Realkredit were the only issuers of junior covered bonds until March 2012, when Realkredit Danmark announced that it had decided to issue junior covered bonds. DLR started to issue junior covered bonds in November 2012. Currently only DLR have issued publicly traded JCBs (under the name Senior Secured Bonds). RD's outstanding JCB's matured in 2019 (DKK 6bn), but have since raised DKK 4bn with the parent group in order to fulfil rating agencies OC requirements. This funding is used in Capital Centre T.

Senior debt from a mortgage bank is different from senior debt from a bank

Section 15 senior debt from a mortgage bank can be compared with traditional senior debt from a bank but there are a number of differences.

The proceeds from traditional senior debt from a bank are not placed in the cover pool, even though the bank is permitted to issue SDOs. However, just like a mortgage bank, the bank must top up with supplementary collateral if the value of the assets in the cover pool does not match the value of the SDOs issued.

Direct link to the cover pool

Hence, traditional bank debt has no 'direct link' to the cover pool and does not necessarily have to be used to buy assets that can serve as supplementary collateral. There is also a difference in the event of bankruptcy, as investors in traditional bank debt get their money back once the assets of the bankrupt estate have been added up and it can often take several years to settle an estate.

In the table below, we list some of the features that characterise SDO/SDRO and section 15 senior debt from a mortgage bank and traditional senior debt from a bank.

Table 51. Characteristics of SDO/SDRO bonds and senior debt

	SDO/SDRO	Senior debt (mortgage)	Senior debt (bank)
Gilt-edged	Yes	No	No
UCITS	Yes	No	No
BIS capital weight	10% or lower	20%	20%
Proceeds from issuance	Funding of home loans	Purchase of assets	No specific requirements regarding use of proceeds
Security in case of bankruptcy	Security in cover pool	Security in cover pool but subordinate to, e.g. SDO/SDRO investors	Subordinate to, e.g. all depositors
Payout in case of bankruptcy	No acceleration of cover pool	After covered bond investors, if there is money in cover pool	Immediately after bankruptcy, if there is money in the estate

Source: Danske Bank

[30] The 'no-creditor-worse-off' principle means that holders of section 15 senior debt would be eligible to claim compensation from a resolution fund. They are therefore not suited for bail-in.

6. Issuing and trading Danish covered bonds

Unlike most other types of bond issuance, which occur through a single auction or series of auctions (tranches), the majority of Danish covered bonds are issued by means of 'taps'. A tap issue refers to an ongoing type of periodic issuance, typically daily, in response to loan origination and refinancing.

Daily tap issuance

Specifically, during the day the funding units of the specialist mortgage banks (Danske Bank and Danmarks Skibskredit do not conduct taps in this way – see issuer profile on Danmarks Skibskredit for more) will provide market makers with a nominal amount and an ISIN for which market makers can make bids or offers – the latter if the mortgage bank intends to buy back some of its own outstanding bonds. This takes place through electronic auction or chat systems. The number of such 'tap auctions' during a single day can easily reach 20-plus for the larger mortgage banks among callables, floaters and non-callables and in the most liquid bonds multiple taps will be conducted in the same bonds at different times of the day. The funding units in each of the mortgage banks can take various amounts of risk, meaning that funding need not to be obtained on the very same day as a loan is originated. However, risk limits are in general very strict and funding will be obtained within a matter of days giving rise to the ongoing tap issuance.

Bonds issued directly to borrowers until the 1980s

Until the 1980s, Danish covered bonds were issued directly to individuals in need of mortgage finance. For example, if a customer needed DKK50,000 to purchase a house, that customer would enter into a borrowing agreement with the mortgage bank and receive a mortgage bond in return, which the customer would then sell in order to obtain the funds needed to purchase the property.

During the changeover from a bearer bond system to a registered bond system, this practice changed and the mortgage associations began to issue covered bonds on behalf of a pool of mortgage borrowers. However, the practice of regular and periodic issuance continued, with bonds issued in larger denominations and the underlying mortgage borrowers retaining a call option on their borrowings, allowing them the right to repay the funds advanced. Tap issuance today occurs on a daily basis in very large amounts. The set-up differs slightly among mortgage banks and there are differences in the amount of risk limits that each funding unit can take on. Overall, however, these limits are very low meaning that loan payments are typically matched by issuance on the same or next day of business.

Auction of non-callable bullet bonds

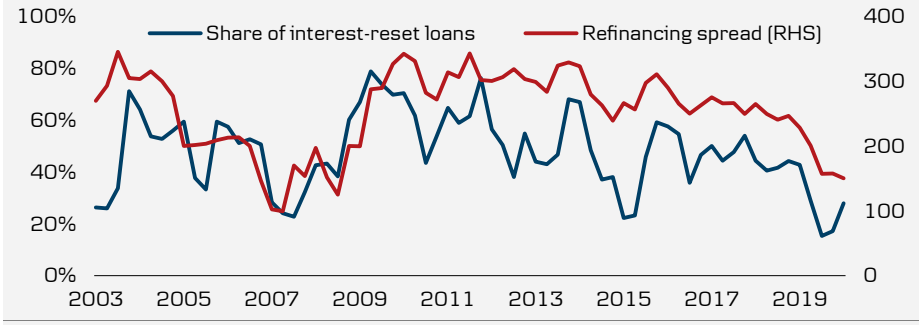
Subsequently, as issuance volumes grew, an auction system was introduced for non-callable bullet bonds (see Chapter 5). Traditionally, Danish covered bond issuers held a single annual refinancing auction. However, in recent years, Danish mortgage banks have increased the number of refinancing auctions to two, three or four per year in response to volume growth.

Issuance activity is driven largely by the slope of the refinancing curve

Issuance activity in the different covered bond segments is to some extent driven by the slope of the refinancing curve, especially for 30-year callable annuity bonds and the non-callable bullet bonds used to fund interest-reset loans. For example, in an interest environment with a steep refinancing curve, with low yields at the short end of the curve and high yields on 30-year callable annuity bonds, we usually see an increase in the gross lending of interest-reset loans relative to 30-year callable annuity loans.

The chart below shows the correlation between the steepness of the covered bond refinancing curve (the yield on a 30-year callable annuity bond minus the yield on a one-year non-callable bullet bond) and the lending amount of interest-reset loans as a share of the total volume of loans granted by Danish mortgage banks. Since 2012, mortgage banks have increased the contribution fees on interest-reset loans relative to 30-year callable annuity loans in order to increase the incentive for borrowers to choose a 30-year callable annuity loan. This has, to some extent, reduced the correlation between the refinancing spread and the share of interest-reset loans.

Chart 22. Correlation between share of interest-reset loans and refinancing spread



Note: Past performance is not a reliable indicator of current or future results
Source: Finance Denmark, Danske Bank

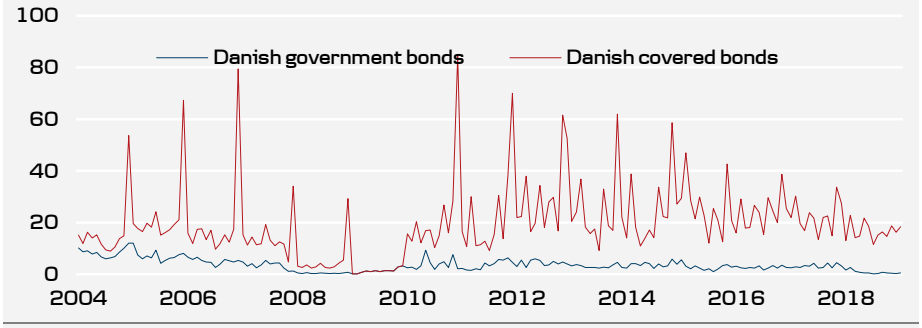
Trading Danish covered bonds

When trading covered bonds, the investor must allow for several practical elements. In this chapter, we also focus on the liquidity of covered bonds compared with that of government bonds and where to find current bond prices.

Turnover affected by global crisis

The Danish covered bond market has historically enjoyed deep secondary market liquidity with a high average daily turnover but, as the chart below shows, daily turnover reduced significantly during the financial crisis in 2008 and 2009. However, the low turnover did not hinder tap issuance in Danish covered bonds by the mortgage banks during the financial crisis. As shown in the chart below, there tends to be a spike in the turnover rate for Danish covered bonds in November/December, February/March, May and August/September, which is due to the refinancing auctions.

Chart 23. Daily average turnover of Danish bonds (DKKbn)



Note: Past performance is not a reliable indicator of current or future results
Source: Nasdaq Nordic Exchange, Danske Bank

Turnover of Danish bonds

In the past decade, the liquidity of covered bonds has exceeded government bond liquidity due to high levels of mortgage prepayments, high issuance activity and refinancing auctions, as covered bonds experience increased liquidity in such periods.

The table below shows the average daily turnover of selected Danish government bonds and Danish covered bonds throughout three months in 2020. Note the very large daily turnover in the 1'50 and 1'50io through March where spreads widened significantly.

Table 52. Average daily turnover (nominal)

DKKm	March 2020	April 2020	May 2020
DGB'22	40	37	106
DGB'25	36	31	57
DGB'29	22	162	40
RD 1% 2050 callable	1,053	350	308
RD 1% 2050 10 callable	802	276	131
RD 0.5% 2040 callable	183	103	74
RD 1% Jan-25	444	348	326

Source: NASDAQ OMX Nordic Exchange, Danske Bank

Highly liquid and diversified issuance, prices quoted by Danske Bank

Danske Bank quotes prices for the most liquid government bonds and covered bonds. The prices are available from Bloomberg (DBDK).

Difference in prices of otherwise identical series

A bond series of the same type but issued by different mortgage banks may see a slight difference in price when close to or above par because of different debtor distributions and differences in the borrowers' prepayment behaviour. A price difference may also be attributable to differences in liquidity and ratings differences.

Repo facility at the Danish central bank and the ECB

It is possible to do repos with Danmarks Nationalbank, the Danish central bank, against collateral in Danish covered bonds. The maximum loan limit depends, among other things, on the value of the collateral (after margin and haircuts). In addition, EUR-denominated covered bonds issued through VP securities and complying with the ECB's eligibility criteria are ECB eligible when they are approved by Danmarks Nationalbank and are entered on the ECB's list of eligible assets.

Market-maker schemes

With over 2,000 Danish covered bonds listed on the Nasdaq Nordic Exchange, it is evident that they are not equally liquid. Previously a market-maker scheme existed in some callable cash bonds, however, today that is only the case among listed futures on Nasdaq. See chapter 11 titled 'Danish covered bond futures'.

7. Prepayment

Borrowers raising a callable mortgage loan are entitled to prepay the mortgage at par prior to maturity. A borrower's right to prepay is embedded in one or two prepayment options.

- Callable loans have an embedded call option and a delivery option.
- Non-callable loans have an embedded delivery option only.

To comply with the specific balance principle described in Chapter 2, the borrower's call option must be embedded in issued covered bonds in order to achieve a perfect hedge, i.e. the mortgage banks do not suffer a loss when call options are exercised. The delivery option is embedded in almost all loans originated by Danish mortgage banks. It should be stressed that a loan does not necessarily have to be terminated or prepaid when a property changes hands. Accordingly, when a property is sold, the mortgage bank decides whether the new owner can take over the loan.

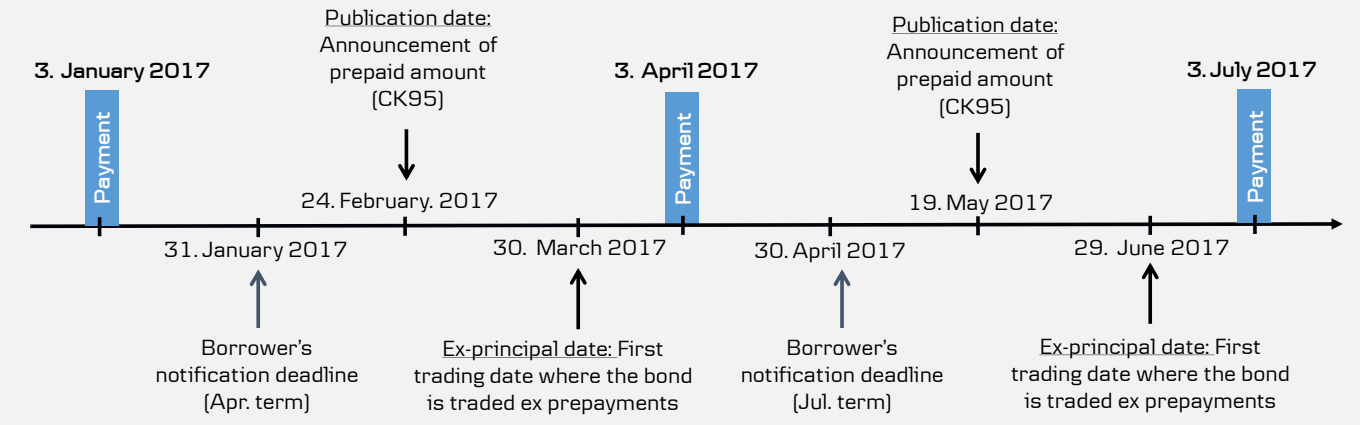
How to refinance a mortgage

Using the call option

If a borrower wants to exercise the call option and prepay a loan at par, he may choose between immediate prepayment and prepayment on the payment date. The former is the most common choice. Borrowers must give two months' notice before exercising the call option, i.e. notification dates are 31 January, 30 April, 31 July and 31 October.

About 40 days prior to the payment date, accurate information on the prepayment volumes for the individual bond series is available on the publication date. Extraordinary prepayments are distributed among investors according to the same principle of drawing as described above for ordinary repayments (see Chapter 5). The bond trades ex-principal (ex-prepayment) two days before the term date[31].

Chart 24. Important dates for mortgage bond refinancing



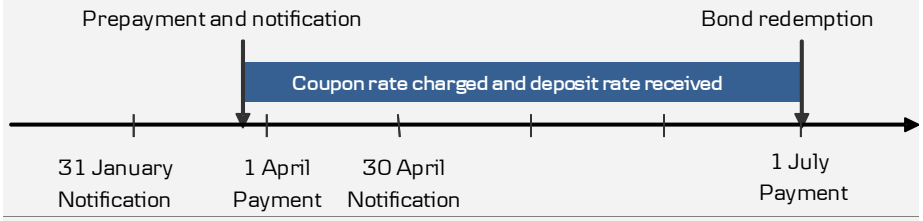
Source: Danske Bank

Immediate prepayment means that the remaining debt and interest payments are payable to the mortgage bank within three days, i.e. prior to the payment date. However, as investors are still entitled to their coupon payments, the borrower still has to pay the coupon until the payment date (1 January, 1 April, 1 July and 1 October), which, in principle, is the first date on which the loan may be prepaid.

[31] A new redemption model for callable bonds was introduced in October 2015. Before October 2015, the bonds traded ex-principal one day before the publication date.

Thus, the borrower prepays the remaining principal plus the coupon payment for the period until the payment date. The borrower is compensated for making the funds available to the mortgage bank until the payment date (see chart below). This compensation is normally calculated at a rate close to the current money-market rate.

Chart 25. Notification and payments in connection with extraordinary prepayment



Source: Danske Bank

Prepayment on the payment date means that the borrower does not have to prepay the remaining principal and the coupon due until the payment date.

When a borrower prepays a loan, it usually raises a new one. This involves two separate transactions and the borrower is therefore free to raise a mortgage loan with a different mortgage bank than the one with which the repaid loan was raised.

Using the delivery option

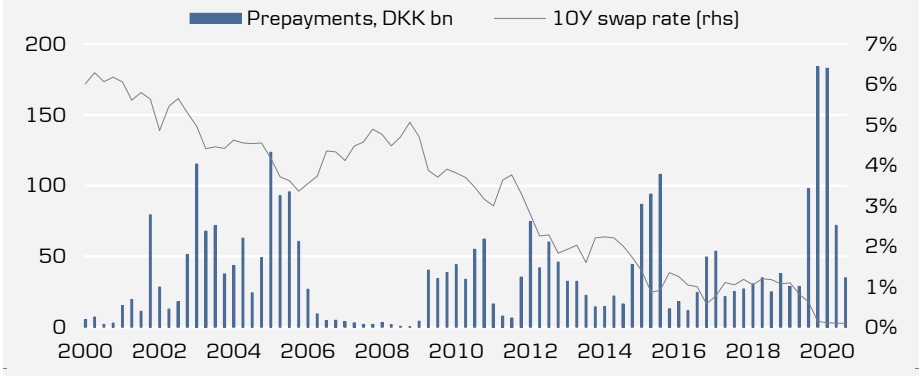
When a borrower exercises the delivery option, the underlying bonds are purchased at market price. By delivering the bonds to the mortgage bank, the loan is – fully or partially – redeemed. The borrower runs the hypothetical risk of not being able to buy the bond due to lock-in effects and the mortgage banks suffer no loss when the option is exercised.

Borrowers will exercise the delivery option only if the bond price is below par and will be charged a trading fee typically of 0.10-0.30% depending on the loan size.

Observed prepayment rates

Observed prepayment rates are indicated in the chart below and include both delivery and call option prepayments. As can be seen, observed prepayments are closely correlated to a decline in long-term interest rates, suggesting that remortgaging at a lower interest rate is the main reason for prepayment.

Chart 26. Correlation between long-term interest rates and prepayments



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Calculating prepayment gains

Most Danish mortgage loans are prepaid in connection with remortgaging (debt management) or in connection with the sale of a house (though prepayment is not compulsory, as the loan may be taken over by the new owner).

The advisory services provided by banks and mortgage banks focus on the gain on the first year's net payments and on the net present value of the old loan and the new loan alternative.

Today, borrowers focus primarily on liquidity savings in the form of lower net payments and their required gains are therefore measured mainly in terms of the difference between the first year's net payments on the existing loan and the new loan. In some cases, the first year's net payments are reduced but the gain measured in terms of the net present value of future payments is negative. This would typically be the case if the borrower chooses to raise a loan with a longer term to maturity than the old loan. Under such circumstances, some borrowers will want to refinance, while others prefer to wait until the net present value gain is positive and above a threshold level.

The second parameter in the advisory service is the difference in net present values, also called the prepayment gain.

The calculation of the prepayment gain is very sensitive to the yield curve applied. In practice, a flat yield curve corresponding to the after-tax yield on the refinancing alternative is often applied. The prepayment gain can be calculated using the following formula.

$$Prepayment\ gain = \frac{NPV(old\ loan) - (rem.\,debt + costs) \cdot Disc}{NPV(old\ loan)}$$

NPV (old loan) is the net present value of the old loan, corresponding to the remaining after-tax payments discounted at the after-tax yield of the new refinancing alternative. The *rem. debt* is the remaining debt to be refinanced and *costs* are the refinancing costs. *Disc* is the discounting factor from the payment date to the actual date on which the borrower decides to prepay the loan (no later than the notification date).

The borrower will most often be advised to refinance the mortgage based on a financial gain calculated in percent (as shown above) but also in absolute value.

Different types of remortgaging strategies

Borrowers have gradually become more conscious of managing their debt and increasingly use different remortgaging strategies to optimise their home financing.

Their choice of remortgaging strategy is heavily dependent on interest rate movements since the existing loan was raised and, in certain cases, the borrower's expectations with regard to future changes in interest rates. Below we set out a brief description of the most commonly used remortgaging strategies.

Remortgaging to a lower coupon

Following a substantial decline in interest rates, borrowers will benefit from remortgaging an existing loan to a new loan with a lower nominal rate of interest, as described above. The borrower will receive a gain in the form of lower future net payments and thus lower first-year net payments due to the lower interest rate. However, this type of remortgaging typically results in an increase in outstanding debt, depending on the price of the bonds underlying the new loan.

Remortgaging to a higher coupon

Following substantial increases in long-term interest rates, the borrower is able to reduce the outstanding debt by redeeming the old loan at a low market price and refinancing it through new bonds at a higher coupon than that of the original loan. However, this type of remortgaging leads to rising future payments because of the higher interest payments. Such remortgaging is therefore profitable only if interest rates decline again within a short time period. Borrowers initially achieve a reduction in their outstanding debt at the expense of higher payments, which they hope to be able to reduce by remortgaging to a lower coupon later.

Remortgaging to interest-reset mortgages

The introduction of interest-reset loans (see Chapter 5) formed the basis of a new type of remortgaging strategy. In periods of rising long-term interest rates and a substantial steepening of the yield curve and in periods of plunging short-term interest rates, borrowers holding a loan funded by long-term fixed rate bonds may remortgage their loans by redeeming the loan and refinancing it by raising a loan based on short-term bonds. The gain achieved from adopting this strategy is a reduction in the outstanding debt and lower future mortgage payments, assuming that future short-term refinancing rates remain low. In the opposite case, where long-term interest rates have plummeted and short-term interest rates are higher than long-term interest rates, the borrower is able to reduce his mortgage payments by remortgaging from an interest-reset loan based on short-term bonds to a fixed interest rate loan based on long-term bonds.

Following the introduction of interest-reset loans, borrowers have greater opportunities for achieving future remortgaging gains because redemption of the existing loan and disbursement of the new loan may take place at interest rates across the yield curve.

Remortgage gain depends on several factors

Prepayment gain depends on the borrower and size of the remaining principal

The remortgaging gain generally depends on several debtor-specific factors. Hence, it is of significance whether the borrower is a private individual or a corporate borrower because the tax deduction rate for interest paid by the borrower varies. However, in recent years, the tax deduction rate for private borrowers has been gradually.

In 'The Whitsun Package', which was part of the 1998 tax reform, the tax deduction rate for private individuals was reduced from an average of 46% to 33% and in the most recent tax reform, 'Forårspakken 2.0' from February 2009, the tax deduction rate was reduced yet again from 33% to 25% over a transitional period from 2012 to 2019. The deductible rate for businesses has also been reduced in recent years and stands at 22% today, compared with 34% in 1998.

Moreover, the size of the remaining principal typically determines the remortgaging gain. If the remaining principal is small, the refinancing costs in the form of a fixed fee weigh more. The gain is therefore relatively smaller than for a large remaining principal.

Finally, the remortgaging gain may depend on the term to maturity. Hence, the achieved gain is typically greater when refinancing a 30-year loan than when financing a shorter-term loan.

Refinancing campaigns by mortgage banks

In recent years, greater attention in the media and campaigns launched by mortgage banks have resulted in borrowers responding more quickly to the opportunities for a remortgaging gain.

Advisory services have also become more sophisticated and borrowers are able to have their refinancing opportunities monitored, meaning they are contacted when the remortgaging gain exceeds a pre-agreed level.

8. Estimating prepayments

Estimating prepayments is essential to the pricing of callable covered bonds — not just for the coming payment date but also for all future payment dates. Prepayments are important to investors as they affect cash flows. As a result, the duration of callable bonds is affected by changes in the estimated prepayment rates.

Estimating prepayments using traditional models

There are several different models for estimating prepayments, one of the most commonly used being the so-called capital gain requirement model where the parameters of the model are estimated based on historical prepayment data. This model assumes that a given debtor will refinance his loan if the obtainable remortgaging gain is greater than his debtor-specific required gain. Furthermore, the model allows for different debtor patterns by assuming that the various groups in the debtor distribution behave differently when it comes to borrowers' inclination to refinance at various rates. Before 1 January 2016, Danske Bank also used such a model to estimate the risk of callable bonds. In the section *Danske Bank's old model for callable bonds (traditional model)*, we have described our old model, which in many ways is similar to other banks' models for callable bonds.

Danske Bank has introduced a new SuperFly model

Instead of using a traditional method/model to estimate future levels of prepayments for callable bonds, Danske Bank has chosen a new path. Our new model approach (SuperFly) is not to *estimate future prepayments* based on historical prepayments data (as we did before with the traditional model), but to *estimate the prepayments implied* by the market. Hence, this is a new and unique method to calculate the risk of callable bonds.

Data for estimating prepayments

One of the most important factors affecting a borrower's prepayment decision is the gain from refinancing as described in Chapter 7. Historical prepayment rates and debtor distributions are used in the estimation of the parameters in traditional capital gain requirement models (traditional models).

Historical prepayment rates

Historical prepayment rates for each series give a first impression of the remortgaging sensitivity of a bond series. Traditionally, series that have experienced significant prepayments can be characterised as 'having lost their prepayment potential' as the remaining borrowers have presumably been able to realise decent refinancing gains at an earlier date. However, we increasingly see so-called burned-out series continuing to experience high prepayment rates.

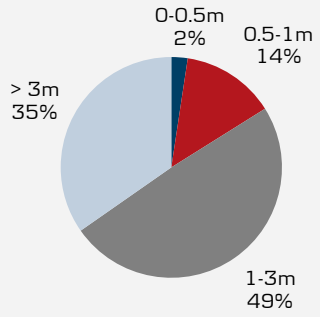
Debtor distributions

The debtor distribution of a bond series is a breakdown of the total underlying remaining debt. A debtor distribution table breaks down loans into five groups according to the size of the remaining debt in DKKm, the share of cash and bond loans and the share of corporate and private loans. This type of distribution makes it possible to divide borrowers into 20 debtor groups.

Corporate versus private loans

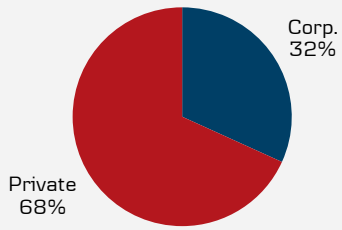
In traditional models, large corporate loans are generally assumed to have a higher remortgaging rate than small private loans, because these loans, due to the higher remaining principal, have a lower percentage cost when prepaying. The size of the remaining principal is important due to both its relation to fixed remortgaging costs and the psychological factor that makes a gain of DKK100,000 more tempting than a gain of DKK1,000.

Chart 27. Debtor distribution: loan size – RD 2.5% 2047



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Chart 28. Debtor distribution: private versus corporate – RD 2.5% 2047



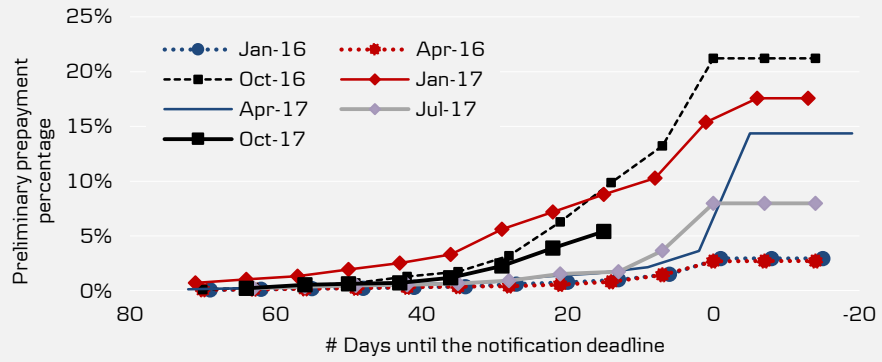
Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Preliminary prepayments

Every week, the individual mortgage banks publish preliminary prepayments for each series for future, non-published payment dates. These prepayments allow for an estimation of the volume of prepayments for the next payment date (comparison with previous payment dates). They also allow for a calculation of the share of total prepayments for a given announced preliminary prepayment by using prepayment data at the same time prior to the previous payment date. The preliminary prepayment rates are used in Danske Bank's new model (SuperFly) and in the old model (Danske Analytics).

Typically, preliminary prepayments are characterised by a strong exponential increase up to expiry of the notification period. Any expectation based on announced prepayments therefore becomes more reliable as the expiry of the notification period approaches. One may also track any differences between the institutions up to the notification date.

Chart 29. Evolution in preliminary prepayment rates – RD 3.5% 2044



Note: Past performance is not a reliable indicator of current or future results. It is not possible to invest directly in an index
Source: Danske Bank

SuperFly – a unique model for estimating implied prepayments

Instead of using a traditional method/model based on historical data to estimate future levels of prepayments for callable bonds, Danske Bank has chosen to implement a new model approach (called **SuperFly**) where the future prepayments are estimated as *prepayments implied* by the market. This is a new and unique method to calculate the risk of callable bonds. There are several reasons why we have chosen this new method, but the most important are the following.

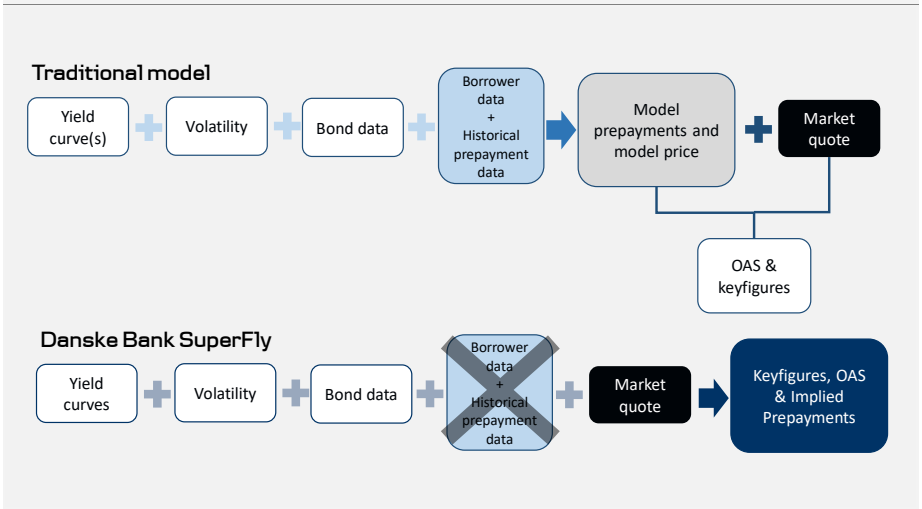
- The implied prepayment approach offers much greater flexibility in the model, which ensures more stable risk key figures. Hence, we do not expect to re-calibrate our model every quarter to align the model's expected prepayments to the actual prepayments, which was the case for our old, traditional model.
- We expect that the model will provide risk key figures that are more in line with markets' expectations of prepayments instead of our own model's expected prepayments.

So how do we estimate the implied prepayments? The price of the callable bond and the market interest rate are used to do the following.

- Determine whether the callable bond could see prepayments (mostly determined by the difference in the bond's coupon and the yield of an alternative mortgage loan).
- Determine how many prepayments the callable bond could see in order to be fairly priced (mostly determined by the price of the bond).

Hence, if the callable bond is trading well above par, this could indicate that the implied prepayments are low, whereas a lower price would indicate that the implied prepayments have risen. All the risk key figures are calculated on the back of the implied prepayments.

Chart 30. Overview of the inputs and outputs in a traditional model and the new SuperFly mortgage bond pricing model



Source: Danske Bank

Compared with our old, traditional model (and the standard for other banks still) the main difference is that the prepayments in our new model are *implied* by the market and not our *expected* prepayments.

Below we list some of the other important features of our new model.

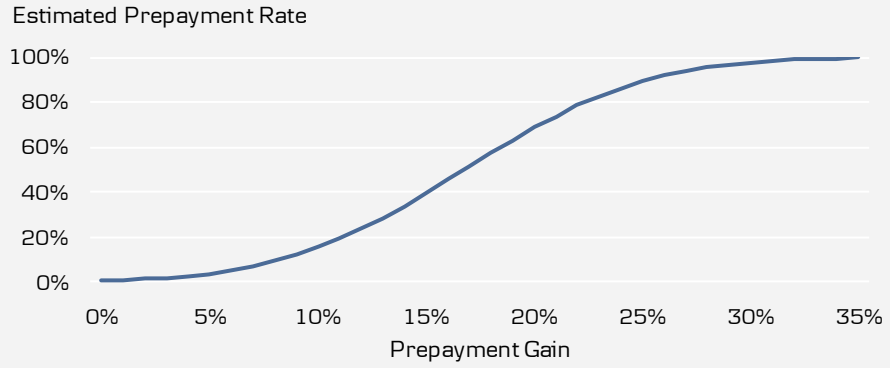
- The SuperFly mortgage bond model uses a 1-factor Cheyette model for generating rate scenarios. The Cheyette model is calibrated to an underlying European option model (typically a shifted SABR model) where the underlying zero-level is shifted to -2% due to the low rates. The mortgage bond model also includes a mortgage bond credit curve that measures the effective credit of the Danish mortgage bond market. It is expected that liquid mortgage bonds will trade close to levels of this curve.
- When pricing a callable mortgage bond, the Cheyette model is calibrated to a strip of swaptions reflecting the prepayment schedule of the bond in question. The strike and duration of the calibration swaptions are initially set to the coupon and maturity of the bond but then adjusted for the notional structure and the credit of the bond. This calibration then gives risk key figures, both delta and vega, that are consistent with the underlying rate and volatility models.
- The model shifts focus between the OAS and the implied prepayments depending on the yield level and the prepayment risk of the bond. For low coupon callable bonds with no prepayments the market (and our model) focuses on the OAS for input to relative value. For high coupon callable bonds the focus is instead on the prepayments, since investors price the bonds given their expectations of the level of future prepayments. Hence, the model also focuses on implied prepayments.
- Given the above, OAS for high coupon callables with prepayments is very close to zero and the focus should instead be on the levels of implied prepayments. In simple terms, if investors expect lower prepayments than the implied prepayments given by the model, the bond looks cheap.
- We provide a new key figure (OASWeight), which tells how much focus investors should put on the OAS rather than the implied prepayments.

Danske Bank's old model for callable bonds (traditional model)

Required gain model

In a traditional model, the relationship between prepayment gains and prepayments is often described using a normal distribution function where the estimation of the parameters of the model is based on historical prepayment data. The mean value indicates how large the modelled prepayment gain must be if the series has a prepayment rate of 50%. Based on a stochastic model of the yield curve, it is possible to calculate prepayment gains (for each debtor group) for the entire term of the bond in different interest rate scenarios.

Chart 31. Normal distribution of estimated prepayments



Source: Danske Bank

Before 1 January 2016, Danske Bank used a traditional model (Danske Analytics) based on a capital gain requirement model and a Gaussian term structure model of interests. The required gain model uses the refinancing gain, the pool factor[32] and the time to maturity of the existing loan as explanatory variables. The refinancing gain is the NPV gain the borrower can achieve by refinancing to a loan with the same time to maturity as the existing loan. The refinancing rate is assumed to be equal to the swap rate for the given time to maturity plus a debtor spread.

A debtor spread is added as the model is estimated using historical data. An extraordinary widening of spreads between mortgage bonds and swaps can cause inconsistencies between the assumed refinancing rate and the actual refinancing rate if no correction using the debtor spread is made. The debtor spread is estimated as the extraordinary spread between the mortgage bonds and swaps. Debtors are split into three groups – debtors with small loans, debtors with medium-sized loans and debtors with large loans. This should provide sufficient homogeneous behaviour in each group to use the same prepayment function for all debtors in the group.

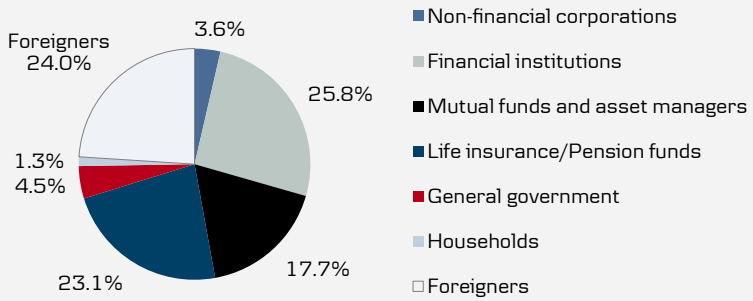
The term-structure model of interest rates is a Gaussian Hull & White model. It is calibrated to the DKK swap curve and swaption volatilities. The calibration to swaption volatilities incorporates the entire range of at-the-money swaptions.

[32] Outstanding mortgage pool principal as percentage of the original principal balance.

9. Investors in Danish covered bonds

The largest resident investor group in Danish covered bonds is financial institutions, holding 26% of the total volume of covered bonds. The second-largest domestic investor group in the Danish covered bond market is foreign investors at 24%, who have recently taken over this position from life insurance and pension funds (23%), while mutual funds and asset managers hold around 18%.

Chart 32. Investors in Danish covered bond market -- April 2020

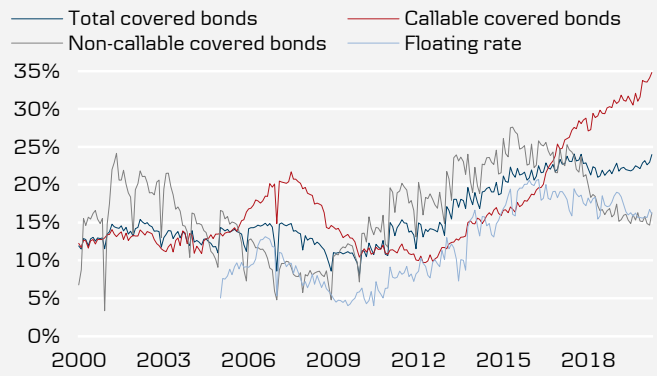


Source: Danmarks Nationalbank, Danske Bank.

Life insurance companies and pension funds are characterised by their long-term investment horizon and the greater part of this sector's total bond holdings consists of Danish covered bonds in both the long and short end of the curve. Short dated non-callable bullets are useful for liquidity management whereas the longer duration callable bonds provide excess carry to alternatives. The holdings of banks and mortgage banks are also concentrated in Danish covered bonds and amount to a nominal DKK799bn. This investor group is characterised by a relatively short-term investment horizon.

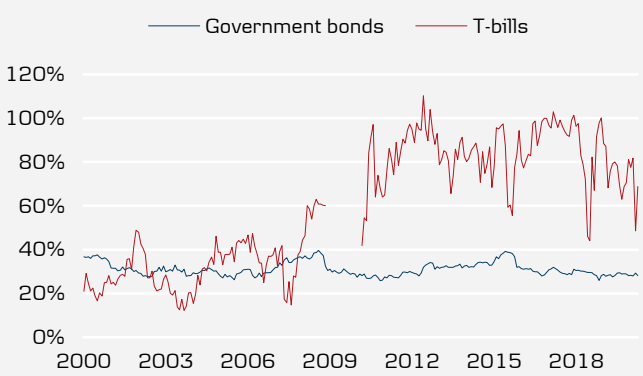
Traditionally, foreign investors have been significant players in the Danish government bond market but over the past decade they have also shown an increased interest in Danish covered bonds. Based on statistics from April 2020, foreigners own a nominal DKK741bn worth of Danish covered bonds, equivalent to 24% of the total volume of Danish covered bonds. For comparison purposes, foreigners' holdings of government bonds at the time amounted to a nominal DKK185bn, or 31% of the total volume of Danish government bonds. The development has been especially noteworthy in the callable bond segment where foreigners now own 35% of the market, which is not least made up of Japanese investors.

Chart 33. Foreign ownership of Danish covered bonds



Source: Danmarks Nationalbank, Danske Bank

Chart 34. Foreign ownership of Danish government bonds



Source: Danmarks Nationalbank, Danske Bank

Bond-specific portfolio shares

Foreign investor areas of interest

In the last decade, foreign investors have at times shown a particular interest in one-year non-callable bullet series and from January 2016 to January 2018 foreign investors owned more than 30% of the outstanding amount in non-callable bullet bonds with less than 1Y to maturity (however note that some hedge funds operating out of Denmark are registered as foreign investors). This is so since the FX swap at times provided for a decent pick-up to EUR and USD, however currently the short end is less interesting for foreign investors. As of April 2020, foreign investors held for an example just 15% of RD's 1% Apr-21 (corresponding to the average ownership share in this maturity segment) and 4% of the total outstanding amount in RD 1% Jan-25.

Looking instead at the longer duration callable bonds we once again clearly see that foreign investors prefer the 30Y highly negative convex bonds. For example foreign investors own an entire 60% of RD's 1.5'50io and just 15% of the less convex and shorter duration 0.5% 2040. We also note that financial institutions (note: excluding mortgage banks) are much less active in this part of the maturity spectrum as treasury departments primarily invest in shorter and less risky bonds. The long end holdings of financial institutions are partly stemming from the investment bank arms of the largest Danish banks due to market making, that as of April 2020 was slightly short of the 30Y segment.

Table 53. Investor distribution – April 2020

	RD 1% Apr-21	RD 1% Jan-25	RD 1% 2050	RD 1.5% 2050 IO	RD 0.5% 2040
Outstanding amount (DKKbn)	46.7	15.1	56.6	9.9	14.9
Financial institutions*)	14.2%	10.1%	-1.5%	-1.0%	6.1%
Life insurance/pension funds	45.5%	39.1%	44.6%	13.8%	24.9%
Mutual funds & asset management	9.1%	23.7%	16.0%	19.0%	34.6%
Foreigners	15.4%	4.3%	35.1%	59.3%	15.0%

** Excluding mortgage banks*
Source: Danmarks Nationalbank, Danske Bank

Resident investors

Furthermore, investments from life insurance companies and pension funds are fairly evenly distributed due to a need for both liquidity buffers and a long and stable return. Mutual funds are mostly active in the mid segment, which is 5Y non-callable bullets and 10-20Y callables.

10. Performance

Danish covered bonds have traditionally provided a yield pickup compared with, for example, Danish swaps or government bonds. This yield difference is estimated by the asset swap spread (ASW) for non-callable bonds and floater bonds and option-adjusted spread (OAS) for callable bonds. Moreover, general risk measures such as the Macaulay duration do not apply to callable mortgage bonds, but instead the duration can be described using option-adjusted duration or OA-BPV. For a description of all key figure see our key figure description here: *Danish Mortgage Bonds: Key figure descriptions*, 23 December 2019.

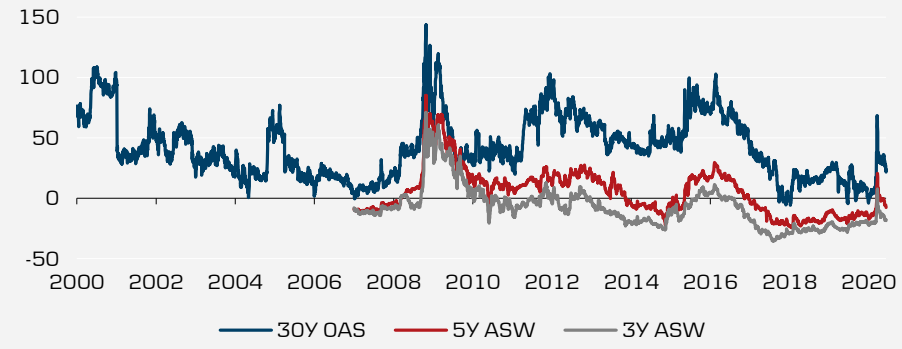
Option-adjusted spread (OAS)

The OAS specifies the additional yield compared with the Danish swap curve when the callable covered bond have been adjusted for estimated prepayments. The OAS is an indicator of the additional yield that can be obtained by holding the callable covered bond and reflects the prepayment and credit risks as well as liquidity considerations. A widening OAS indicates that the bond has become cheaper relative to swaps and vice versa. Note that the OAS depends on the model used for forecasting future prepayments.

Asset swap spread (ASW)

The ASW specifies the spread against 3M or 6M CIBOR for non-callable bullet covered bonds, floaters and capped floaters. The ASW for the capped floaters is calculated under the assumption that the cash flow of the capped floaters can be hedged using an amortising cap.

Chart 35. Danish covered bonds OAS/ASW v/ DKK6M (bp)



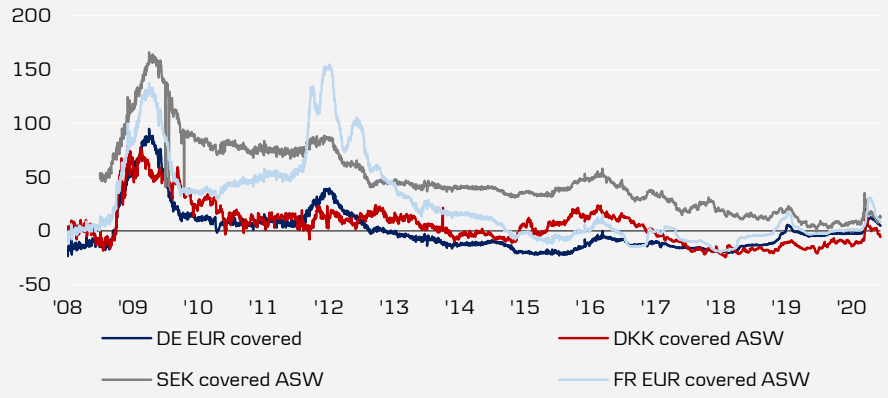
Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Historical development in spreads

The spreads (OAS and ASW) for the Danish covered bonds experienced a quite significant widening in autumn 2008 due to the increased risk aversion in the market. However, compared with other European covered bonds, the spread widening in Denmark was moderate (see the chart below). In addition, the Danish bond market was fairly unaffected by the European debt crisis in 2011-2012, as investors used the Danish bond market as a 'safe haven'.

Since 2012, we have seen a significant tightening of the (local) ASW spreads on European covered bonds driven partly by the ECB's CBPP. Over the same period, spreads on Danish covered bonds traded in a relatively stable range until 2015, when we saw a gradual widening of spreads. The drivers of the spread widening in 2015 were uncertainty about the impact of regulation (for example the implementation of the LCR as of 1 October 2015, uncertainty regarding leverage ratio and risk weights) and increased volatility in financial markets. In recent years, we have seen a significant tightening of the spreads (OAS and ASW) for the Danish covered bonds only halted by a sharp widening of spreads in March 2020 where OAS widened 60bp in just a week following world-wide lockdowns in face of the coronavirus. Spreads, however, returned to pre-crisis levels in a matter of two months.

Chart 36. Covered bond ASW spreads (bp)

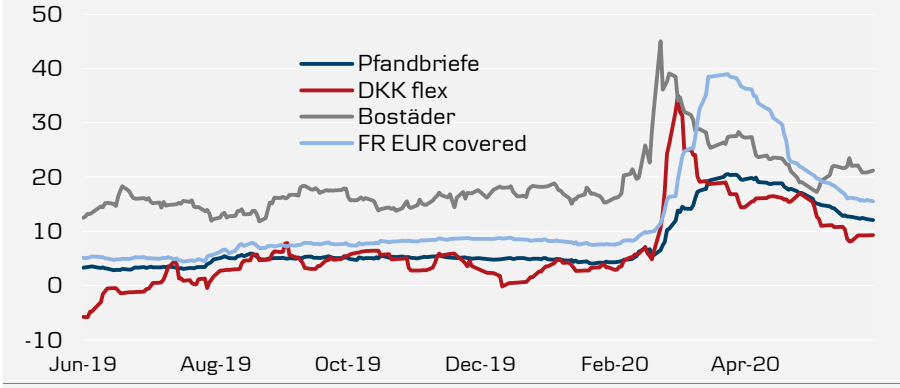


Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Cross-currency swapped ASW spread

The ASW 3M CIBOR spreads for Danish covered bonds are more or less at the same ASW levels (ASW 3M EURIBOR) as European covered bonds. In Chart 3 we look at DKK, SEK and EUR (DE and FR) covered bonds. We see that SEK covereds typically trade slightly wider in local ASW terms as compared to alternatives. Danish hedge funds are generally very active switching in and out of DKK and SEK covered bonds when spreads diverge too much. Danish investors active in EUR covereds are mostly with a longer term investment horizon due to the lower liquidity.

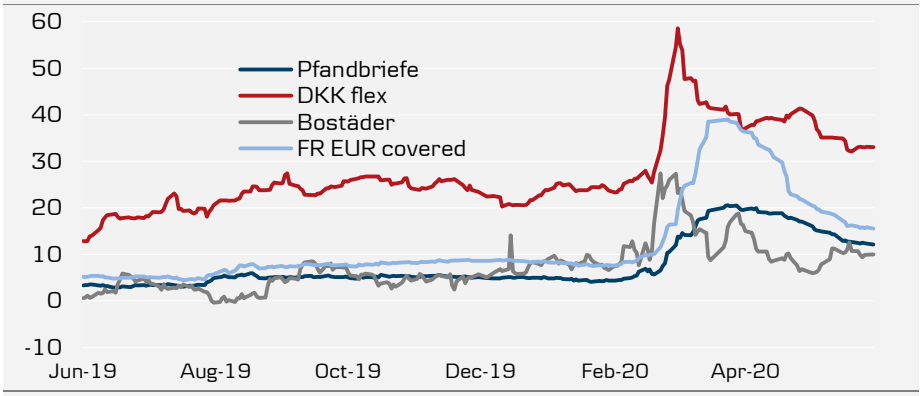
Chart 37. Generic 5Y local ASW 3M spread for European covered bonds (bp)



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

However, looking at the cross-currency swapped ASW spread where the ASW 3M CIBOR spread is swapped into 3M EURIBOR, the spreads of the Danish covered bonds currently trade with a pickup relative to European peers due to a wide cross currency basis swap (see the chart below).

Chart 38. Cross-currency swapped ASW 3M EURIBOR



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Risk

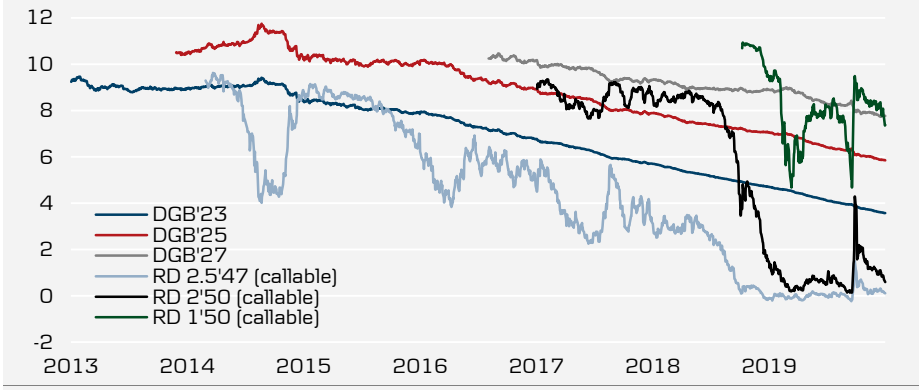
Option-adjusted risk measures

As suggested by the name, option-adjusted BPV (OA-BPV) adjusts for the embedded option when calculating the interest rate risk of the callable covered bonds. The OA-BPV may thus be slightly negative for bonds far above par. This is the case when the effect of prepayments being influenced by interest rate changes is greater than the mere discounting effect. This means the price may fall even though interest rates are falling.

The charts below show the BPV for Danish government bonds DGB'23, DGB'25, DGB'27 and OA-BPV for the callable bonds RD 2.5'47, RD 2'50 and RD 1'50. The OA-BPV for Danish callable covered bonds has decreased in the recent year due to the decreasing interest rate level and increasing prepayment risk, but the BPV of the 1'50 is more or less unchanged.

Chart 39. BPV for Danish covered bonds and Danish government bonds

BPV government bonds and non-callable covered bonds and OA-BPV for callables



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

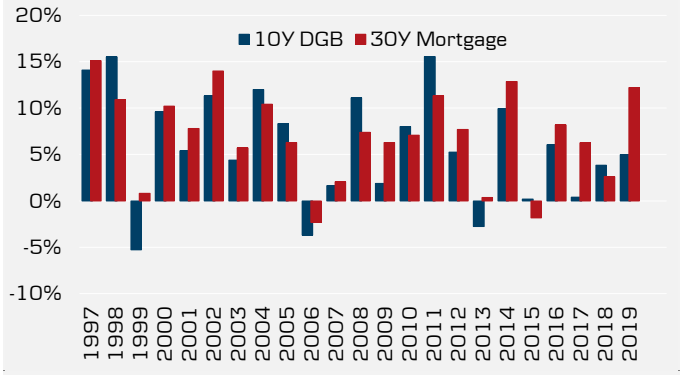
Historical returns

The charts below illustrate developments in the annual return on the 30-year covered bond benchmark index and the 10-year government benchmark index since the end of 1996. As the chart below right shows, 30-year Danish covered bonds in general outperform 10-year government bonds.

However, in 2004, 2005 and later on in 2008, 2011 and 2015, the 10-year government benchmark outperformed the 30-year covered bond benchmark. This is partly a consequence of the 30-year covered bond benchmark simply having lower duration compared with the 10-year government benchmark over this period. Combined with an environment of decreasing interest rates, it led to a larger capital gain for the 10-year government benchmark.

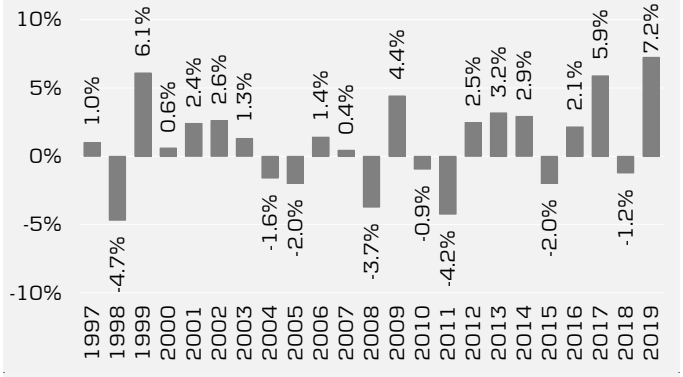
In 1998 and 2008, the Danish covered bond underperformed against the 10-year government bond due to financial turmoil. The underperformance was increasing volatility and significant spread (OAS) widening – 1998 was dominated by the bankruptcy of Long Term Capital Management and 2008 was the peak of the financial crisis. However, the negative performance in 1998 and 2008 was followed by very high positive performances in 1999 and 2009, as the market turmoil eased and the spread tightened. In 2015 government bonds generally performed well when compared to callables due to very high interest rate volatility and prepayments.

Chart 40. Annual total return for 10Y DKK government and 30Y fixed-rate mortgage bond



Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Chart 41. Excess return on 30Y fixed rate mortgage bond relative to 10Y DKK government

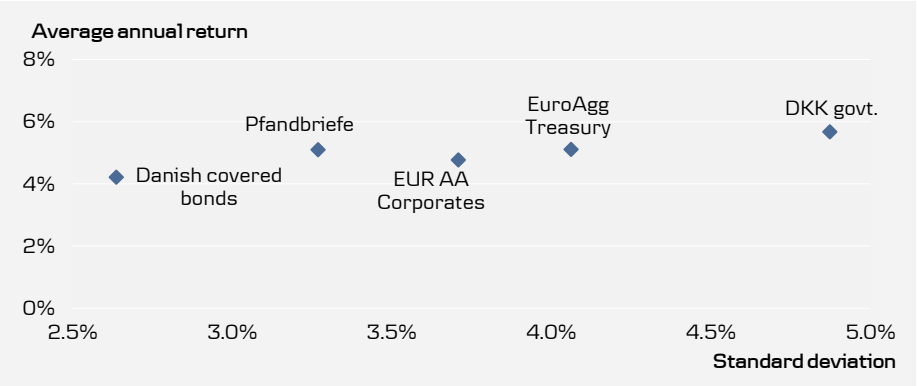


Note: Past performance is not a reliable indicator of current or future results
Source: Danske Bank

Returns on the Danish and euro bond markets

The chart below illustrates returns on various European asset types measured against the standard deviation of the return. The asset types include the following indices: EUR government bonds (Bloomberg Barclays EuroAgg Treasury index), Pfandbriefe (Iboxx five to seven years), Danish government bonds (Danske Bank Danish government bond index), Danish covered bonds (Nykredit Danish mortgage bond index) and EUR AA-corporates (Iboxx five to seven years). The listed returns are calculated as average annual returns for the period from the end of 2006 to the end of 2016. Over this period, Danish covered bonds offered the least volatility and an average annual return marginally lower than other European asset types.

Chart 54. Historical return on Danish and EUR bonds from Dec-06 to Dec-16



Note: Past performance is not a reliable indicator of current or future results. It is not possible to invest directly in an index.
Source: Bloomberg data, iBoxx, Danske Bank

11. Futures on Danish covered bonds

The Nasdaq Nordic Exchange introduced a bond future on a basket of underlying Danish covered bonds in October 2009 and at the same time established a market-maker scheme in the future (initial spread of DKK0.10 for DKK50m). The future is settled daily on a marked-to-market basis and the settlement amount is fixed by the Nasdaq Nordic Exchange as the difference between the current future price and the future price of the previous trading day. Settlement is made via the Nasdaq Nordic Exchange, which is where netting of positions between market makers is carried out.

The basis of the agreement in the market-maker regime is a CSA plus any premiums or alternatively a clearing account with the Nasdaq Nordic Exchange.

Table 55. Settlement procedure for market makers

Settlement	Daily settlements via Nasdaq Nordic Exchange
Netting	Yes
Agreement base	CSA plus any premiums, or a clearing account with Nasdaq Nordic Exchange

Source: NASDAQ Nordic Exchange, Danske Bank

Characteristics similar to government bond futures

Danish covered bond futures (MBF) expire every third month at the end of March, June, September and December and settlement day is 1 April, 1 July, 1 October and 1 January (or the first business day thereafter). New future contracts are opened about a month before the existing contract expires; thus, positions in one future contract can always be rolled into the next future contract – just like, for example, German government bond futures (Bunds, Bobl, etc.).

There are currently three bond futures on Danish covered bonds. There are two bond futures on 20Y and 30Y callable covered bonds and one bond future on three- to five-year non-callable covered bonds. The contracts have a contract size of DKK1m and a tick size of DKK0.001.

Table 56. Danish mortgage bond futures with expiry 29 September 2020

ISIN	SE0014384087	SE0014384111	SE0014384103
Name	3YMBFU0	30YMBFU0	20YMBFU0
Expiry	29-Sep-20	29-Sep-20	29-Sep-20
Contract size (DKKm)	1	1	1
Tick size (DKK)	0.001	0.001	0.001
Underlying basket	1'23 (Apr) (25%) 1'24 (Apr) (25%) 1'25 (Jul) (25%) 2'25 (Apr) (25%)	1'50 (50%) 1'50 IO (50%)	0.5'40 (100%)

Source: Nasdaq Nordic Exchange, Danske Bank

The Danish covered bond futures each consist of a basket of underlying unit bonds. Each underlying unit bond usually consists of more than one covered bond series (i.e. from different mortgage banks or 'colours'). For example, the future contract (3YMBFU0) on three- to five-year non-callable covered bonds consists of four unit series (1% Apr-23, 1% Apr-24, 2% Jan-25 and 1% Apr-25), each weighted 25%. At delivery, the seller of the future contract can choose freely which of the different underlying bond series (which issuers) to deliver. Thus, a delivery option is included in the future similar to that seen in, for example, German government bond futures (Bunds, Bobl, Schatz, Buxl).

The table below lists the bonds in the underlying basket of the 3YMBFU0 that are due to be delivered when the future expires.

Table 57. Bond series to be delivered on the 3YMBFZ7 bond future

Series	ISIN code	Name	Volume (DKKbn)
1% Apr-23	DK0009295065	RD 1'23 (Apr)	49.0
	DK0009391021	JYSK 1'23 (Apr)	15.0
	DK0002039981	NDA 1'23 (Apr)	9.8
1% Apr-24	DK0009295149	RD 1'24 (Apr)	35.6
	DK0009391104	JYSK 1'24 (Apr)	8.4
	DK0002042779	NDA 1'24 (Apr)	10.5
2% Jan-25	DK0009296469	NYK 2'25 (Jan)	16.0
1% Apr-25	DK0009798480	RD 1'25 (Apr)	16.9

Source: Nasdaq Nordic Exchange, Danske Bank

Delivery, fixing and calculation

Delivery is at the fixing price on the coupon day of the underlying bonds or else the next business day. The fixing price is calculated by Nasdaq Nordic Exchange immediately after 10:00 CET on the expiry day of the future contract. The calculation is based on the prices quoted by the various market makers (published by Reuters) for the underlying covered bonds. The fixing is calculated as an average of the middle prices of the various market makers after ignoring the highest and lowest price. The fixing is calculated to three decimal places and published at 11:30 CET on the day of expiry.

The seller of the future contract can freely choose among the various issuers ('colours') in the basket of unit bonds when delivering, though delivery must be in accordance with the weights stated above. Therefore, the seller of the future contract has a delivery option on the underlying bonds, while the buyer of the future contract has implicitly sold this delivery option.

The futures contracts are almost solely traded by market makers and a market-maker scheme exists in all futures contracts with pre-defined bid/offers.

12. Available information

The Danish mortgage banks provide information to investors via the Nasdaq Nordic Exchange (Nasdaq). Nasdaq publishes data on Danish covered bonds according to specified guidelines. These data are released on specific dates and at specific times. If one of these specific dates fall on a non-business day, publication generally takes place on the next business day.

Cash flows: on a quarterly basis

Nasdaq publishes cash flows for each individual bond. These specify principal and interest payments for all coming payment dates until the bond expires. For open series, cash flows are calculated according to the principles of the Nasdaq, while actual cash flows for the closed series are published by the mortgage banks. The cash flows are published no later than 12 working days after the term date.

Debtor distribution: on a monthly basis

Details concerning debtor distribution are provided by the mortgage banks and separate the underlying loans into borrower groups, remaining debt groups and loan types. The debtor distribution data are published no later than four days before the fourth Thursday of the month.

Preliminary prepayments: on a weekly basis

Mortgage banks publish on a weekly basis data on preliminary prepayments comprised of nominal extraordinary repayments for coming, non-published payment dates. Data are based on registered loan terminations for coming payment dates, including immediate prepayments but excluding repayments by delivery of bonds.

Final prepayments: on a quarterly basis

On a quarterly basis, mortgage banks publish data on final prepayments (ordinary as well as extraordinary) for the next payment date comprised of nominal repayments as well as total repayment and prepayment percentages. The final prepayment amounts are published on the publication date and provincial prepayment/redemption rates are announced. The final prepayment/redemption percentages are published one working day before the term date.

Table 58. Available information

Data	Calculated	Sent to Nasdaq Nordic Exchange	Available from Nasdaq Nordic Exchange
Cash flows Payment date, instalment, interest	Quarterly	12 working days after the term date	12 working days after the term date
Debtor distribution Borrower group, remaining debt, loan type	Monthly	Fourth Thursday of every month	Same day
Preliminary prepayments Payment date, nominal amount	Every Friday	Monday after the calculation day	Same day
Final prepayment amount Payment date, nominal amount, total repayment amount., prepayment amount	Quarterly	One working day before the publication date	Publication date
Final prepayment percentage Payment date, nominal amount, total repayment percent., prepayment percent	Quarterly	Two working days before the term date	One working day before the term date

Source: Nasdaq *Nordic* Exchange, Danske Bank

Sources

- Bloomberg.
- Jyske Realkredit.
- Danish FSA.
- Danmarks Nationalbank.
- Danske Bank.
- DLR Kredit.
- European Covered Bond Council (ECBC).
- European Mortgage Federation (EMF).
- Finance Denmark.
- Fitch Ratings.
- iBoxx.
- LR Realkredit.
- MacroBond Financials.
- Moody's Investor Service.
- Nasdaq Nordic Exchange.
- Nordea Kredit.
- Nykredit.
- Realkredit Danmark.
- Standard & Poor's.
- Statistics Denmark.

Disclosures

This research report has been prepared by Danske Bank A/S ('Danske Bank'). The authors of this research report are Daniel Brødsgaard (Analyst), Jens Peter Sørensen (Chief Analyst), Sverre Holbek (Chief Analyst) and Jan Weber Østergaard (Chief Analyst).

Analyst certification

Each research analyst responsible for the content of this research report certifies that the views expressed in the research report accurately reflect the research analyst's personal view about the financial instruments and issuers covered by the research report. Each responsible research analyst further certifies that no part of the compensation of the research analyst was, is or will be, directly or indirectly, related to the specific recommendations expressed in the research report.

Regulation

Danske Bank is authorised and subject to regulation by the Danish Financial Supervisory Authority and is subject to the rules and regulation of the relevant regulators in all other jurisdictions where it conducts business. Danske Bank is subject to limited regulation by the Financial Conduct Authority and the Prudential Regulation Authority (UK). Details on the extent of the regulation by the Financial Conduct Authority and the Prudential Regulation Authority are available from Danske Bank on request.

Danske Bank's research reports are prepared in accordance with the recommendations of the Danish Securities Dealers Association.

Danske Bank is not registered as a Credit Rating Agency pursuant to the CRA Regulation (Regulation (EC) no. 1060/2009); hence, Danske Bank does not comply with nor seek to comply with the requirements applicable to Credit Rating Agencies.

Conflicts of interest

Danske Bank has established procedures to prevent conflicts of interest and to ensure the provision of high-quality research based on research objectivity and independence. These procedures are documented in Danske Bank's research policies. Employees within Danske Bank's Research Departments have been instructed that any request that might impair the objectivity and independence of research shall be referred to Research Management and the Compliance Department. Danske Bank's Research Departments are organised independently from and do not report to other business areas within Danske Bank.

Research analysts are remunerated in part based on the overall profitability of Danske Bank, which includes investment banking revenues, but do not receive bonuses or other remuneration linked to specific corporate finance or debt capital transactions.

Danske Bank is a market maker and liquidity provider and may hold positions in the financial instruments mentioned in this research report.

Danske Bank, its affiliates and subsidiaries are engaged in commercial banking, securities underwriting, dealing, trading, brokerage, investment management, investment banking, custody and other financial services activities, may be a lender to the companies mentioned in this publication and have whatever rights are available to a creditor under applicable law and the applicable loan and credit agreements. At any time, Danske Bank, its affiliates and subsidiaries may have credit or other information regarding the companies mentioned in this publication that is not available to or may not be used by the personnel responsible for the preparation of this report, which might affect the analysis and opinions expressed in this research report.

Financial models and/or methodology used in this research report

Calculations and presentations in this research report are based on standard econometric tools and methodology as well as publicly available statistics for each individual fixed income asset.

We base our conclusion on an estimation of the financial risk profile of the financial asset. By combining these risk profiles with market technical and financial asset-specific issues such as rating, supply and demand factors, macro factors, regulation, curve structure, etc., we arrive at an overall view and risk profile for the specific financial asset. We compare the financial asset to those of peers with similar risk profiles and on this background, we estimate whether the specific financial asset is attractively priced in the specific market. We express these views through buy and sell recommendations. These signal our opinion about the financial asset's performance potential in the coming three to six months.

More information about the valuation and/or methodology and the underlying assumptions is accessible via *http://www.danskebank.com/en-uk/ci/Products-Services/Markets/Research/Pages/researchdisclaimer.aspx*. Select *Fixed Income Research Methodology*.

Risk warning

Major risks connected with recommendations or opinions in this research report, including a sensitivity analysis of relevant assumptions, are stated throughout the text.

Completion and first dissemination

The completion date and time in this research report mean the date and time when the author hands over the final version of the research report to Danske Bank's editing function for legal review and editing.

The date and time of first dissemination mean the date and estimated time of the first dissemination of this research report. The estimated time may deviate up to 15 minutes from the effective dissemination time due to technical limitations.

See the final page of this research report for the date and time of completion and first dissemination.

Validity time period

This communication as well as the communications in the list referred to below are valid until the earlier of (a) dissemination of a superseding communication by the author, or (b) significant changes in circumstances following its dissemination, including events relating to the market or the issuer, which can influence the price of the issuer or financial instrument.

Investment recommendations disseminated in the preceding 12-month period

A list of previous investment recommendations disseminated by the lead analyst(s) of this research report in the preceding 12-month period can be found at *http://www.danskebank.com/en-uk/ci/products-services/markets/research/pages/researchdisclaimer.aspx*. Select Fixed Income Trade Recommendation History

Other previous investment recommendations disseminated by Danske Bank are also available in the database.

See *http://www.danskebank.com/en-uk/ci/products-services/markets/research/pages/researchdisclaimer.aspx.* for further disclosures and information.

General disclaimer

This research has been prepared by Danske Bank A/S. It is provided for informational purposes only and should not be considered investment, legal or tax advice. It does not constitute or form part of, and shall under no circumstances be considered as, an offer to sell or a solicitation of an offer to purchase or sell any relevant financial instruments (i.e. financial instruments mentioned herein or other financial instruments of any issuer mentioned herein and/or options, warrants, rights or other interests with respect to any such financial instruments) ('Relevant Financial Instruments').

This research report has been prepared independently and solely on the basis of publicly available information that Danske Bank A/S considers to be reliable but Danske Bank A/S has not independently verified the contents hereof. While reasonable care has been taken to ensure that its contents are not untrue or misleading, no representation or warranty, express or implied, is made as to, and no reliance should be placed on, the fairness, accuracy, completeness or reasonableness of the information, opinions and projections contained in this research report and Danske Bank A/S, its affiliates and subsidiaries accept no liability whatsoever for any direct or consequential loss, including without limitation any loss of profits, arising from reliance on this research report.

The opinions expressed herein are the opinions of the research analysts and reflect their opinion as of the date hereof. These opinions are subject to change and Danske Bank A/S does not undertake to notify any recipient of this research report of any such change nor of any other changes related to the information provided in this research report.

This research report is not intended for, and may not be redistributed to, retail customers in the United Kingdom (see separate disclaimer below) and retail customers in the European Economic Area as defined by Directive 2014/65/EU.

Disclaimer related to distribution in the United States

This research report was created by Danske Bank A/S and is distributed in the United States by Danske Markets Inc., a U.S. registered broker-dealer and subsidiary of Danske Bank A/S, pursuant to SEC Rule 15a-6 and related interpretations issued by the U.S. Securities and Exchange Commission. The research report is intended for distribution in the United States solely to 'U.S. institutional investors' as defined in SEC Rule 15a-6. Danske Markets Inc. accepts responsibility for this research report in connection with distribution in the United States solely to 'U.S. institutional investors'.

Danske Bank A/S is not subject to U.S. rules with regard to the preparation of research reports and the independence of research analysts. In addition, the research analysts of Danske Bank A/S who have prepared this research report are not registered or qualified as research analysts with the New York Stock Exchange or Financial Industry Regulatory Authority but satisfy the applicable requirements of a non-U.S. jurisdiction.

Any U.S. investor recipient of this research report who wishes to purchase or sell any Relevant Financial Instrument may do so only by contacting Danske Markets Inc. directly and should be aware that investing in non-U.S. financial instruments may entail certain risks. Financial instruments of non-U.S. issuers may not be registered with the U.S. Securities and Exchange Commission and may not be subject to the reporting and auditing standards of the U.S. Securities and Exchange Commission.

Disclaimer related to distribution in the United Kingdom

In the United Kingdom, this document is for distribution only to (I) persons who have professional experience in matters relating to investments falling within article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (the 'Order'); (II) high net worth entities falling within article 49(2)(a) to (d) of the Order; or (III) persons who are an elective professional client or a per se professional client under Chapter 3 of the FCA Conduct of Business Sourcebook (all such persons together being referred to as 'Relevant Persons'). In the United Kingdom, this document is directed only at Relevant Persons, and other persons should not act or rely on this document or any of its contents.

Disclaimer related to distribution in the European Economic Area

This document is being distributed to and is directed only at persons in member states of the European Economic Area ('EEA') who are 'Qualified Investors' within the meaning of Article 2(e) of the Prospectus Regulation (Regulation (EU) 2017/1129) ('Qualified Investors'). Any person in the EEA who receives this document will be deemed to have represented and agreed that it is a Qualified Investor. Any such recipient will also be deemed to have represented and agreed that it has not received this document on behalf of persons in the EEA other than Qualified Investors or persons in the UK and member states (where equivalent legislation exists) for whom the investor has authority to make decisions on a wholly discretionary basis. Danske Bank A/S will rely on the truth and accuracy of the foregoing representations and agreements. Any person in the EEA who is not a Qualified Investor should not act or rely on this document or any of its contents.

Report completed: 1 July 2020, 00:52 CEST

Report first disseminated: 1 July 2020, 08:15 CEST