Danish Mortgage Credit

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INTRODUCTION AND SUMMARY

Danish mortgage bonds have performed well during both the financial crisis and the sovereign debt crisis. During the debt crisis, they have traded at lower yields than many other comparable European bonds, and the yield spread between Danish government and mortgage bonds is narrow compared with the equivalent spreads in other countries. Negotiability in mortgage bonds has been maintained, even in the period when issuance of comparable European bonds fell sharply.

This reflects that the Danish economy is more resilient than those of other countries in several respects. Denmark has sustainable public finances and relatively low government debt given the size of the economy – two factors currently attracting market attention. These are probably some of the reasons why Danish mortgage bonds have displayed the same characteristics as assets considered to have safe-haven status during periods of financial turmoil.

However, this development would not have taken place if investors had not regarded Danish mortgage bonds as being among the safest assets. Low credit risk and high liquidity are preconditions to achieving safe-haven status. The low credit risk in the Danish mortgage-credit sector is supported by a large number of legal and institutional conditions set out in Danish legislation. These include the underlying collateral, requirements for the institutions and the legal framework in the event of e.g. a borrower's non-performance or the compulsory liquidation of a mortgage bank. Liquidity is underpinned by the direct match between the loans granted and the bonds issued and by mainly issuing mortgage bonds in large series.

At the same time, the mortgage-credit sector is facing challenges that have been revealed by the crisis. One challenge is linked to the funding of 30-year loans by bonds with maturities of only 1 year. The interest rate is paid in full by the borrower when the loan is refinanced, and the mortgage bank is therefore initially protected against risks ensuing from higher interest rates. However, the financial crisis has illustrated that markets can cease to function. Interest rates can also rise so much that many borrowers will have difficulty servicing their debt, resulting in higher credit risk for the mortgage bank. The likelihood of such an event is very small, but the potential consequences can be substantial if many loans are affected at the same time. Another challenge is the legal obligation to provide top-up collateral for a large share of the bonds issued if the value of the underlying collateral no longer meets the maximum loan-to-value ratio. Funding may be relatively expensive, and requires the mortgage banks to have sound earnings. Moreover, credit rating agencies have on several occasions tightened conditions for maintaining their rating of mortgage bonds.

The sector has taken steps to address these challenges, but further adjustment of the business models and framework conditions of the mortgage banks should still be expected.

The section below describes market developments in recent years, followed by an outline of the composition of the mortgage bond market, including sizes, bond types and the conditions supporting liquidity. Subsequently, special regulation and business conditions aimed at ensuring low credit risk in the Danish mortgage credit system are described. The challenges faced by the sector and how they are tackled are described in the perspectives section at the end of this article.

DANISH MORTGAGE BONDS DURING THE FINANCIAL CRISIS AND THE SOVEREIGN DEBT CRISIS

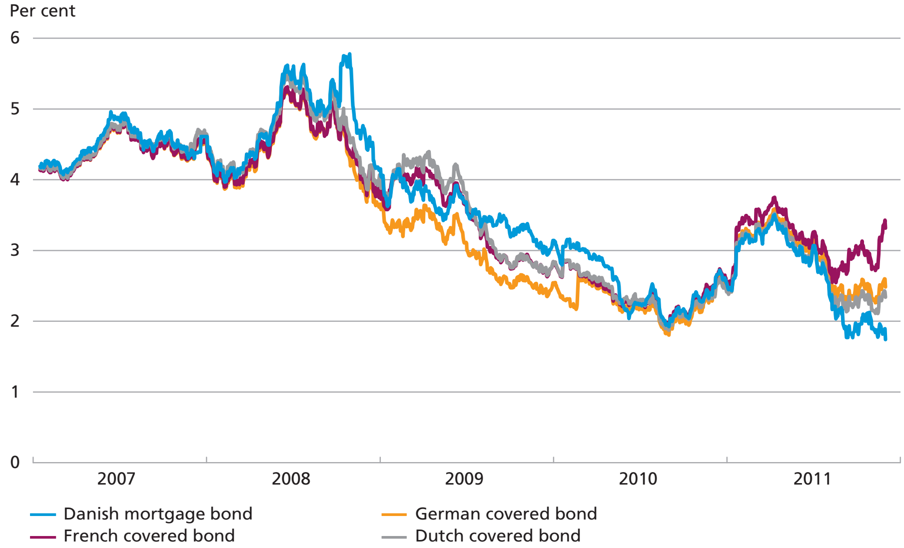
The Danish mortgage-credit market is among the largest in the world and has attracted international investors for many years. From their perspective, it is natural to compare Danish SDOs[1] and covered bonds from other European countries, which qualify for a low risk weight by meeting pan-European rules for capital adequacy.

Yields

In recent years, Danish mortgage bonds have offered low yields on a par with some of the most creditworthy issues from other European countries. Both during the financial crisis and during the ongoing sovereign debt crisis, bond yield spreads have widened, cf. Chart 1. Since early 2011, and especially since August 2011, yields on Danish mortgage bonds have generally been lower than yields on other comparable European bonds. Yields on bonds from some of the largest French and

[1] In the following, SDOs is used as a generic term for covered bonds, *særligt dækkede obligationer*, SDO, and covered mortgage bonds, *særligt dækkede realkreditobligationer*, SDRO. Moreover, the term mortgage bonds denotes traditional mortgage bonds without SDO status as well as SDRO and SDO issued by mortgage banks, unless otherwise stated.

YIELD LEVELS FOR MORTGAGE BONDS COMPARED WITH COVERED BONDS Chart 1



Note: The chart states the yield to maturity on large, fixed-rate, bullet loans issued by Realkredit Danmark, Eurohypo AG, CIE Financement Foncier and ABN Amro Bank NV. The individual time series are composed of several bonds to maintain a maturity of 4-5 years. Where no comparable bond exists with an appropriate remaining time to maturity, linear interpolation between bonds with longer and shorter maturities has been applied. The selected bonds are considered to reflect the general development. The Danish bonds have been issued in Danish kroner, the other bonds in euro.

Source: Bloomberg.

German issuers have thus been up to 1.5 and 0.7 per cent higher, respectively, than yields on equivalent Danish mortgage bonds.

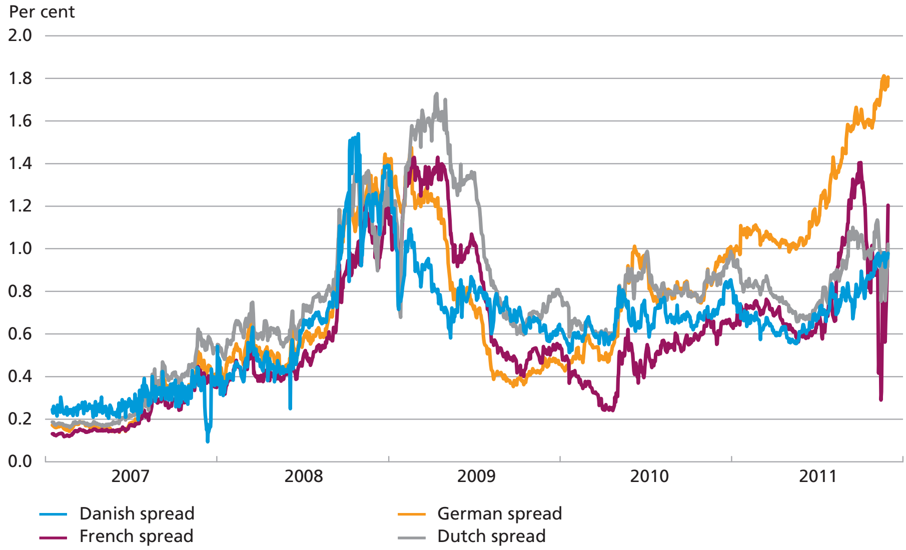
The spread between Danish mortgage and government bonds has been narrow in the past year compared with the corresponding spreads in Germany and France, cf. Chart 2. In countries with high ratings, the spread between mortgage and government bonds provides an indication of the market price of credit risk, to the extent that government bonds are considered almost risk-free. Lately, investors have required a higher risk premium for e.g. German and French bonds than for Danish mortgage bonds. The most recent spread narrowing for French covered bonds is partly due to French government bond yields having increased relative to e.g. their German equivalents in connection with the sovereign debt crisis.

Danish short-term mortgage bond yields were higher than comparable European bond yields from end-2008 to mid-2010. The higher yield on Danish mortgage bonds in this period was to some extent due to a higher monetary-policy interest rate in Denmark than in the euro area, which was also reflected in Danish short-term government bond yields.

The spread between Danish long-term mortgage bonds and government bonds also widened sharply in October 2008. A contributing factor

SPREADS OF MORTGAGE BONDS AND COVERED BONDS TO GOVERNMENT BONDS

Chart 2



Note: The yield spread is calculated as the differential between yields in Chart 1 and yields on government bonds from the same country and with corresponding maturities. Where no comparable bond exists with an appropriate remaining time to maturity, linear interpolation between the bonds with longer and shorter maturities has been applied.

Source: Bloomberg.

was foreign investors' sales of Danish mortgage bonds because the Danish market was still liquid compared with other markets. The spread widening and the increase in mortgage yields led to decoupling of mortgage yields from the interest rates applied for calculating the value of the liabilities of insurance and pension companies.[1] Consequently, long-term mortgage bonds could not be used to the same extent for hedging the liabilities of insurance and pension companies, and while the market value of Danish long-term mortgage bonds fell significantly, the value of the liabilities did not decrease correspondingly. This led to a risk that the insurance and pension sector would divest substantial volumes of mortgage bonds to avoid this basis risk. At the end of October 2008, the Pension Package was concluded. Among other things, this agreement entailed that the yield on mortgage bonds was temporarily to be included in the yield curve used by pension companies to calculate their liabilities. The parties have subsequently prolonged and adjusted the agreement. It is open-ended, as there was agreement that it ensures an appropriate transition to the new Solvency II rules governing the pension sector.

1 The value of the pension companies' liabilities is calculated on the basis of a yield curve set by the Danish Financial Supervisory Authority, reflecting current market conditions.

The spread between government and mortgage bonds narrowed considerably just after the agreement, a trend that continued in the following months. For part of 2009, the spread was thus smaller than the corresponding spreads in Germany, France and the Netherlands.

Negotiability of mortgage bonds

Danish mortgage bonds maintained market access throughout the financial crisis. In the 2nd half of 2008 and the 1st half of 2009, issuance levels for European covered bonds fell substantially, while issuance of mortgage bonds remained unchanged. This was most pronounced when the financial crisis peaked in the last three months of 2008. During this period, issuance of jumbo[1] covered bonds accounted for only 2 per cent of the volume issued in the same period of the previous year, cf. Chart 3. The Danish issuance level in the same period (kr. 523 billion) was slightly higher than in the previous year (kr. 513 billion).

A significant share of the issuance was related to refinancing of adjustable-rate mortgage loans at auctions in November and December, which were completed without serious problems. The Social Pension Fund's purchase of short-term mortgage bonds worth kr. 27 billion in December 2008 has been mentioned as a contributing factor. The potential effect should be viewed in the perspective of the total issuance of mortgage bonds in the period.

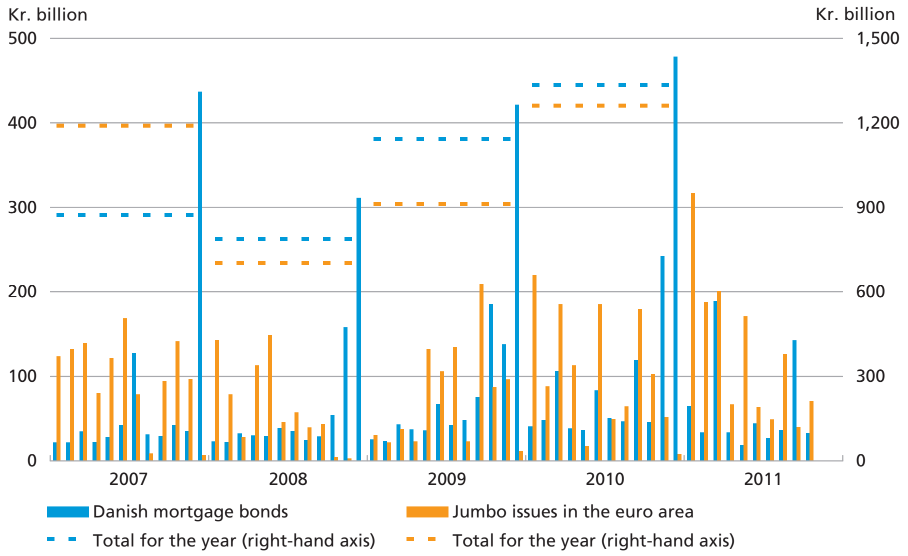
Danmarks Nationalbank has analysed liquidity in Danish mortgage bonds compared with Danish government bonds in the period from January 2005 to May 2010, cf. Buchholst et al. (2010). The analysis applies the Amihud liquidity measure, which is based on the price impact of executing transactions in the market. The analysis includes bonds with an outstanding volume equivalent to more than 1 billion euro and is based on transactions of kr. 10 million or more. The analysis shows that the liquidity of Danish mortgage bonds generally matches the liquidity of Danish government bonds in periods of financial market turmoil.

In recent months, Danish mortgage bonds have displayed the same characteristics as assets considered to have safe-haven status during periods of financial turmoil. An asset can obtain this status by maintaining stable value and high negotiability at times when the values of many other assets decline. An important explanation behind recent developments is probably that Denmark is viewed as a stable investment country, and that Danish bonds in the current situation are considered to be an attractive alternative by investors seeking a high degree of

1 See note to Chart 4.

ISSUANCE OF MORTGAGE BONDS IN DENMARK AND JUMBO COVERED BONDS IN THE EURO AREA

Chart 3



Note: For the euro area only jumbo issues are included, i.e. issues with an outstanding volume of at least 1 billion euro, and which meet specific requirements for market making and bond type. Thus, jumbo issues do not include all covered bond issues in the euro area. SDOs issued by banks and a ship finance institution are not included.
Source: Danmarks Nationalbank and Credit Suisse First Boston.

safety. This has benefited Danish mortgage bonds as well as government bonds. However, this development would not have taken place if Danish mortgage bonds had not been regarded as being among the safest assets. The following describes the special conditions in the Danish mortgage-credit system which underpin the low credit risk and the high liquidity. This may help provide an understanding of why Danish mortgage bonds stand out as attractive in an international context.

A LARGE AND LIQUID MARKET

Market size and composition

The total outstanding volume of Danish mortgage bonds amounted to kr. 2,515 billion at the end of October 2011, cf. Table 1. The large outstanding volume reflects the widespread use of mortgage banks for property financing. At end-October 2011, mortgage loans accounted for 70 per cent of total lending by Danish banks and mortgage banks to households and non-financial corporations.

There are seven mortgage banks in Denmark, of which the five largest have issued more than 99 per cent of the outstanding mortgage bonds. The four largest mortgage banks offer loans to both households and enterprises, while the rest do not grant loans to households.

OUTSTANDING MORTGAGE BONDS, END-OCTOBER 2011 Table 1

Mortgage banks	Outstanding volume at market value, kr. billion	Per cent
Nykredit (incl. Totalkredit)	1,082	43.0
Realkredit Danmark	736	29.3
Nordea Kredit	339	13.5
BRFkredit	209	8.3
DLR Kredit	134	5.3
LR Realkredit	14	0.5
FIH Kredit[1]	0	0.0
Total	2,515	100.0

Source: Danmarks Nationalbank.
1 FIH's outstanding bonds totalled kr. 250 million, corresponding to 0.01 per cent of the total outstanding volume.

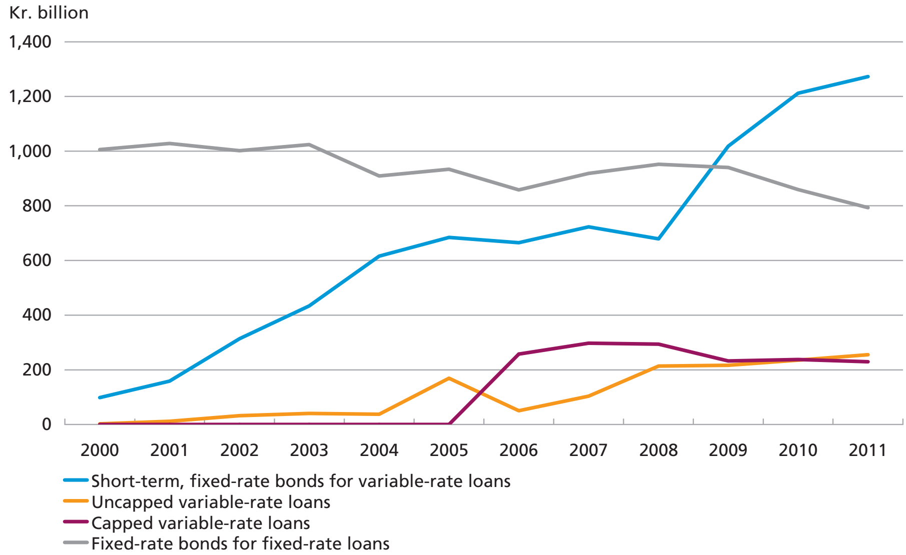
A distinctive feature of the Danish mortgage-credit system is that the conditions of the bonds issued precisely reflect the conditions of the loans granted, see below. The borrower's choice of loan type therefore determines the composition of the outstanding mortgage bonds.

Fixed-rate, callable bonds are typically 30-year bonds and give the borrower a right to redeem the loan at par. Before 2000, the mortgage bond market consisted almost entirely of bonds of this type.

In 1996, mortgage banks began to offer adjustable-rate mortgage loans based on short-term, fixed-rate bonds, which are refinanced every time the interest rate is reset, and since 2000 in particular, the share of these loans has increased sharply, cf. Chart 4. At the time of issuance, they often have a maturity of 1 year, but 3-year and 5-year bonds are also issued. A key reason for the rise in demand for adjustable-rate mortgage loans is that short-term interest rates have been substantially lower than their long-term equivalents. Borrowers have obtained a relatively low interest rate, partly because investors tie up liquidity for a short period only.

Moreover, a minor proportion of the mortgage-credit loans are financed by variable-rate bonds with maturities of up to 30 years. The interest rate is fixed e.g. semi-annually based on a reference rate. The bonds – and hence also the loans – can be with or without an interest rate cap. The outstanding volume increased most in the period 2004-08, but subsequently new issuance has been limited. As a result of the increased investor focus on liquidity and credit risk after the financial crisis, investors want higher compensation for tying up their funds for up to 30 years, and interest rates on variable-rate loans funded by longer-term bonds have therefore risen compared with adjustable-rate mortgages. Some mortgage banks are now offering 30-year loans based on 10-year capped variable-rate bonds.

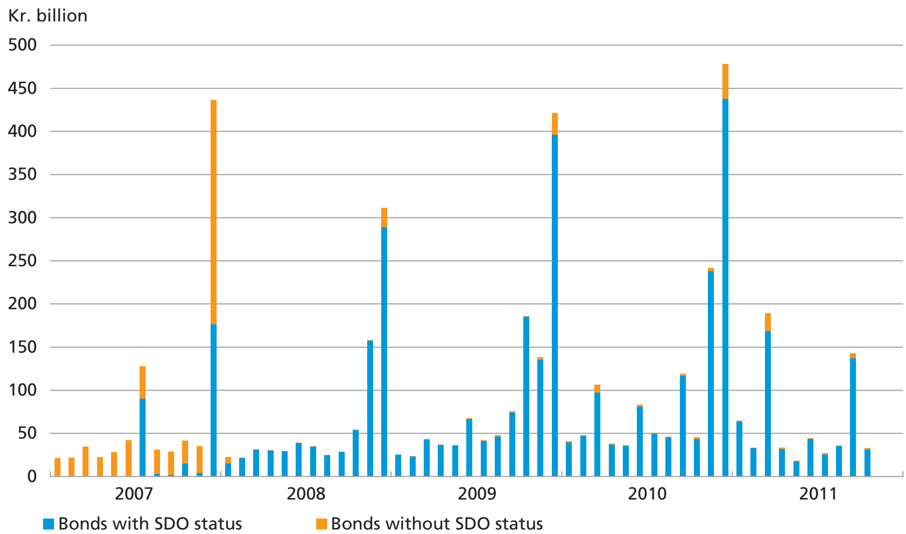
OUTSTANDING MORTGAGE BONDS BROKEN DOWN BY LOAN TYPE Chart 4



Note: Market value of outstanding volume at end-August. Before 2006, capped variable-rate loans are included under uncapped variable-rate loans.
Source: Danmarks Nationalbank.

As a consequence of new lending, remortgaging and loan refinancing, mortgage bonds are in practice being issued all year round, cf. Chart 5. However, issuance activity increases strongly towards year-end when many adjustable-rate mortgages are refinanced.

NEW ISSUANCE OF MORTGAGE BONDS WITH AND WITHOUT SDO STATUS Chart 5



Note: Stated at market value, end of month.
Source: Danmarks Nationalbank.

BONDS WITH SDO STATUS Box 1

Following the amendment to the Capital Requirements Directive, new legislation was passed in Denmark in 2007, giving the mortgage banks access to issuing bonds with SDO status. These bonds meet pan-European rules and can qualify for a lower risk weighting in credit institutions holding the bonds than bonds without this status.

The new Danish rules give the mortgage banks the possibility of issuing covered mortgage bonds, SDROs, and covered bonds, SDOs. When the mortgage banks issue this type of bonds, they are obliged to ensure that adequate top-up collateral is provided, e.g. if the market value of a property declines, or the market value of the bonds rises so much that the loan-to-value ratio is exceeded for the individual loan.

Before the amendments to the mortgage-credit legislation in July 2007, all mortgage banks' loans were financed by issuing mortgage bonds, for which the mortgage banks were not obliged to provide top-up collateral.

With the legislative amendment, the banks and a ship finance institution were also given access to issuing SDOs. The outstanding volume corresponds to about 3 per cent of the market for bonds issued by mortgage banks.

Legislation on SDOs entered into force in 2007, cf. Box 1. Since then, the majority of new bonds have had SDO status, cf. Chart 5. SDOs now account for around 65 per cent of the total outstanding mortgage bonds and their share is expected to rise in the coming years.

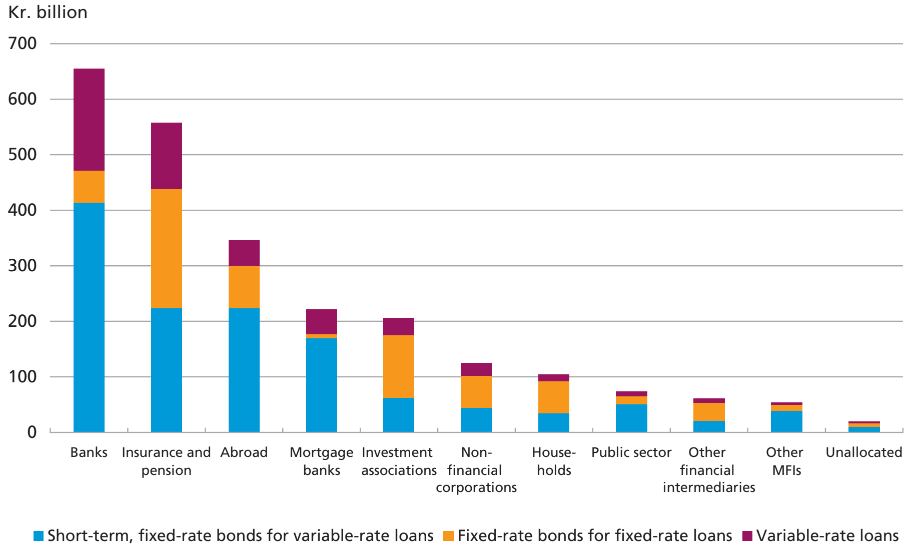
Investor base

The two dominant investor types are Danish banks and the insurance and pension sector, cf. Chart 6. Holdings of Danish mortgage bonds abroad total 14 per cent, and the demand thus stems primarily from a large Danish investor base. Mortgage bonds form an integral part of the financial system in Denmark. Banks, for instance, often use short-term mortgage bonds in their liquidity management and hold almost one third of all issued bonds underlying adjustable-rate mortgages. The insurance and pension sector as well as investment associations are the two largest investor segments for long-term, fixed-rate, callable bonds. The pension companies typically use the bonds for hedging the duration of their liabilities. The third largest domestic investor base is made up of mortgage banks, which to a large extent hold their own bonds.

Liquidity-supporting conditions

Liquidity in the Danish mortgage bond market is underpinned by mainly issuing in large series. Bond series of more than kr. 10 billion account for 59 per cent of the total outstanding volume, cf. Chart 7. Another 29 per cent of the total outstanding volume comprises issues of kr. 2-10 billion.

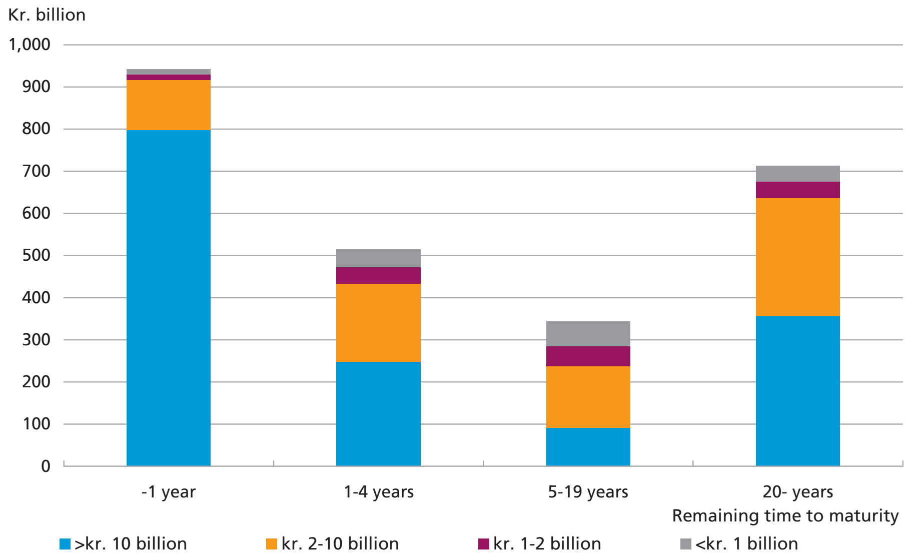
HOLDINGS OF MORTGAGE BONDS BY INVESTOR TYPE Chart 6



Note: Stated at market value at end-October 2011. The insurance and pension sector includes investment associations which administer pension funds.
Source: Danmarks Nationalbank.

To obtain large series, the mortgage banks seek to use the same series as the basis for many loans. When adjustable-rate mortgages are refinanced, existing series are reused to the largest possible extent, so that

TOTAL OUTSTANDING VOLUME BY REMAINING TIME TO MATURITY AND SIZE OF SERIES Chart 7



Note: Stated by market value at end-October 2011.
Source: Danmarks Nationalbank.

MARKET MAKING IN THE DANISH MORTGAGE-CREDIT MARKET Box 2

A market making agreement between market participants can help to support liquidity in the market by laying down requirements for the participants' price spreads and transaction sizes. Until 2008, market making in the Danish mortgage-credit market was based on quotation in bonds. In connection with the financial crisis in 2008, the market maker arrangement for long-term, callable mortgage bonds was suspended, while the arrangement for short-term mortgage bonds continued. As the market normalised, the market makers decided to work towards establishing market making in futures rather than resuming market making in long-term mortgage bonds. In October 2009, a futures contract on long-term mortgage bonds was introduced, and from the beginning market making in the futures contract was established. The positive experience from the futures contract on long-term mortgage bonds led the participants to establish a futures contract on medium-term mortgage bonds in November 2010. Market making was also established in this futures contract from the beginning.

The market maker arrangements in both futures remain in force as well as supplement market making in fixed-rate bonds with maturities of up to one year.

e.g. refinancing of a 1-year adjustable-rate mortgage loan is based on the bond used for refinancing 2-year adjustable-rate mortgages in the previous year.

Loans based on fixed-rate, callable bonds are granted on the basis of the same bond for up to 3 years. The remaining time to maturity of the bonds is approximately 33 years the first time it is issued, and the bond is open for 3 years until the remaining time to maturity has declined to 30 years.[1]

The average life of a mortgage-credit loan is 5 to 10 years, although the term stated in loan agreements is usually significantly longer. The reason is that a new loan is typically taken out when a home is sold and that many borrowers also remortgage before the end of the agreed term. Fixed-rate loans are typically callable, and if interest rates decline significantly, the borrower can profit from repaying the loan and taking out a new one. Remortgaging will often result in loans based on a more recent bond series. Investors benefit from the market activity ensuing from the ongoing borrowing and debt management.

The close similarity between the mortgage banks' loan products and hence between bonds issued by different mortgage banks also contributes to a more flexible mortgage-credit system. A certain substitution effect is obtained between otherwise identical bonds from different mortgage banks. At the same time, the market valuation of a highly liquid bond can contribute to simplifying the valuation of a similar, but smaller issue.

The existence of a relatively new futures market underpins the possibilities of hedging and thus the negotiability of the bonds, cf. Box 2. It is

[1] A bond series is only open for loan offers if the price of the bond is below par. The reason is that the borrower can redeem the loan at par.

possible to trade futures on medium-term, fixed-rate bonds underlying adjustable-rate mortgages, and on long-term, callable bonds.

Moreover, there is a repo market for Danish mortgage bonds, and these bonds are widely used as collateral for loans between professional investors, cf. Mindested et al. (2011). Around one third of all activity in the repo market is based on demand for specific securities, which e.g. makes it possible for recipients to sell mortgage bonds that they do not hold.

LOW CREDIT RISK

The significance of Danish mortgage credit entails that the sector attracts significant attention and that all relevant aspects of the mortgage-credit system are subject to financial regulation. The mortgage banks are specialised institutions holding specific licences and their main activity is to provide loans collateralised against real property and financed by issuing bonds. The largest Danish mortgage bonds are part of groups that also include banks. Groups are subject to rules regarding intra-group exposures, intended to limit the risk of contagion between group companies.[1] Like banks, mortgage banks must meet e.g. capital requirements as well as organisation and management requirements. Furthermore, the mortgage banks are subject to a number of specific rules on risk management, bond issuance, property valuation, registration of the collateral and liabilities, etc.

Five factors in particular ensure that mortgage bond investment is associated with very low credit risk and households and firms thereby have access to cheap financing of real property. First, the balance principle and the close link between loans and bonds mean that mortgage banks do not assume significant market risks. Second, the credit risk that the mortgage banks can assume is limited by fixed loan-to-value ratios and rules on valuation of the collateral. Third, they can strengthen their capital base on an ongoing basis by generally increasing their administration margins. Fourth, due to a strong legal framework they have reliable access to fast realisation of the collateral relating to a non-performing loan. Fifth, mortgage bond investors may file a claim against the mortgage bank and, in the event of compulsory liquidation, they

[1] Nykredit Realkredit and BRFkredit both have subsidiary banks, while Realkredit Danmark and Nordea Kredit are subsidiaries of Danske Bank and Nordea Bank Danmark, respectively. According to the rules on intra-group exposures, a financial corporation may not without prior permission from the Danish Financial Supervisory Authority have exposures to other companies within the same group, except for exposures to subsidiaries. This means that no intra-group exposures may be established between a parent company and its subsidiary without prior permission from the Danish Financial Supervisory Authority.

have priority over other investors in relation to the underlying collateral. Key elements of the regulation are outlined below.

The balance principle and match funding

The Danish mortgage-credit system is characterised by mortgage banks that assume only minor risks other than credit risk. This is attributable to the statutory balance principle, which sets the limits for the financial risks that mortgage banks can assume, including interest-rate, option, liquidity and exchange-rate risk. The balance principle is laid down in an executive order, and the Danish Financial Supervisory Authority supervises the mortgage banks' compliance with this principle.

Following the amendment of the Capital Requirements Directive in 2007, new legislation was passed in Denmark, enabling the mortgage banks to issue bonds with SDO status. These bonds meet pan-European rules and can qualify for a lower risk weighting than bonds without this status.

As a consequence of the legislative amendment, a new variant of the balance principle was introduced, the *general balance principle*. At the same time, the existing balance principle was, after minor adjustments, maintained as the *specific balance principle*.

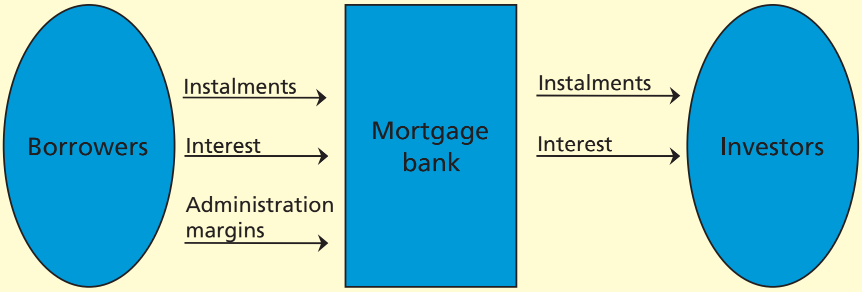
Both balance principles impose strict limits on the relationship between payment flows for loans and their funding. The general balance principle allows a larger deviation between payment flows for loans and the bonds issued because the difference can be hedged by derivative instruments. The two balance principles also differ in the methods applied to calculate risk. The mortgage banks must decide whether they want to apply the specific balance principle or the general balance principle, and the balance principle chosen must be stated in the prospectus for the bonds issued. In principle, a mortgage bank can apply different balance principles in different capital centres, but in practice they have all decided to apply one balance principle. The specific balance principle is applied by five mortgage banks, while the general balance principle is applied by two mortgage banks. In practice, however, all mortgage banks are managed within the framework of the specific balance principle because all mortgage banks apply match funding.

Match funding means that there is a direct link between the mortgage banks' lending and the bonds issued, implying that the fixing of interest rates and the prepayment options for the loan depend directly on the bonds issued, cf. Box 3. Therefore, the mortgage banks' choice of balance principle is of no practical significance to the market risk they assume when financing loans. Match funding is not a legal requirement, MATCH FUNDING Box 3

In the Danish mortgage-credit system, all loans are in principle financed by issuing one or more specific mortgage bonds, implying that the cash flows (the sum of interest and instalments) on the loan and the bonds are identical, cf. Chart 8. This means that the net payment flows between the borrower and the mortgage bank on the one hand and between the mortgage bank and the investors on the other hand are matched throughout the duration of the loan. In addition, the borrower pays a margin to the mortgage bank for administration and for building up the capital base.

In this context, loans to be refinanced do not differ from loans that are not refinanced. The calculation of the future payment flows assumes that all refinancing takes place, and the interest to be paid on adjustable-rate mortgages is fixed as the effective yield on the bonds sold.

ILLUSTRATION OF PAYMENT FLOWS AFTER LOAN ORIGINATION Chart 8



As a general rule, the loan agreement allows the borrower to redeem a loan, fully or in part, at any time at the market rate by delivering the underlying bonds to the mortgage bank. In practice, the mortgage bank will typically buy the bonds for redemption on behalf of the borrower. Mortgage bonds are quoted on Nasdaq OMX, which gives the borrower access to information about current prices.

Furthermore, a callable loan can be redeemed, at the borrower's request, at the redemption price (typically par, although typically 105 for capped variable-rate loans). This takes place via mathematical drawing, distributing the redemption proportionately between investors.

but a practice developed by the sector. This practice is reflected in the link between bond issues and the agreements concluded between the mortgage banks and borrowers.

Due to the direct link, all mortgage loans can be redeemed at market price if the borrower repurchases the underlying bonds. With match funding, the mortgage bank avoids two significant risks. First, the interest-rate risk is assumed by the borrower as the borrower's interest rate reflects the yield on the bond financing the loan. Second, the investor assumes the risk that borrowers exercise their prepayment option for callable loans.

Refinancing risk on adjustable-rate mortgage loans

Adjustable-rate mortgages are financed by bonds with maturities of 1 to 10 years, while the term of the loan is up to 30 years. This means that the mortgage bank will have to refinance the adjustable-rate mortgage throughout the term of the loan. When loans are refinanced, the mortgage bank issues new bonds. In this case, match funding implies that the interest rate on the loan until the next refinancing is determined by the yield on the new bonds, and as a result the payments on the loan correspond to payments on a series of short-term bonds.

Match funding ensures that the mortgage bank is initially protected against risks in connection with the refinancing. However, the financial crisis has brought examples of otherwise well-functioning markets that have suddenly ceased to function.

Financial turmoil and general uncertainty can also cause the interest rate to be much higher at the time of refinancing. Initially, this risk is assumed by the borrowers, but over time the consequence may be that many borrowers would have difficulty servicing their debt, resulting in higher credit risk for the mortgage bank.

If these risks materialise for many loans at the same time, this may lead to financial instability. The likelihood is very small, but the consequences are potentially serious. The mortgage banks' efforts to reduce this risk by spreading the refinancing are described in detail at the end of this article.

Mortgage banks' credit risk

In practice, the balance principle means that the most significant risk for the mortgage banks is the credit risk on lending. Mortgage-credit loans are held on the mortgage banks' balance sheets, and the borrowers are subject to credit assessments. Credit assessments of customers and valuation of the mortgaged property can be carried out by the mortgage bank itself or on behalf of the mortgage bank by e.g. intra-group or partner institutions in accordance with prior instructions and with subsequent ongoing control. A loss guarantee or the like will often be provided by the intra-group or partner institution. These conditions give the institutions incentive to ensure that the loans have a high credit quality.

Loans can only be granted against collateral in the form of real property, and the requirements for the collateral underlying the loans, including loan-to-value ratios, valuation, etc., are laid down by statute. The maximum loan-to-value ratios are between 40 and 80 per cent of the value of the mortgaged property, depending on the type of property, cf. Table 2.

LOAN-TO-VALUE RATIOS FOR DANISH MORTGAGE BONDS Table 2

Loan purpose	Loan-to-value ratios, per cent
Owner-occupied housing, etc.[1]	80
Commercial properties, etc.[2]	60[3]
Summer cottages	60
Undeveloped sites	40

Source: Consolidated Danish Mortgage-Credit Loans and Mortgage-Credit Bonds etc. Act.

1 The same loan-to-value ratio applies to private residential letting and private cooperative housing. However, special rules apply to new construction and establishment of social housing in existing properties.

2 Commercial properties, etc. comprise office and retail property as well as industrial and crafts property. For loans to agricultural and forestry property as well as market gardens, the maximum loan-to-value ratio is 70 per cent.

3 The loan-to-value ratio can be increased to 70 per cent for SDOs if top-up collateral is provided for at least 10 per cent of the part of the loan exceeding 60 per cent of the property value.

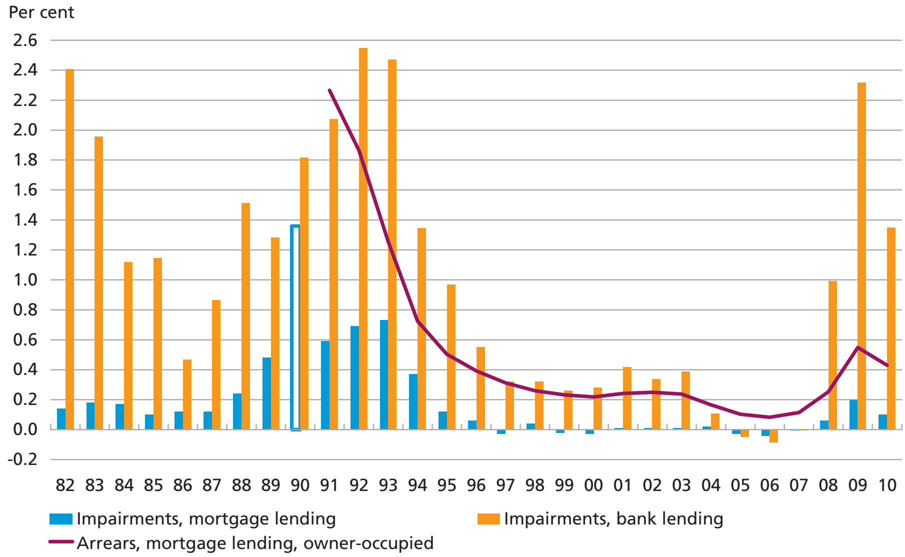
The valuation of the property may not exceed the market value. Hence, it cannot be based on the most recently traded price if this price is not assessed to be a realistic market price. If independent parties have concluded a transaction within the past six months, this traded price constitutes an upper limit for the valuation providing the basis for the loan granted.

All matters concerning property rights are entered into public registers, which underpins the mortgage banks' rights.[1] If a borrower defaults on a loan, the banks hold a strong position in terms of collecting the debt. The mortgage bank can call the loan and sell the mortgaged property as cover for its claim. The period from default on a loan until the mortgage bank may have sold the property is typically less than nine months. The relatively short period helps limit the mortgage bank's potential loss. If the mortgage bank's claim is not met, it retains a claim on the borrower. Consequently, the Danish mortgage-credit system gives the borrowers strong incentives to service their loans and avoid enforced sales.

The rules governing mortgage banks and borrowers are probably a key factor behind the low impairments on loans for many years, cf. Chart 9. The rules applying to valuation of collateral, loan-to-value ratios, fast access to enforced sales if the borrower defaults on loans as well as the borrower's personal liability all contribute to reducing the credit risk. During the prolonged economic slowdown in the early 1990s, impairments reached 0.6-0.8 per cent annually, but since then they have been considerably lower. Low interest rates and low unemployment, particularly in recent years, have probably contributed further to the low level of impairments. The more widespread use of variable-rate

1 The cadastral register under the National Survey and Cadastre identifies all sites and buildings in Denmark, and the Land Registry includes a complete list of title and charges related to real property.

IMPAIRMENTS AND ARREARS AS PERCENTAGES OF LENDING | Chart 9



Note: The mortgage banks' write-downs are stated as percentages of loans and guarantees. In 1990, the principles for impairments (losses and provisions) for mortgage banks were changed, so that provisions for probable losses were recognised according to a prudence concept and not only made for certain losses. In principle, part of the provisions in 1990 therefore concern previous years. Negative figures for impairments indicate that previous provisions are reversed as income. In 2005, the reversals for mortgage banks and banks partly include adjustments to new accounting principles as from 2005.

Source: Danmarks Nationalbank and Association of Danish Mortgage Banks.

loans has contributed to a relatively fast impact of the interest-rate decline. During the financial crisis, impairments reached a level of 0.2 per cent in 2009, from which they have subsequently declined. They have thus been very low, even though property prices are now lower than in 2007, with a higher risk of loss in the event of default as a consequence. The development in impairments on bank loans has followed the same pattern, albeit at a much higher level, which reflects the difference in the risk associated with loans in the two types of institution.

Mortgage banks' protection against losses

The mortgage bank's income from lending primarily consists of the administration margin paid on the loan on an ongoing basis. Additional income is generated by spreads and fees for establishing and remortgaging when loans are granted or changed. The income must cover the mortgage bank's costs and ensure an adequate capital base. The administration margin is usually calculated as a fixed share of the outstanding debt on the loan and is charged separately by the mortgage bank in addition to interest and instalments.

The mortgage banks can generally change the administration margin to be paid by borrowers. The loan agreement must state the conditions that can lead to a change – e.g. higher costs.[1] The administration margin is the primary cost that the mortgage banks charge from borrowers and is therefore an important parameter for competition. The mortgage banks' choice of administration margins will therefore be a trade-off between the need to increase income and the potential competitive disadvantage. In 2009, several mortgage banks increased their administration margins for corporate loans. Since 2010, all mortgage banks granting loans to retail customers have also increased or announced increases of their administration margins for these loans as a consequence of rising costs, cf. Box 4.

According to the capital adequacy rules, mortgage banks must as a minimum hold a total capital corresponding to 8 per cent of risk-weighted items, i.e. the mortgage bank's assets in the form of e.g. loans and securities weighted according to risk. In addition, individual capital needs are laid down for each mortgage bank, taking the mortgage bank's specific risks into account. If an individual capital need is higher than the minimum solvency requirement, it constitutes the capital requirement of the mortgage bank, which must be met at all times.

At end-June 2011, the mortgage banks' total capital constituted between 12.3 and 34.9 per cent of risk-weighted items.[2] In the assessment of the capitalisation, the possibility for mortgage banks to raise their administration margins should be taken into consideration.

Investor security

Investors' claims on the mortgage bank are secured in the mortgage bank's lending with real property as collateral. In the event of compulsory liquidation, investors have priority over unsecured creditors in both the capital centre and subsequently, if relevant, in the estate in liquidation. The collateral is linked to the bonds in capital centres, which

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[1] On the merger with Totalkredit, Nykredit made a number of commitments to the Danish Competition and Consumer Authority. Consequently, Nykredit can only raise administration margins for loans to retail customers by agreement with the Competition and Consumer Authority. On 30 November 2011, the Danish Competition Council decided that, for a 5-year period starting from 1 April 2012, Nykredit will have the possibility of raising the administration margin from 50 to 55 basis points for fixed-rate loans with amortisation and from 50 to 60 basis points for other loans (calculated when fully mortgaged). Nykredit has not made any commitments concerning administration margins on loans granted via Totalkredit. Nykredit has decided to bring the issue of whether the commitment applies indefinitely before the Maritime and Commercial Court, where the case is pending decision.

[2] Calculated for the Nykredit Realkredit group (including Totalkredit and Nykredit Bank), Realkredit Danmark, Nordea Kredit, BRFkredit (including BRFkredit Bank) and DLR Kredit. The first four mortgage banks have obtained approval for applying the internal ratings-based approach to calculation of risk-weighted items, and are comprised by a transitional scheme, according to which they have to meet an increased capital requirement. Including the requirements of the transitional scheme, the excess capital adequacy is 5.2, 16.0, 2.2, 6.3 and 4.3 per cent, respectively. When assessing the mortgage banks' excess cover, it should be taken into account that some of them are part of large financial groups and therefore may have access to further capital from their parent companies.

ADMINISTRATION MARGINS Box 4

Administration margins for loans to retail customers are published by the mortgage banks, while they are usually negotiated individually with corporate customers. The administration margins applying to retail customers are differentiated according to the loan-to-value ratio and possibly loan type. The lowest administration margins are obtained for low loan-to-value ratios (typically less than 40 per cent of the value of the mortgaged property). Several mortgage banks have increased their administration margins in recent years, particularly for adjustable-rate mortgages and deferred-amortisation loans, and further increases have been announced, cf. Table 3. With the announced increases, the total administration margin at the maximum loan-to-value ratio will have been raised by up to 22 basis points since early 2010, depending on the loan type. Add to this that several mortgage banks have introduced a spread corresponding to around 5 basis points on refinancing of adjustable-rate mortgages. The new administration margins vary more, reflecting the loan-to-value ratio. Previously, borrowers often paid the same marginal administration margins for the entire 40-80 per cent range, while the new margins often differ for the 40-60 per cent and 60-80 per cent ranges, cf. Table 4.

AVERAGE ADMINISTRATION MARGINS FOR OWNER-OCCUPIED HOUSING BY LOAN-TO-VALUE RATIO AND LOAN TYPE Table 3

Average administration margin in basis points by loan-to-value ratio	Nykredit/ Totalkredit		Realkredit Danmark[1]		Nordea Kredit		BRFkredit	
	0-40	0-80	0-40	0-80	0-40	0-80	0-40	0-80
Margins, early 2010								
All loans	30.0	50.0	30.0	57.5	30.0	52.5	37.5	55.0
Most recently announced margins								
Fixed-rate, with amortisation	35.0	61.3	37.5	65.0	37.0	59.5	37.5	67.5
ARM, with amortisation	40.0	66.3	45.0	72.5	44.4	71.4	42.5	72.5
ARM, without amortisation	45.0	71.3	47.5	75.0	46.3	74.4	42.5	72.5

Note: The table comprises the mortgage banks' announcements up to and including November 2011. BRFkredit's most recent administration margins have been in force since March 2011. The new administration margins for Realkredit Danmark and Nordea Kredit apply from January 2012, while the new administration margins for Nykredit/Totalkredit will apply from April 2012. These margins will apply to new loans taken out via Totalkredit. On 30 November 2011, the Danish Competition Council decided that Nykredit, for a five-year period from 1 April 2012, will be allowed to increase the administration margin from 50 to 55 basis points for fixed-rate loans with amortisation and from 50 to 60 basis points for other loans. From 2012, Realkredit Danmark and Nordea will introduce a spread of 0.05 point on refinancing of adjustable-rate mortgages. In the case of annual refinancing at par, this corresponds to annual costs of 5 basis points. The administration margins stated do not reflect the spreads and other fees.

Source: Nykredit Realkredit, Realkredit Danmark, Nordea Kredit and BRFkredit.

[1] Realkredit Danmark's most recently announced administration margin is 5 basis points lower if the borrower makes monthly rather than quarterly payments, which most borrowers in Realkredit Danmark do.

are separated from the estate in liquidation in the event of compulsory liquidation. Each capital centre must meet the statutory capital adequacy requirement of 8 per cent of risk-weighted assets. It is a legal requirement that funds from the individual capital centre must be used

ADMINISTRATION MARGINS – CONTINUED Box 4

The mortgage banks have cited increased costs and stricter requirements for the collateral as the reasons for the increases. After 2007, impairments have risen, and house price declines have increased the mortgage banks' need to provide top-up collateral for loans if the underlying collateral no longer meets the maximum loan-to-value ratio.

Moreover, credit rating agencies have tightened conditions for maintaining their ratings on mortgage bonds. Among other things, this has led to a stronger need for overcapitalisation. Overcapitalisation implies that collateral for the bonds issued exceeds the statutory requirement. The tightened conditions were partly a result of one of the credit rating agencies attaching more weight to the refinancing risk on adjustable-rate mortgages than previously. Furthermore, the tightening was based on the mortgage banks' expected future earnings and expectations of rising costs for collateral in the capital centres.

MARGINAL ADMINISTRATION MARGINS FOR OWNER-OCCUPIED HOUSING BY LOAN-TO-VALUE RATIO AND LOAN TYPE Table 4

Marginal administration margins in basis points by loan-to-value ratio	Nykredit/ Totalkredit		Realkredit Danmark[1]		Nordea Kredit		BRFkredit	
	59-60	79-80	59-60	79-80	59-60	79-80	59-60	79-80
Margins, early 2010								
All loans	70.0	70.0	85.0	85.0	90.0	90.0	50.0	95.0
Most recently announced margins								
Fixed-rate, with amortisation	75.0	100.0	92.5	92.5	97.0	97.0	80.0	115.0
ARM, with amortisation	80.0	105.0	100.0	100.0	116.4	116.4	85.0	120.0
ARM, without amortisation	85.0	110.0	102.5	102.5	121.3	121.3	85.0	120.0

Note: In the 0-40 per cent range, the average and the marginal administration margins are identical. See also the note to Table 3.
Source: Nykredit Realkredit, Realkredit Danmark, Nordea Kredit and BRFkredit.
[1] Realkredit Danmark's most recently announced administration margin is 5 basis points lower if the borrower makes monthly rather than quarterly payments, which most borrowers in Realkredit Danmark do.

for meeting claims from the holders of mortgage bonds in the event of compulsory liquidation, cf. Box 5.

In this situation, the mortgage bank's capital centres are separated from the estate in liquidation. The administrator of the estate can continue the operation of the capital centres and is legally obliged and has extensive authority to meet the mortgage bank's obligations to bond holders and counterparties to financial instruments. Whenever possible, the administrator must ensure that the creditors receive timely payments, although it must be ensured that all creditors are treated equally. As the capital centre is being wound down, the administrator will not be able to originate new loans. The borrower's rights remain unchanged, meaning

CAPITAL CENTRES Box 5

The statutory framework for administration of capital centres offers bond holders a high degree of protection against losses in the event of compulsory liquidation of the issuer.

Today, new issuance of mortgage bonds is almost entirely done from the capital centres, as this is a statutory requirement for mortgage bonds with SDO status. In the capital centres, the bonds issued and the loans granted are matched, and the capital centres must also hold adequate capital to meet the 8 per cent capital adequacy requirement. The mortgage banks must, on an ongoing basis, ensure that the capital centre holds sufficient capital and must increase the capital in the capital centre, if necessary.

Moreover, the mortgage bank must provide sufficient top-up collateral in the SDO capital centres if e.g. the market value of the properties declines, or the market value of the SDOs increases so much that the loan-to-value ratio is exceeded for the individual loan. The mortgage bank can issue junior covered bonds for financing top-up collateral. The mortgage bank can also decide to add more assets to the capital centres for other reasons. The purpose might be to obtain a specific rating for a capital centre.

The rules on compulsory liquidation laid down in the mortgage-credit legislation have never been applied. If the situation should arise that payments are suspended or an insolvency order is issued against a mortgage bank, e.g. if the capital adequacy requirement has not been met, funds cannot subsequently be transferred from the capital centres to the mortgage bank. In the event of compulsory liquidation, the funds in the individual capital centre – after deduction of expenses for the administration of the estate in liquidation, etc. – are used for meeting claims from the mortgage bond holders and counterparties to financial instruments applied in the risk management. Then claims are met from any holders of junior covered bonds issued by the mortgage bank in connection with a capital centre to be able to provide top-up collateral. Surplus funds are transferred to the remaining part of the mortgage bank.

For the part of the mortgage bank not structured as a capital centre, the funds of the mortgage bank are distributed in the same order as those of the capital centres. If a capital centre lacks funds to meet the claims from mortgage bond holders, they have priority over unsecured creditors in the estate. Subsequently, other claims are paid in equal proportion.

that the loan cannot be cancelled by the mortgage bank/capital centre, whereas the borrower is free to redeem the loan.

SDO capital centres provide added security, as the mortgage bank has had to pledge top-up collateral for each loan exceeding the maximum loan-to-value ratio on an ongoing basis. This means that the bonds have a high credit quality even after the compulsory liquidation of the mortgage bank.

As bonds and loans are issued according to the match funding principle, interest and instalment payments on the loans will correspond to interest and instalment payments on the bonds, except for bonds maturing before the loan, which the administrator would have to replace via refinancing. However, refinancing requires that funds for the creditors are expected to be sufficient after the issuance. Moreover, the administrator charges administration margins and can legally raise the administration margin if this is warranted by market conditions, and a need for further funds for the administration of the estate in liquidation has been ascertained. The capital centre can, if need be, be wound down over e.g. 30 years as the last loan agreement expires.

On approval by the appointed supervisor, the administrator can sell part of the capital centre to another mortgage bank. The extensive authority to continue operation of the capital centre ensures that the administrator has ample time to sell the capital centre and is not forced to realise assets quickly. At the same time, the administrator will, in so far as this is possible, seek to meet bond holders' claims. The value of the ongoing administration margin income on loans and other mortgage banks' possibility of acquiring a larger market share increase the likelihood that a capital centre is sold.

PERSPECTIVES

Like the rest of Europe, Denmark has been hit by the international economic slowdown, but the Danish economy is more resilient than those of other countries in several respects. This has probably contributed to the stable value and high negotiability of Danish mortgage bonds in recent months. These are characteristics of assets considered to have safe-haven status during periods of financial turmoil. This development would not have taken place if Danish mortgage bonds had not been regarded by investors as being among the safest assets, with low credit risk and high liquidity.

Confidence in the Danish mortgage-credit sector is important to the Danish economy. Following the financial crisis, the requirements for safe assets have increased. The background is that the financial crisis has unveiled a number of risks, including liquidity and refinancing risk. Add to this the economic repercussions of the financial crisis and the general uncertainty resulting from the sovereign debt crisis.

Danmarks Nationalbank has previously pointed out both the refinancing risk associated with adjustable-rate mortgage loans and the risk of a large need for top-up collateral in the event of sharp house price declines, cf. Danmarks Nationalbank (2011). The risks should be viewed in light of the important role of mortgage credit in the financial system in Denmark. Even a modest risk that the mentioned risks materialise should therefore be addressed. The mortgage banks are aware of the risks and have taken initiatives aimed at ensuring a sustainable system also in the future.

Initially, the mortgage banks have begun to spread the refinancing of adjustable-rate mortgages over the year with a view to reducing the refinancing risk. It has turned out to take a long time to spread the refinancing need, as the process of agreeing a different time of the year to refinance individual loans is very sluggish.

The work of ensuring a sustainable mortgage-credit system also includes changes in the mortgage banks' business models, including the phasing-in of new issuance structures with capital centres with different risk profiles. Some mortgage banks will place loans with refinancing risk, primarily adjustable-rate mortgages, in separate capital centres. Thus, the risk associated with refinancing will to a higher degree be reflected in loan costs. Differentiated administration margins, whereby the mortgage banks charge higher fees for loans associated with higher risk for the mortgage bank, may also contribute to appropriate price differentiation. These changes may give borrowers an incentive to take out loans with a lower refinancing risk. A single mortgage bank wishes to introduce a two-tier mortgage system, where loans against the first part of the collateral are financed by issuance from a capital centre issuing bonds with SDO status, while the top part of the loan is financed in a capital centre issuing bonds without SDO status. Two-tier mortgaging will lead to a reduction in the potential need for top-up collateral over time.

Looking ahead, the sector's framework conditions should also be reviewed. As mentioned above, the Danish economy is more resilient than other economies in several respects. The large gross balance sheets of the households – mainly comprising mortgage-credit loans on the liabilities side – increase the interest-rate sensitivity. Therefore, low deficits, sustainable public finances and robust current-account surpluses are essential framework conditions, also for household finances.

With more stable house prices, the economy would be even stronger. Danmarks Nationalbank has previously pointed out that fluctuations in the housing market could be curbed by restoring the link between property value tax and current house prices and by phasing out the access to deferred-amortisation loans for owner-occupied housing, cf. Dam et al. (2011). Another way of reducing future house price fluctuations could be to change the principles for valuation of property or the fixing of loan-to-value ratios, so that mortgaging options are limited in periods of sharp increases in house prices. The alternative to a more stable housing market could be to establish a larger, fixed safety margin against house price fluctuations, possibly by lowering the maximum loan-to-value ratio.

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