DANMARKS
NATIONALBANK

FINANCIAL STABILITY
2ND HALF

2015

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Financial stability is available on Danmarks Nationalbank's website: www.nationalbanken.dk under publications.

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Explanation of symbols:
- - Magnitude nil
- 0 Less than one half of unit employed
- • Category not applicable
- na. Numbers not available

Details may not add due to rounding.

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APPENDIX

FOREWORD

Under the 1936 Danmarks Nationalbank Act, Danmarks Nationalbank must maintain a safe and secure currency system and facilitate and regulate the traffic in money and the extension of credit. One of Danmarks Nationalbank's main objectives is thus to contribute to the stability of the financial system.

Danmarks Nationalbank defines financial stability as a condition whereby the overall financial system is robust enough for any problems within the sector not to spread and prevent the financial system from functioning as an efficient provider of capital and financial services.

In its *Financial stability* publication, Danmarks Nationalbank assesses financial stability in Denmark and presents its views and recommendations on measures that may contribute to enhancing financial stability. Furthermore, the publication is intended to stimulate debate about topics of relevance to financial stability and provide input for public authorities, individual financial institutions and financial sector organisations in relation to risk-assessment issues.

1

SUMMARY AND ASSESSMENT

In the 1st half of 2015 Danish credit institutions overall posted the highest profit since the financial crisis, despite low demand for new loans and a historically low level of interest rates. This was attributable to factors such as higher fee income due to an increase in the volume of remortgaging. In addition, impairment charges on bank loans were lower, and for 2015 as a whole, loan impairment ratios are set to be substantially lower than in previous years. This should be viewed in the light of an improved economic situation and rising values of the properties pledged as collateral for many of the loans.

The financial statements of the systemic groups for the 3rd quarter of 2015 show that their earnings have not continued to rise. One reason is that fee income from remortgaging has declined, while net interest income is still squeezed by the low level of interest rates and subdued demand for new loans.

The subdued demand for new loans should be viewed in the context of a high level of lending, which has not fallen in recent years despite a sharp rise in the pre-crisis years. Against this background it is important that the credit institutions do not lower their credit standards in order to boost business volumes. It could give cause for concern that some medium-sized banks have stated, in Danmarks Nationalbank's lending survey in recent quarters, that they have eased credit standards.

THE BANKS HAVE AMPLE LIQUIDITY

On balance, Danish banks have customer funding surpluses and ample liquidity. In October 2015 the European Liquidity Coverage Ratio, LCR, requirement entered into force. The systemic groups observed the requirement with a substantial margin relative to the minimum of 100 per cent. The non-systemic banks[1] also had an LCR of more than 100 per cent, although their minimum requirement is currently 60 per cent, rising to 100 per cent by 2018. Excess cover relative to the minimum requirement is expedient as the LCR fluctuates over time.

THE SYSTEMIC GROUPS HAVE SUBSTANTIAL EXCESS CAPITAL ADEQUACY RELATIVE TO THE MINIMUM REQUIREMENTS

All the systemic groups have substantial excess capital adequacy relative to the current requirements. This helps to ensure their robustness.

The capital requirements will be tightened in the coming years. This will be achieved by phasing in a capital conservation buffer and in the case of the systemic groups also a SIFI capital buffer. Although the buffer requirements will not be fully phased-in until 2019, all systemic groups observed these requirements at the end of the 1st half of 2015. But some systemic groups may need to increase their capitalisation in the coming years if the countercyclical buffer is increased from the current 0 per cent.

Danmarks Nationalbank performs semi-annual stress tests of the banks' capitalisation in various macroeconomic scenarios. The stress test shows that the five systemic banks all have considerable excess capital adequacy in relation to the minimum requirements until 2017, which is as far as the projection goes. This also applies in a scenar-

1 The group of non-systemic banks is denfined in Appendix 1.

io with a severe recession. The stress test is based on the banks' financial statements. The results are supported by a supplementary market-based stress test, which relies, inter alia, on the listed banking groups' equity prices, thereby utilising the market's forward-looking assessments of the groups' capitalisation.

Danmarks Nationalbank's stress test also shows the excess cover relative to the capital buffer requirements. The rising requirements entail that the excess cover will decrease and a few systemic institutions will have a capital requirement by 2017. It is uncertain how negatively investors will respond if a systemic institution does not observe the capital buffer requirements. Their reaction may have a major impact as the systemic institutions rely on continuous access to funding in the financial markets.

HOUSEHOLD DEBT IS HIGH, BUT CURRENTLY NO THREAT TO FINANCIAL STABILITY

Danish households have high debt, predominantly at variable rates of interest. This means that changes in interest rates have a considerable impact on households' interest payments and hence on their disposable incomes. However, the vast majority of families are financially resilient to a strong increase in interest rates. Over the last one and a half years, households have also moved towards loans with fixed rates of interest, which increases their robustness to higher interest rates.

Nevertheless, some families are particularly vulnerable as they have consistently high debt relative to both the value of their homes and their incomes. Credit institutions have lent more than kr. 200 billion to this group of homeowners, where 75 per cent of the families have mortgage loans at variable rates of interest. The risk of defaulting is higher for families with high debt relative to their incomes. If the loans cannot be serviced, the high loan relative to the value of the home increases the risk that the credit institutions will incur losses. However, this risk is reduced as most of the families with high debt ratios also have high incomes and large assets.

THE AGRICULTURAL SECTOR IS IN A CRISIS, BUT NO THREAT TO THE SOUNDNESS OF THE FINANCIAL SECTOR

The agricultural sector is burdened with large debt, and earnings have been squeezed by falling market prices in the last couple of years, although they are not extraordinarily low in a long-term perspective. At present, the sector is being buoyed up by very low interest rates. All the same, many farmers are operating at a loss and are struggling to service their loans. As a result, the banks' loan impairment ratios remain high for agricultural loans, while they have been declining for other industries.

The credit institutions should reckon with the possibility of a large increase in losses if interest rates rise substantially and market prices remain low. Furthermore, a number of farms will see their bottom lines turn red if they remortgage from variable rate into fixed rate loans. In other words, they cannot afford the loans that offer protection against future increases in short-term interest rates.

Especially the small, local banks have large exposures to the agricultural sector. Hence, they are particularly vulnerable to weakened repayment ability and lower prices for farms.

On the basis of Danmarks Nationalbank's stress test, further, and very high, loan impairment charges for agriculture are not assessed to pose a threat to the soundness of the financial sector overall.

LIQUIDITY CHALLENGED IN THE MARKET FOR MORTGAGE BONDS

Market participants and international organisations are becoming increasingly focused on market liquidity, especially in the bond markets. In Denmark, market participants are mainly concerned about falling and less resilient liquidity in the market for mortgage bonds.

Based on the analysis in chapter 3, the general level of liquidity in mortgage bonds is still assessed to be high.

However, since the end of 2014 volatility has been higher, indicating that liquidity has become less resilient. Consequently, smaller shocks than previously may cause liquidity to evaporate.

Banks play a pivotal role in providing liquidity in the bond market by absorbing imbalances between supply and demand through their market making activities. Market participants indicate that over recent years, market makers have become less willing to absorb these imbalances. This should be seen in the context that lower risk appetite and increased capital and liquidity regu-

lation after the financial crisis could induce banks to reduce their market making activities in the bond market. In the last year, Danish banks have reduced their holdings of mortgage bonds for market making, which supports this view.

The analysis also shows that the properties of mortgage bonds affect their liquidity.

For example, smaller series are assessed to be less liquid. This could mean that trade in the many small bond series may be challenged in a situation with declining market liquidity. At the same time, new liquidity requirements make it less attractive for credit institutions to hold bond series below a certain volume.

Liquidity resilience is also highly dependent on the creditworthiness of bonds. Internationally there are indications that liquidity is becoming more concentrated on few bond types with low credit risk. In such a situation it is essential that confidence in the system and the high creditworthiness of the bonds are maintained if the Danish mortgage credit market is to remain liquid.

NEW RECOVERY AND RESOLUTION REGIME PUTS AN END TO THE IMPLIED GOVERNMENT GUARANTEE FOR LARGE INSTITUTIONS

During the most recent financial crisis, a number of distressed European credit institutions were rescued by means of government funds. Government intervention was necessary in order to ensure continuation of financial system functions that are critical to the real economy and performed by systemically important institutions. Households, firms and authorities all depend on many of the services provided by the institutions. Insolvency whereby these critical functions are interrupted will have considerable negative consequences for financial stability and the real economy.

In the absence of a framework regulating the authorities' management of a distressed institution without such consequences, a number of governments had to intervene. This involved financial support to distressed institutions – and hence their owners and creditors, i.e. *bail-out*. However, bail-out is a costly solution entailing substantial risks for the government and an inappropriate incentive structure for the largest institutions.

The new EU framework on recovery and resolution of credit institutions, the BRRD, gives the resolution authorities a number of measures and tools enabling resolution of any institution irrespective of its size and functions. The fundamental principle is that those who have assumed the risks, i.e. the owners and creditors of the distressed institution, are to bear the losses to the extent that it is possible to restructure or resolve the institution without any significant adverse impact on financial stability and without using government funds. This is ensured by writing down or converting the claims of owners and creditors to the extent necessary, i.e. *bail-in*. However, for the mortgage banks, which are systemically important, it is not possible to use the bail-in tool in a resolution.

Part of the new framework still remains to be implemented. This relates to the authorities' resolution plans and determination of a requirement for the institutions to have sufficient liabilities that are eligible for absorbing losses in a resolution situation. This work is essential if the tools are to be available for the intended use, and thus also essential for a robust and credible resolution regime in practice. This is necessary in order to avoid future pressure on governments for bail-out of systemically important institutions.

There are a number of specific issues in relation to resolution of mortgage banks. Therefore, there is an important work to be done in order to clarify how to ensure that mortgage banks can be resolved in accordance with the resolution objectives.

2

DEVELOPMENT AND TRENDS

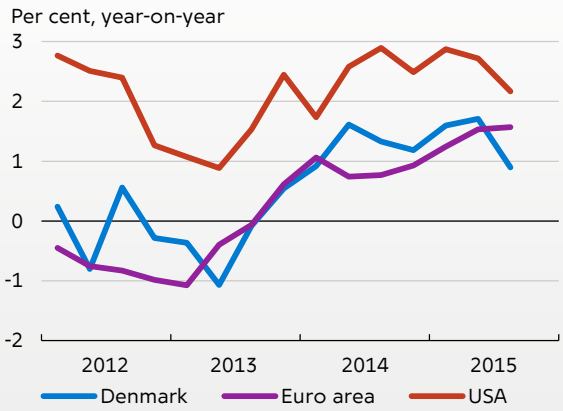
MACROECONOMIC AND FINANCIAL BACKGROUND

GROWTH IN THE GLOBAL ECONOMY

Among the advanced economies, the USA and the UK are in an upswing, but growth has declined slightly in the last couple of quarters, cf. Chart 2.1. In the euro area, GDP growth rates are a little lower. Growth has decreased in the emerging market economies, including in China, which in particular affects commodity-producing countries and China's neighbouring countries, while the impact is somewhat less pronounced for the advanced economies.

Activity in the advanced economies is driven by domestic demand. Activity is supported by e.g. low oil prices and the very low level of interest rates. The weakening of the nominal effective exchange rate also has a positive impact on exports in the euro area and Japan. Moreover, fiscal policy no longer has a dampening effect on activity in the euro area and the USA. This sets the stage for continued growth in 2016. However, the international organisations have adjusted their forecasts for global GDP development in 2015 and 2016 slightly downwards against the backdrop of the weaker activity growth in the emerging market economies. In the assessment of the OECD, slower growth in China has little impact on the advanced economies via direct trade relations, but it may have considerable effects if the slowdown gives rise to global financial turmoil.

Annual growth in real GDP Chart 2.1



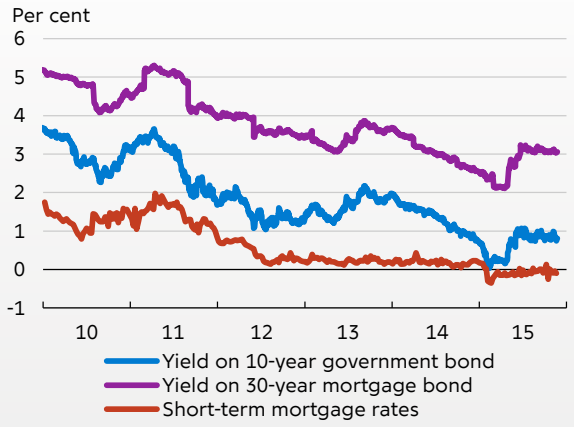
Note: Seasonally adjusted observations.
Source: Macrobond and OECD.

CONTINUED UPSWING IN THE DANISH ECONOMY

Falling oil prices and the weakening of the effective krone rate are boosting growth in the Danish economy. Interest rates also remain low, cf. Chart 2.2. At the same time, the labour market appears strong, with rising employment and falling unemployment. In Danmarks Nationalbank's projection, growth is expected to increase in the coming years, the challenge being to ensure a sufficient supply of labour.

Price inflation has been curbed by the fall in oil prices and is close to zero. Underlying inflation is around 1 per cent, and wage growth is accelerating.

Development in Danish interest rates Chart 2.2



Note: The 10-year government bond yield is the par yield, i.e. the calculated yield for a remaining maturity of exactly 10 years.
Source: Nordea Analytics, Association of Danish Mortgage Banks, Thomson Reuters EIKON and Nasdaq OMX.

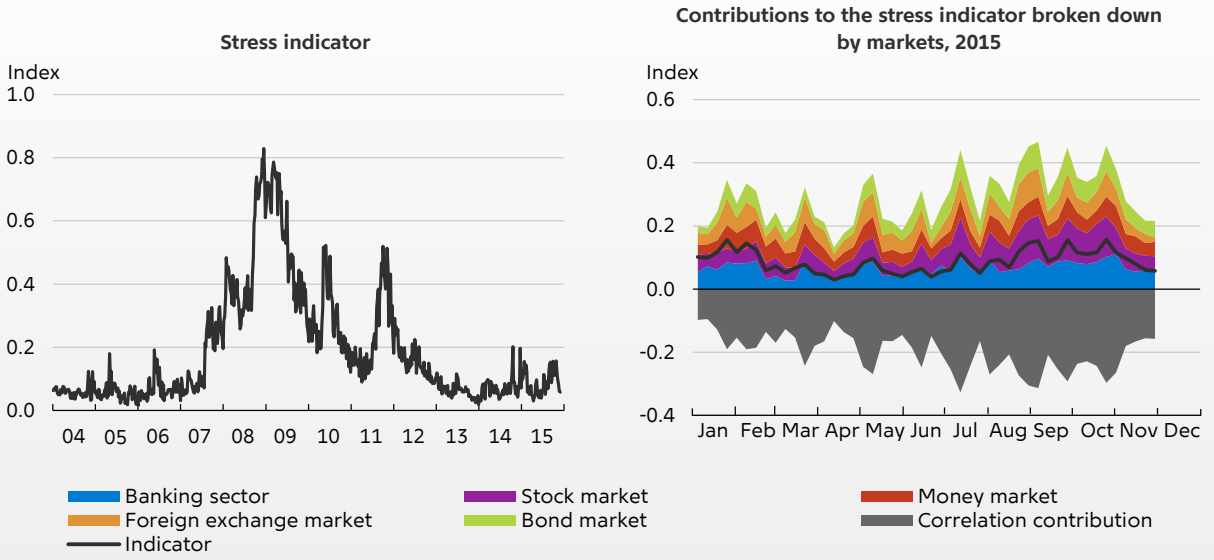
Developments in the housing market have been more subdued during the past half year after having accelerated in the 1st quarter. A rise in long-term interest rates since the beginning of the year thus seems to have dampened both activity and price increases. The trend is most pronounced for single-family houses and slightly less clear for owner-occupied flats, and monitoring is still needed, especially of the housing market in Copenhagen.

HIGHER LEVEL OF FINANCIAL STRESS IN THE SUMMER OF 2015

Fluctuations in the financial markets increased during the summer of 2015 in both Denmark and the euro area. In Denmark, this caused financial stress, which is primarily measured by fluctuations in the financial markets, to reach the same level as in the autumn of 2014, cf. Chart 2.3 (left), when considerable price fluctuations hit the equity markets etc.

Danmarks Nationalbank's composite financial stress indicator shows that the increase in the summer of 2015 was driven mainly by greater fluctuations in the equity, bond and foreign exchange markets, cf. Chart 2.3 (right). One reason was that in late June and early July it was uncertain how the sovereign debt situation in Greece would evolve. Furthermore, China influenced the financial markets as there were rising concerns about the growth outlook for China, the Chinese

Financial stress indicator for Denmark Chart 2.3



Note: Danmarks Nationalbank's financial stress indicator measures the current stress level and cannot be used for measuring build-up of systemic risk. The stress indicator has been constructed to include deductions for low correlation between the various markets and thus a lower stress level. The components and calculations of the indicator are described in Appendix 2 in Danmarks Nationalbank, *Financial stability*, 2nd Half 2014.
Source: Bloomberg, Nordea Analytics and own calculations.

equity markets were hit by turmoil and tumbling prices, and in August the People's Bank of China announced changes in the exchange rate policy. The financial stress level fell back to a low level during the autumn.

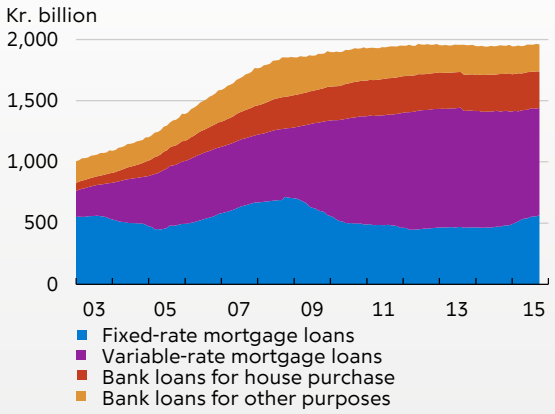
HOUSEHOLD DEBT IS HIGH, BUT CURRENTLY POSES ONLY A LIMITED THREAT TO FINANCIAL STABILITY

HOUSEHOLDS ARE MOVING TOWARDS LOANS WITH LONGER FIXED INTEREST PERIODS

The exceptionally low level of interest rates makes it easier for households to service their debt. But in terms of financial and economic stability, it is also important that families are financially resilient to a higher level of interest rates. Households have large debts, predominantly at variable rates of interest, cf. Chart 2.4. This means that changes in interest rates have a considerable impact on households' interest payments.

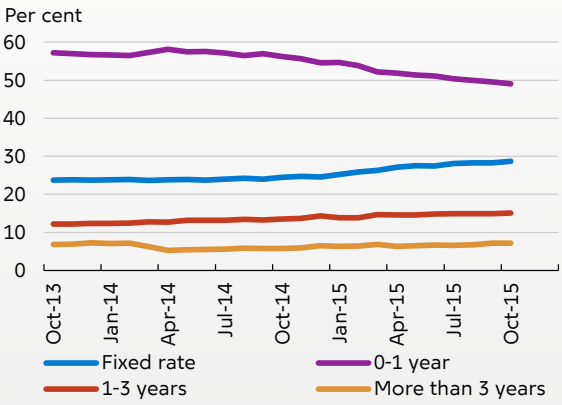
Over the last year and a half, households have moved towards loans with longer fixed interest periods, cf. Chart 2.5. Hence, fixed rate mortgage loans make up a higher percentage of household debt, and the period until the next refinancing has generally increased for variable rate mortgage loans.

Lending to households broken down by fixed rate and variable rate loans Chart 2.4



Note: Mortgage loans for owner-occupied homes and weekend cottages. A fixed rate mortgage loan has a constant rate of interest throughout the maturity of the loan, typically 30 years. A variable rate mortgage loan has a rate of interest that is adjusted one or more times over the life of the loan, typically every year or every two, three or five years. Bank loans cover all lending by banks to households, predominantly at variable rates of interest.
Source: Danmarks Nationalbank.

Lending to households broken down by remaining fixed interest period Chart 2.5



Note: Mortgage loans for owner-occupied homes and weekend cottages and bank loans for households. "Fixed rate" indicates fixed rate mortgage loans. The intervals indicate time to next interest rate fixing for bank loans and variable rate mortgage loans.
Source: Danmarks Nationalbank.

The trend towards longer maturities intensified in early 2015, when some mortgage customers used the fall in interest rates to remortgage into loans for which the rate of interest could be fixed at a low level for a longer period of time. Furthermore, the mortgage banks have changed their price structures over a number of years, in favour of loans with longer fixed interest periods.

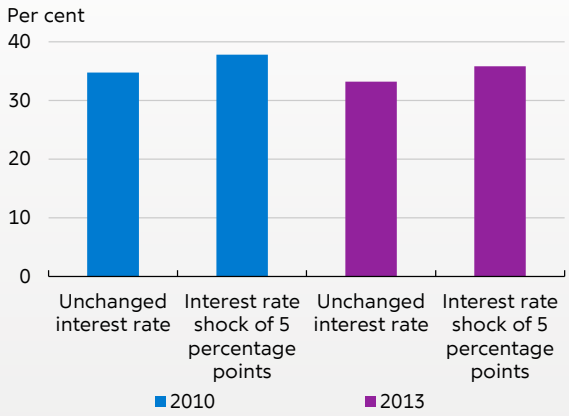
FAMILIES ARE FINANCIALLY RESILIENT TO HIGHER INTEREST RATES

The vast majority of families are financially resilient to a considerable rise in interest rates. Obviously, the disposable amount will decrease, but a limited number of families will go from having money to spare to being short of funds when they have paid taxes, serviced their debt and paid other fixed expenses, assuming that their consumption is average for their family type. In other words, their financial margin[1] will go from being positive to being negative. Thus, in the event of a 1-year interest rate shock of 5 percentage points,

1 The financial margin is defined as the amount a family has left when it has paid housing expenses, other fixed expenses and general living costs equivalent to standardised budgets for different family types.

Share of families with negative financial margins

Chart 2.6



Note: The financial margin has been calculated at end-2010 and end-2013 for all families, with and without debt. A budget has been applied corresponding to the average consumption for a family of the given family type.

Source: The mortgage banks, Statistics Denmark and own calculations.

only 3 per cent of families in 2013 would go from having a positive to having a negative financial margin, cf. Chart 2.6.[2] Presumably, these families would be able to manage a situation of below-average consumption, however, especially if it were only for a brief period of time.

Compared with the situation in 2010, families' sensitivity to interest rates was not quite so pronounced in 2013. Furthermore, in 2013, a slightly lower percentage of families had a negative financial margin both with and without the rise in interest rates, the primary reason being the increase in families' disposable income during the period.

The analysis views the rise in interest rates in isolation, not taking into account that the economic situation will change if interest rates increase substantially. For example, higher interest rates per se will have a negative impact on house prices, just as higher interest rates may reflect growth in economic activity and thus incomes.

LARGE LOANS TO HOMEOWNERS WITH HIGH DEBT RATIOS

The credit institutions have considerable lending to homeowners with high debt ratios. In this analysis, having a high debt ratio is defined as having debt that is larger than the value of the home and at least four times higher than the family's annual income before tax.

Families in this group are subject to increased risk of not being able to service their loans. Among families with high debt ratios, the share of families in arrears is thus more than five times higher than for other families with mortgage debt. In addition, it can be expected that those families have probably defaulted on a larger share of other loans, including bank loans. This is because a mortgage loan is often the last item of debt that a family with a tight budget defaults on.[3]

The combination of high total debt relative to both the value of the family's home and its income entails particularly high risk of lenders incurring losses, cf. Chart 2.7. The reason is that a family with a high debt-to-income ratio spends a higher percentage of its income on servicing the loan. This makes it more difficult for the family to service the loan, thereby increasing the risk of default. This is particularly relevant if interest rates increase and the loans are at variable rate. Whether default leads to lenders incurring losses depends on whether the loans exceed the sales price of the collateral pledged. If that is the case, the loss will increase, the larger the debt is relative to the value of the collateral. The following sections discuss total debt relative to the value of the home. Part of the debt may be secured on assets other than the home, e.g. a car.[4]

In 2013, the debt of homeowners with high debt ratios exceeded kr. 200 billion, corresponding to almost 12 per cent of the total debt of families with mortgage loans, cf. Chart 2.8. Most of the debt was mortgage debt, but these families had relatively more bank debt and other debt than families with lower debt ratios, cf. Chart 2.9.

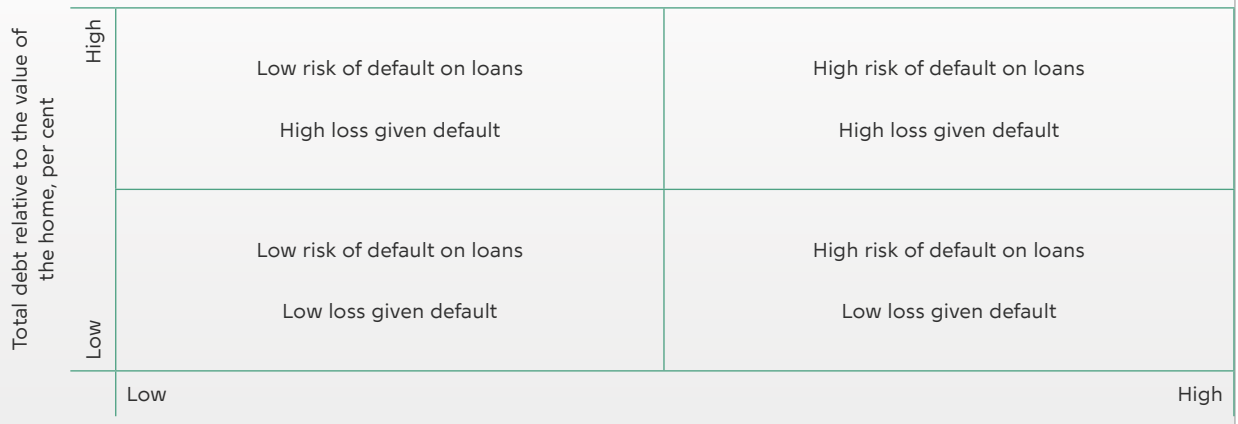
2 The analysis is based on microdata for the finances of households at end-2013. The conclusion is the same if the data is projected by developments in the macro figures for 2014. The sensitivity analysis is based on an update of Asger Lau Andersen, Anders Møller Christensen, Charlotte Duus and Ri Kaarup, "Danish families' financial robustness, variable rates and deferred amortisation", Danmarks Nationalbank, *Monetary Review,* 4th Quarter 2012, Part 2.

3 For a more detailed analysis, see Asger Lau Andersen and Charlotte Duus, "Danish families in mortgage arrears", Danmarks Nationalbank, *Monetary Review,* 3rd Quarter 2013, Part 2.

4 The data set is at individual level and contains all homeowners, excluding self-employed individuals, non-tax payers and families with an annual income of less than kr. 25,000 and debt of less than kr. 15,000 kr. Car values are disregarded, but a robustness analysis shows that the conclusions are the same whether they are included or not.

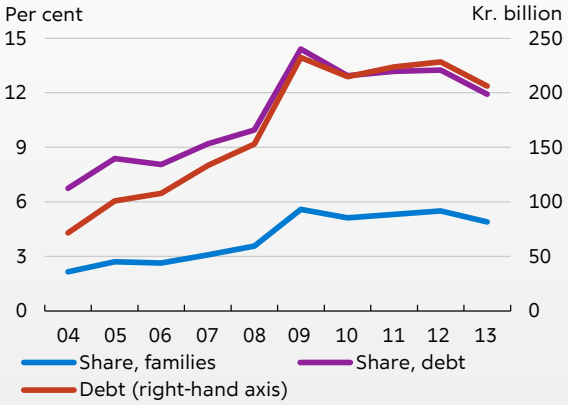
Risk of default on loans and loss size at different volumes of total debt relative to the value of the home and income

Chart 2.7



Families with high debt relative to both the value of the home and their income

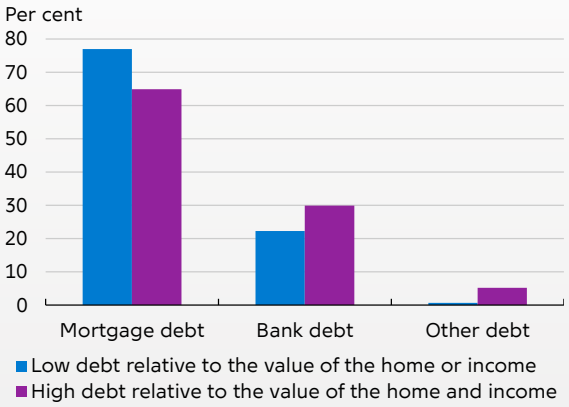
Chart 2.8



Note: Families whose total debt exceeds the value of their home and constitutes at least four times their annual gross income. Percentages are relative to all homeowners with debt exceeding kr. 15,000.
Source: Statistics Denmark and own calculations.

Debt broken down by type of debt for families with low and high debt ratios, 2013

Chart 2.9



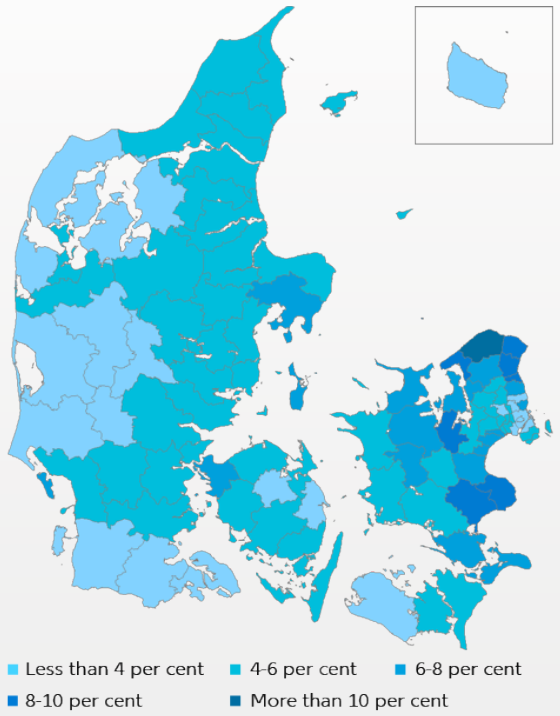
Note: "Low debt relative to the value of the home or income" covers families whose total debt is lower than the value of their home or constitutes less than four times their gross income. "High debt relative to the value of the home and income" covers families whose total debt exceeds the value of their home and constitutes at least four times their gross income.
Source: Statistics Denmark and own calculations.

Credit institutions' exposures to homeowners with high debt ratios may change substantially within very few years, as was the case in the period 2007-09, cf. Chart 2.8. This primarily reflects macroeconomic conditions. For example, an economic downturn will normally lead to falling employment and hence lower income for a number of families. Moreover, house prices will typically fall. This means that more families will move into the group with high debt ratios, even though their debt measured in kroner is unchanged. As this group grows, it will gradually account for a larger share of homeowners' debt.

House price developments contribute to geographical differences in the distribution of families with high debt ratios, cf. Chart 2.10. Thus, they constitute a relatively larger share in the municipalities in Region Zealand than in the rest of Denmark.

Percentage of families with high total debt relative to both the value of the home and their income, 2013

Chart 2.10



Note: Families whose total debt exceeds the value of their home and constitutes at least four times their gross income as a percentage of families with a home and total debt exceeding kr. 15,000.
Source: Statistics Denmark and own calculations.

Conversely, the share of families with high debt ratios is lower in the western part of Jutland.

In Region Zealand, house prices rose substantially until 2007. This increased homeowners' opportunities to raise loans against the home as collateral, and the higher prices caused many families to take out larger loans to get onto the housing market or to purchase a larger home. So, when house prices dived in 2007-08, the individual homeowner's total debt increased relative to the value of the home. This meant that more families moved into the group with high debt ratios. Subsequently, the rise in house prices has been modest in Region Zealand, and total debt relative to the value of the home therefore remains high for many families. Conversely, house prices and debt have been much more stable in western Jutland.

FAMILIES WITH HIGH DEBT RATIOS MAY HAVE PROBLEMS IF INTEREST RATES RISE OR IN THE EVENT OF AN ECONOMIC DOWNTURN

The debt of homeowners with high debt ratios is distributed on relatively few families. Thus, families whose debt exceeded the value of the home and was at least four times higher than the family's annual income accounted for only 5 per cent of families with debt in 2013, cf. Chart 2.11.

For families with high debt ratios in 2013, there were indications that they generally had sufficient income to service their debt.[5] Almost 80 per cent of the debt of homeowners with high debt ratios was owed by families in the upper half of the distribution of income among all Danish families. All the same, the high debt makes these families vulnerable if their income is reduced, e.g. due to unemployment or illness. Moreover, 75 per cent of the families with high debt ratios have variable rate mortgage loans, making them vulnerable if interest rates rise.

The risk on loans to families with high debt ratios is reduced because the families' high debt is to some extent accompanied by large assets, and the families also have values other than their home to draw on in case of financial problems. The value of some of the assets, e.g. equities and bonds, usually mirrors the economic situation, however. This means that their value may decrease in an economic downturn or in a situation with rising interest rates, when the need to draw on such assets may be particularly pronounced.

Younger families were overrepresented among families with high debt ratios in 2013. This indicates that families use the financial system to smooth their consumption, including housing, so as to distribute it more evenly over life than their income. Younger families have had a limited number of years on the labour market with the opportunity to reduce their debt. Some loans may also have been raised and granted in expectation of higher future incomes that had yet to materialise in 2013.

5 For a more detailed analysis, see Asger Lau Andersen, Anders Møller Christensen, Ri Kaarup, Sigrid Koob, Nick Fabrin Nielsen and Martin Oksbjerg, "The wealth and debt of Danish families", Danmarks Nationalbank, *Monetary Review,* 2nd Quarter 2012, Part 2.

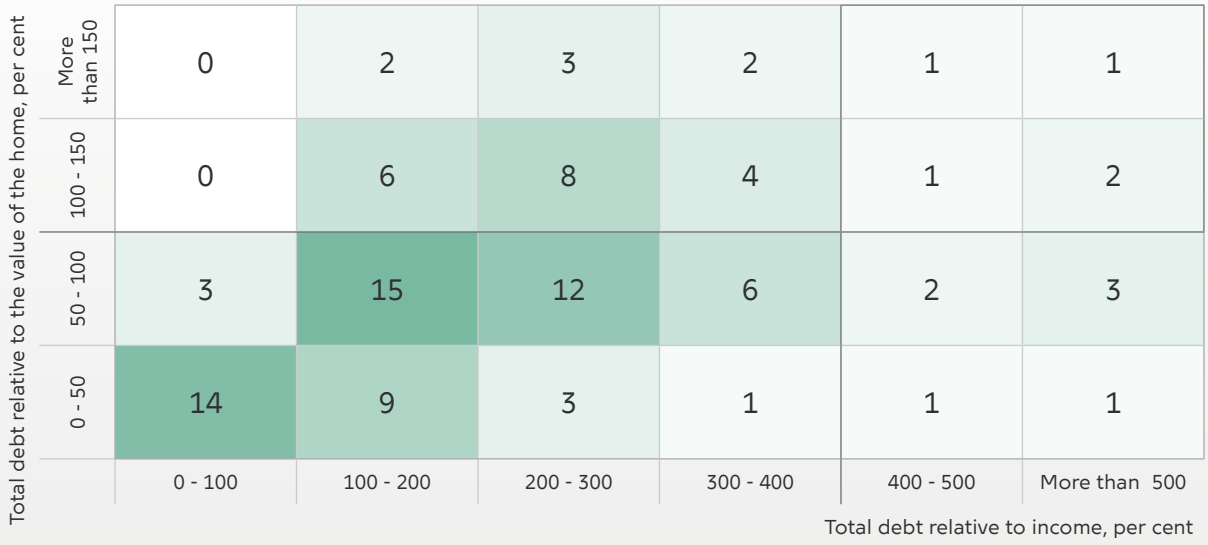
A HIGH DEBT RATIO IS A LONG-TERM PHENOMENON

If a family has a high debt ratio, this will often be the case for several years. Hence, the family has been unable to increase its income sufficiently or to reduce its debt, even though this was needed.

Of the families with high debt ratios in 2013, half were in the same group four years earlier, cf. Chart

Percentage of homeowners with debt, broken down by total debt relative to the value of the home and their income, 2013

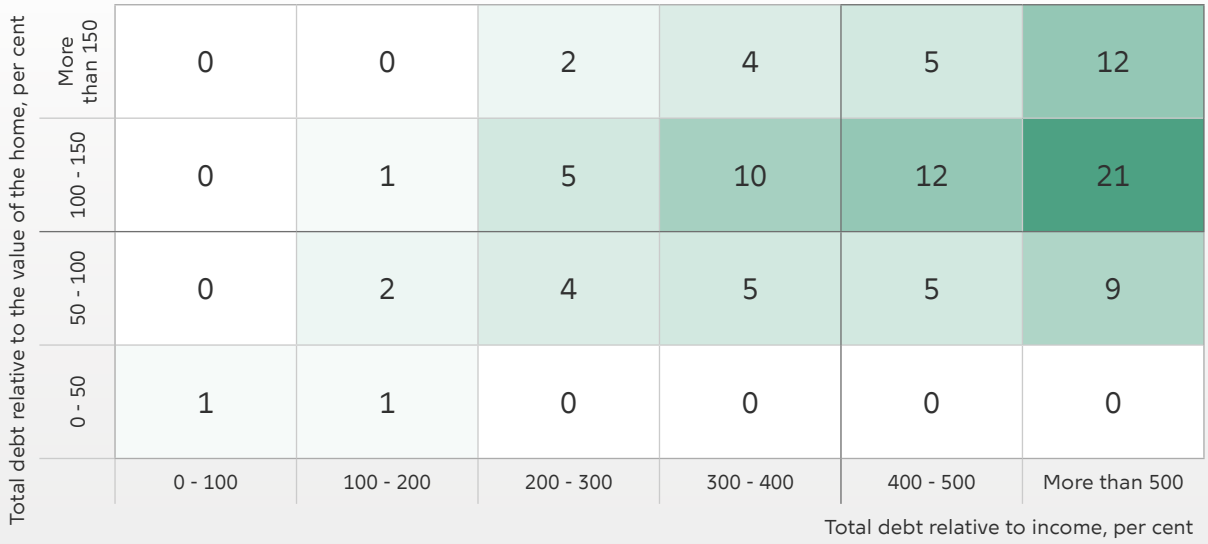
Chart 2.11



Note: The table breaks down homeowners with debt exceeding kr. 15,000 in 2013 by their total debt relative to the value of their home and their annual gross income. For example, the field in the lower left-hand corner shows that 14 per cent of homeowners with debt exceeding kr. 15,000 in 2013 had total debt relative to their income of between 0 and 100 per cent and total debt relative to the value of their home of between 0 and 50 per cent.
Source: Statistics Denmark and own calculations.

Families with high debt ratios in 2013 broken down by their debt ratios in 2009

Chart 2.12



Note: Families with total debt exceeding the value of their home and constituting at least four times their gross income in 2013.
Source: Statistics Denmark and own calculations.

Families with high debt ratios in 2009 broken down by their debt ratios in 2013 Chart 2.13

Total debt relative to the value of the home, per cent	0 - 100	100 - 200	200 - 300	300 - 400	400 - 500	More than 500
More than 150	0	1	3	7	6	11
100 - 150	0	1	7	14	11	15
50 - 100	0	2	5	5	3	5
0 - 50	1	0	0	0	0	0

Total debt relative to income, per cent

Note: Families with total debt exceeding the value of their home and constituting at least four times their gross income in 2009.
Source: Statistics Denmark and own calculations.

2.12. Most of the remaining families already had high total debt relative to the value of their home or income in 2009. Only around one in seven of these families had low debt relative to both the value of their home and their income in 2009.

Looking ahead in time, a similar pattern is seen for families with high debt ratios. Of the families with high debt ratios in 2009 who still owned a home in 2013, 43 per cent were still in the group with high debt ratios four years later, cf. Chart 2.13.[6] After four years, only 13 per cent of the families had moved to the group with low debt relative to both the value of their home and their income.

Some of the families with high debt ratios in 2009 had subsequently sold their home and not purchased a new one, potentially because their financial situation was too weak. In line with this, almost 8 per cent of the families with high debt ratios in 2009 did not own a home four years later. By comparison, the corresponding figure was just over 4 per cent for the families with low debt ratios in 2009.

THE HOUSING MARKET IS OF GREAT IMPORTANCE TO DANISH CREDIT INSTITUTIONS

Banks and mortgage banks have substantial direct exposures to the housing market. Their total domestic lending to households for housing purposes amounts to just under kr. 1,750 billion, or approximately 90 per cent of GDP. The loans are mainly provided by mortgage banks, cf. Chart 2.14, whose lending for owner-occupied homes and holiday homes constitutes more than 55 per cent of their domestic lending to households and the corporate sector. For banks, the corresponding share is 35 per cent.

The housing market also has indirect effects on the soundness of the financial sector. For example, changes in housing wealth have a considerable impact on private consumption, reflecting the high household debt and housing wealth. Fluctuations in private consumption also affect firms through changes in demand for their goods.

Since the financial crisis, mortgage banks have increased their lending for housing, while it has remained flat for banks. Hence, lending for hous-

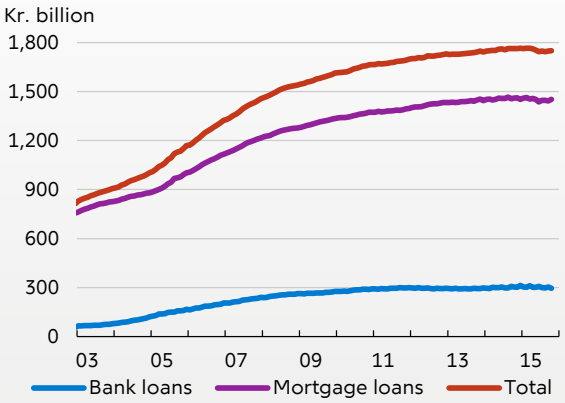
6 80 per cent of the families with high debt in 2009 also existed in 2013 and owned a home. The other families did not own a home in 2013 or had split up, e.g. because a member had found a (new) partner or had become single.

ing purposes also increased in the years when house prices fell. Home values have increased in the most recent years, however, thereby reducing the average loan-to-value ratio of households, cf. Chart 2.15. Other things being equal, this implies that loans have generally become more secure, as a lower loan-to-value ratio reduces the banks' losses if the collateral has to be realised due to default on the loan.

DEVELOPMENTS IN THE SWEDISH AND NORWEGIAN HOUSING MARKETS ENTAIL HIGHER RISKS FOR A FEW DANISH BANKS

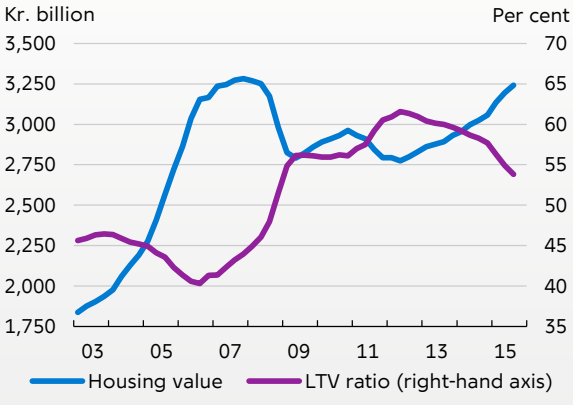
Some Danish banks also have exposures to the Swedish and Norwegian housing markets. Total lending by Danish banks to the housing markets of those two countries amounts to just over kr. 145 billion, cf. Chart 2.16. This corresponds to

Lending to households for housing purposes Chart 2.14



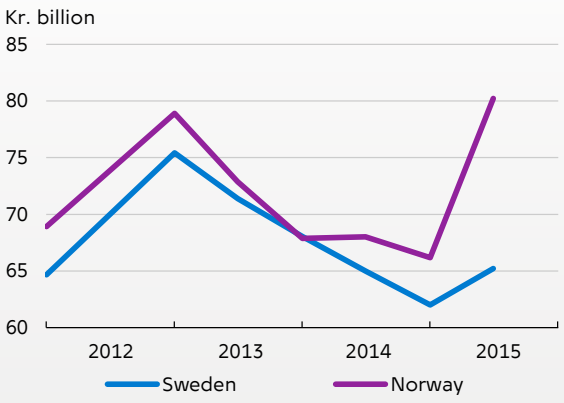
Note: Includes lending by Danish banks and mortgage banks and Danish branches of foreign banks.
Source: Danmarks Nationalbank.

Housing wealth and loan-to-value ratio Chart 2.15



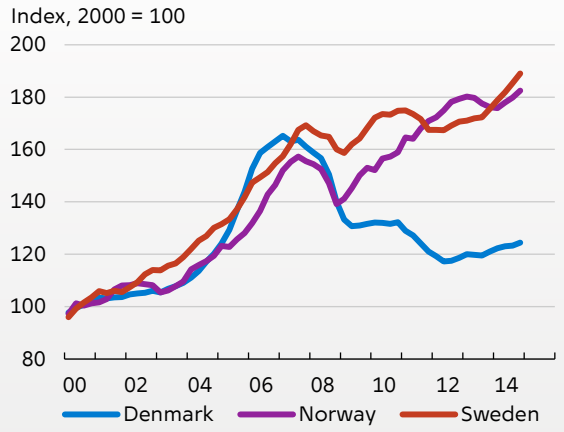
Note: The loan-to-value ratio is given by lending to households for housing purposes relative to housing wealth. Housing wealth does not include agricultural land, commercial properties owned by the household sector, cooperative housing and undeveloped building sites.
Source: Danmarks Nationalbank.

Lending by Danish banks for homes in Sweden and Norway Chart 2.16



Note: Lending by Danske Bank for homes in Sweden and Norway according to the financial statements plus lending to households in those two countries by Danish banks' branches in Denmark.
Source: Danske Bank's financial statements and Danmarks Nationalbank.

Real house price developments Chart 2.17

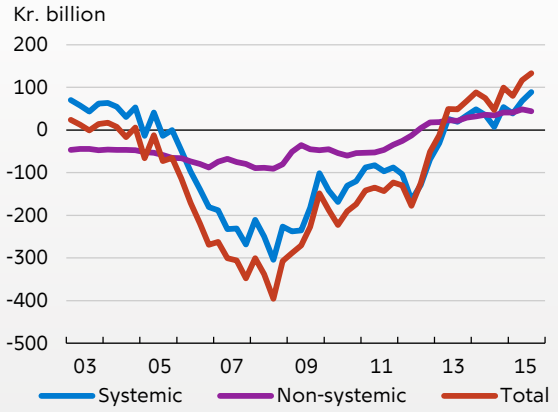


Note: Nominal house prices deflated by the deflator for private consumption according to the national accounts.
Source: OECD.

almost half of the banking sector's domestic loans to the Danish housing market.

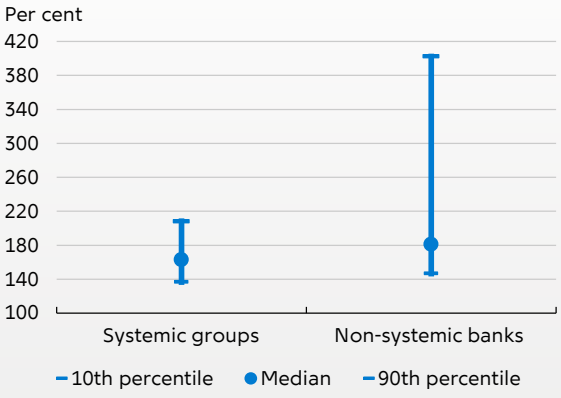
Both Sweden and Norway have seen substantial increases in house prices for several years, and measured in real terms, house prices have risen by 80-90 per cent since 2000, cf. Chart 2.17. In the assessment of the International Monetary Fund, IMF, the housing markets of both countries are considerably overrated, and the OECD also suggests that the prices seem to be too high.

Customer funding surpluses Chart 2.18



Note: Lending and deposits excluding repo transactions in domestic banks, but including repo transactions in their foreign branches. The most recent observation is from September 2015.
Source: Danmarks Nationalbank and own calculations.

Liquidity Coverage Ratio, LCR Chart 2.19



Note: October 2015.
Source: Danish Financial Supervisory Authority and own calculations.

Housing loans are vulnerable in the event of a price adjustment, but derived effects on the rest of the economy may also result in losses on other loans. In total, Danish banks have provided lending to Sweden and Norway of approximately kr. 250 and 120 billion, respectively, including lending to the corporate sector, households and other financial institutions, among others.

In the summer of 2015, the Danish Financial Supervisory Authority reviewed Danske Bank's new lending in Sweden. The Authority found that in relation to the current situation in the Swedish property market, the bank was running a significant risk of incurring substantial future losses with its chosen growth strategy.

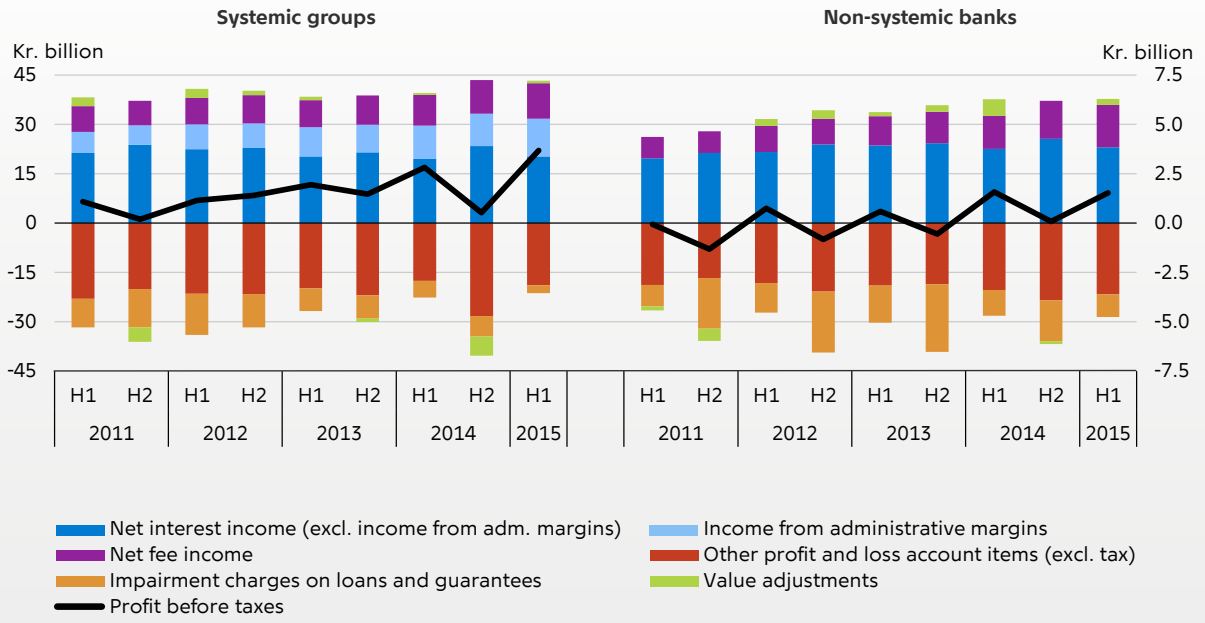
CREDIT INSTITUTIONS FULFIL NEW LIQUIDITY REQUIREMENT

The banks' liquidity situation is robust. This is reflected in a steadily increasing customer funding surplus, which in the 3rd quarter of 2015 reached the highest level since the statistics were introduced in 2003, cf. Chart 2.18.

As from 1 October 2015, the Liquidity Coverage Ratio, LCR, requirement applies to all credit institutions. The purpose of the requirement is to ensure that the banks always have adequate high-quality liquid assets to cover the outflow of liquidity in a 30-day liquidity stress scenario. The systemic groups must observe the requirement 100 per cent, while the non-systemic banks must comply with a minimum LCR requirement of 60 per cent. For the non-systemic banks, the requirement will be gradually tightened to a minimum LCR requirement of 100 per cent by 2018.

When the requirement came into force in October, it was observed by all the systemic groups with a substantial margin, cf. Chart 2.19. The non-systemic banks also had an LCR of more than 100 per cent in October, although this will not be required until 2018. Excess cover relative to the minimum requirements is expedient as the LCR may be volatile over time. To ensure that the banks have continuous access to adequate liquid-

Earnings broken down by main items Chart 2.20



Source: Danish Financial Supervisory Authority and own calculations.

ity during the transition to the new requirement, the previous requirement for excess liquidity cover[7] will be kept as a minimum requirement for the non-systemic banks.

BANKS HAVE PUT THE FINANCIAL CRISIS BEHIND THEM

CREDIT INSTITUTIONS' EARNINGS HAVE IMPROVED

Overall, the credit institutions achieved the highest profit since the financial crisis in the 1st half of 2015. Hence, a clear improvement was also seen relative to the 1st half of 2014, when one-off revenue in connection with the sale of shares in Nets and Jyske Bank's takeover of BRFkredit had a positive impact on total profits.

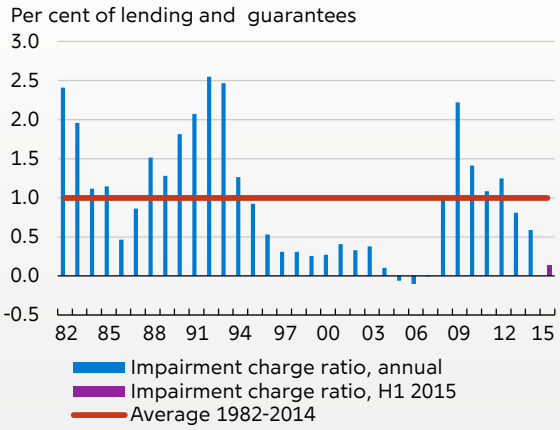
The higher profit in the 1st half of 2015 was achieved despite low demand for new loans and a historically low level of interest rates. Developments in the financial markets affected bank earnings in several ways. The very high level of activity in the foreign exchange market at the beginning of the year entailed higher earnings from exchange rate hedging in the largest banks. At the same time the falling interest rates resulted in an increase in the volume of remortgaging. This contributed to rising fee income, which, coupled with increased revenue from administration margins payable on mortgage loans and lower impairment charges on bank loans, is the main explanation for the improved results, cf. Chart 2.20.

As a result of the higher profits of the systemic groups,[8] their average return on equity increased from 9.4 per cent p.a. in the 1st half of 2014 to 10.9 per cent p.a. in the 1st half of 2015. For the non-systemic banks, total profits were slightly lower in the 1st half of 2015 than in the same period of 2014. Combined with an increase in equity, this meant that their average return on equity fell from 10.1 per cent p.a. in the 1st half of 2014 to 9.2 per cent p.a. in the 1st half of 2015.

7 So far, excess liquidity cover has been calculated according to Section 152 of the Danish Financial Business Act, which requires that a bank should have adequate liquid funds to cover at least 10 per cent of its total debt and guarantee exposures or 15 per cent of its short-term debt exposures.

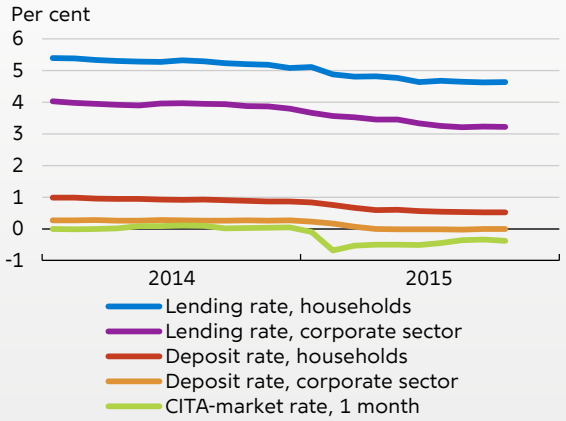
8 Systemic groups cover the group as a whole, i.e. including any mortgage banks and insurance companies, and comprise the six systemically important financial institutions, SIFIs, Danske Bank, Nykredit Realkredit, Nordea Bank Danmark, Jyske Bank, Sydbank and DLR Kredit.

Banks' loan impairment charges Chart 2.21



Note: Loan impairment charges as a percentage of loans and guarantees before loan impairment charges for banks in the Danish Financial Supervisory Authority's groups 1-3.
Source: Cato Baldvinsson, Torben Bender, Kim Busch-Nielsen and Flemming Nytoft Rasmussen, *Dansk Bankvæsen* (Danish banking – in Danish only), 5th edition, Forlaget Thomson (2005), Statistics Denmark, Danish Financial Supervisory Authority and own calculations.

Money market interest rate and the banks' average deposit and lending rates Chart 2.22



Note: The money market interest rate is the monthly average of the 1-month CITA swap rate.
Source: Danmarks Nationalbank.

The financial statements of the systemic groups for the 3rd quarter of 2015 shows that they did not succeed in maintaining the growth in earnings achieved in the 1st half of 2015. This is partly due to lower revenue from remortgaging, and at the same time net interest income is still squeezed by the low level of interest rates and stagnant lending volumes.

LOAN IMPAIRMENT CHARGE RATIOS ARE LOW

The loan impairment charge ratio for 2015 as a whole is set to be significantly lower than the average annual loan impairment charge ratio for the period 1982-2014, cf. Chart 2.21. Thus, the banks' loan impairment charges in the 1st half of 2015 amounted to only 0.1 per cent of their total loans and guarantees.

The low level of the loan impairment charges should be viewed in the light of the improved economic situation and the rising values of the properties pledged as collateral for the loans. This has enabled some banks to reverse previously recognised impairment charges, entailing a reduction of the impairment charges for the period. The reversals can be seen as an indication that the credit quality among weak customers is improving. For lending to the agricultural sector, the increase in new impairment charges remains high, however, cf. the section on agriculture below.

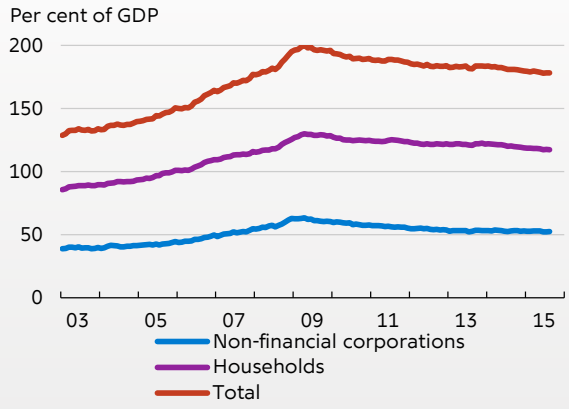
BANK EARNINGS ARE SQUEEZED BY DECLINING INTEREST MARGINS

The interest rate falls in the first months of the year contributed to amplifying the pressure on the banks' net interest income.[9] At the current level of interest rates, deposit rates are adjusted with a certain lag, and it is still only a limited share of total deposits that earn interest at a negative rate. From the end of 2014 to October 2015, however, the banks reduced the average deposit rates for households and the corporate sector by 0.4 and 0.3 percentage points, respectively, which are almost on a par with the fall in the short-term money market interest rates over the same period, cf. Chart 2.22. This did not match the decline in lending rates, however, resulting in a narrowing of the banks' interest margins.

The reason for the fall in interest margins may be that in the banks' assessment, credit risks are

9 See the article "Negative interest rates and their impact on credit institutions' earnings", Danmarks Nationalbank, *Financial stability*, 1st Half 2015.

Lending by banks and mortgage banks relative to GDP Chart 2.23



Source: Statistics Denmark and Danmarks Nationalbank.

declining, and hence they have reduced the risk premium to cover borrowers' loan defaults. They may have done this based on the current development in loan impairment charges. However, the risk premium should be sufficiently large to cover expected future losses over the term of the loan.

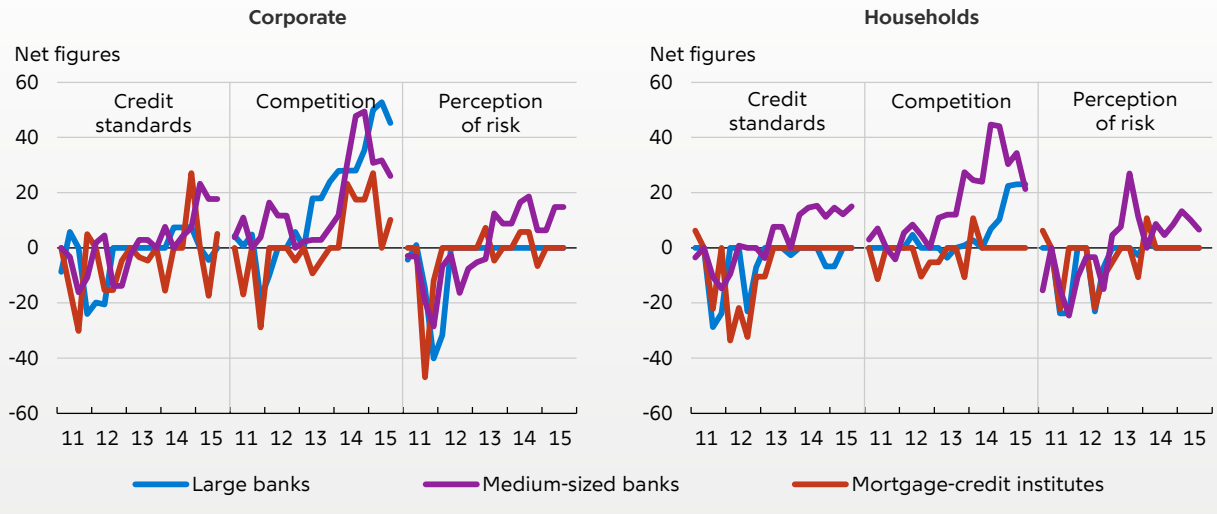
THE CREDIT INSTITUTIONS SHOULD NOT LOWER THEIR CREDIT STANDARDS IN ORDER TO BOOST BUSINESS VOLUMES

Total lending by Danish banks and mortgage banks is virtually flat. Demand for new loans from existing corporate and retail customers also remains relatively subdued according to Danmarks Nationalbank's lending survey. This should be seen in the context of lending being high relative to GDP, cf. Chart 2.23, and the fact that it has not declined in recent years despite a strong increase in the pre-crisis years, when the economy was overheated and the credit conditions of some banks were too loose.

Moreover, experience from previous economic recoveries shows that demand for credit does not increase until well into an upswing. One reason is that firms typically rely on internal funding at the beginning of an upswing, while they tend to rely more on borrowing later on.

These factors emphasise that it is important that the credit institutions do not lower their credit standards in order to boost business volumes, and that they should carry out a thorough assessment in connection with potential lending.

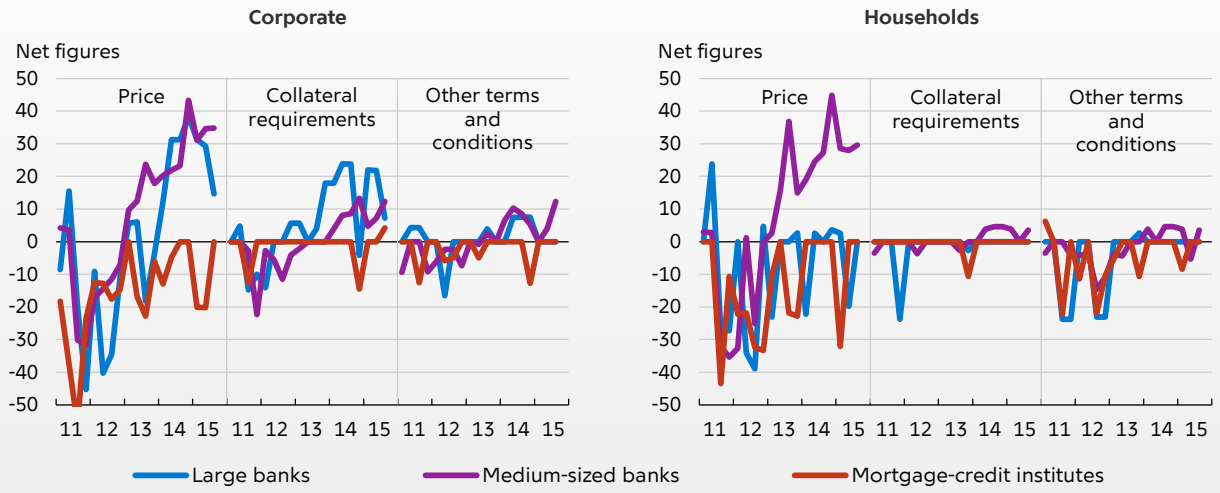
Changes in credit standards and underlying factors Chart 2.24



Note: Large and medium-sized banks are in line with the Danish Financial Supervisory Authority's group 1 and 2, respectively. The net balance lies within the interval -100 to 100. A positive (negative) net balance for the credit standard means that credit managers of the banks in question have overall, i.e. lending-weighted, stated an easing (tightening) relative to the preceding quarter. In terms of the factors underlying the credit standard, a positive (negative) net balance indicates that the change in the factor has contributed to an easing (tightening) of the credit standard.

Source: Danmarks Nationalbank.

Changes in credit conditions Chart 2.25



Note: Large and medium-sized banks are in line with the Danish Financial Supervisory Authority's group 1 and 2, respectively. The net balance lies within the interval -100 to 100. A positive (negative) net balance means that credit managers of the banks in question have, overall, i.e. lending-weighted, stated an easing (tightening) of credit conditions relative to the preceding quarter.
Source: Danmarks Nationalbank.

CREDIT CONDITIONS ARE BECOMING A COMPETITIVE PARAMETER

In view of the high level of lending and the current situation in the financial sector, it gives cause for concern when some of the medium-sized banks state, in recent quarters in Danmarks Nationalbank's lending survey, that they have eased their credit standards for corporate and retail customers, cf. Chart 2.24. Underlying factors include an improvement in risk perception, i.e. according to their responses to the lending survey, they have a more favourable view on economic activity, the housing market and the outlook for specific sectors and firms. Neither the large banks nor the mortgage banks have reported improvements in risk perception.

According to the lending survey, the credit institutions find that competition for both corporate and retail customers has intensified in recent quarters, cf. Chart 2.24, reflecting that there is a basis for fiercer competition for customers. Interest rates are very low and the development in lending volume is flat, while many banks have high excess liquidity cover and excess capital adequacy relative to the minimum requirements. This also applies in relation to the requirements that will be phased in over the coming years, e.g. LCR and capital buffer requirements, cf. below.

As a result of the intensified competition, some banks report that they have reduced their prices, e.g. margins and fees, especially in relation to corporate customers, cf. Chart 2.25. A few banks also state that they have eased their requirements for e.g. guarantees, liability and company charges in relation to corporate customers. This indicates that for some banks, credit conditions have become a competitive parameter. If this trend intensifies, it may weaken the robustness of the sector.

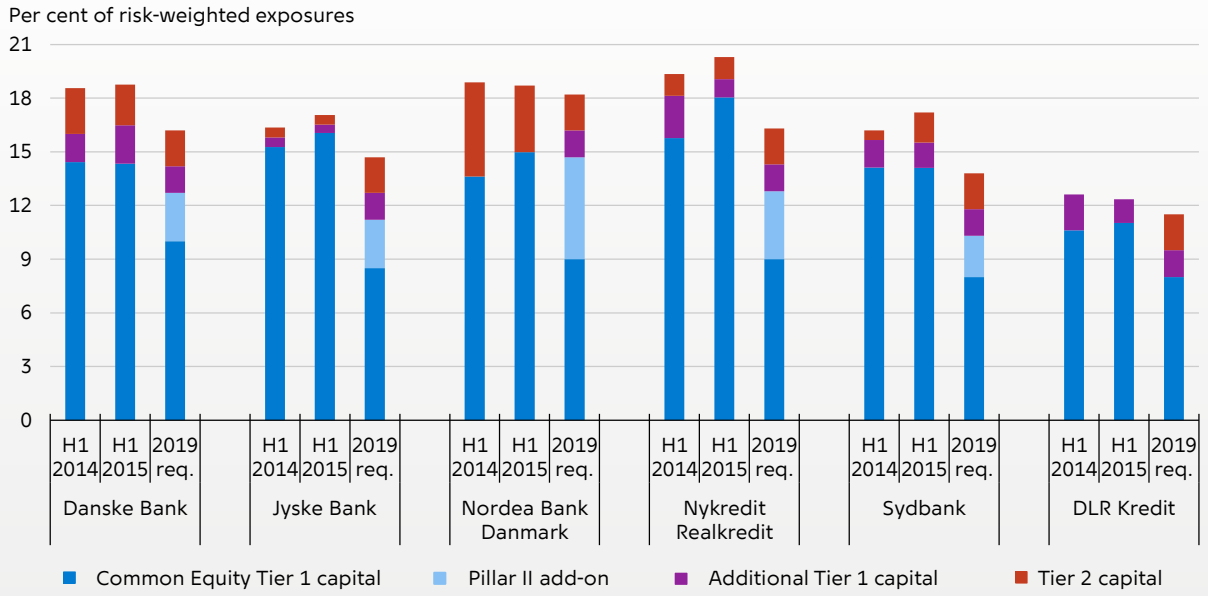
According to the lending survey, overall demand for loans from new customers in both the corporate and retail segments has increased in recent quarters. The increase in new lending has been limited during this period, however, and there have been only minor shifts in the market shares of banks as regards lending to retail and corporate customers, respectively, despite reports of intensified competition.

CAPITAL REQUIREMENTS WILL BE TIGHTENED IN THE COMING YEARS

THE SYSTEMIC GROUPS COMPLY WITH THE STRICTER CAPITAL REQUIREMENTS IN 2019

All systemic groups have substantial excess capital adequacy relative to their current requirements.

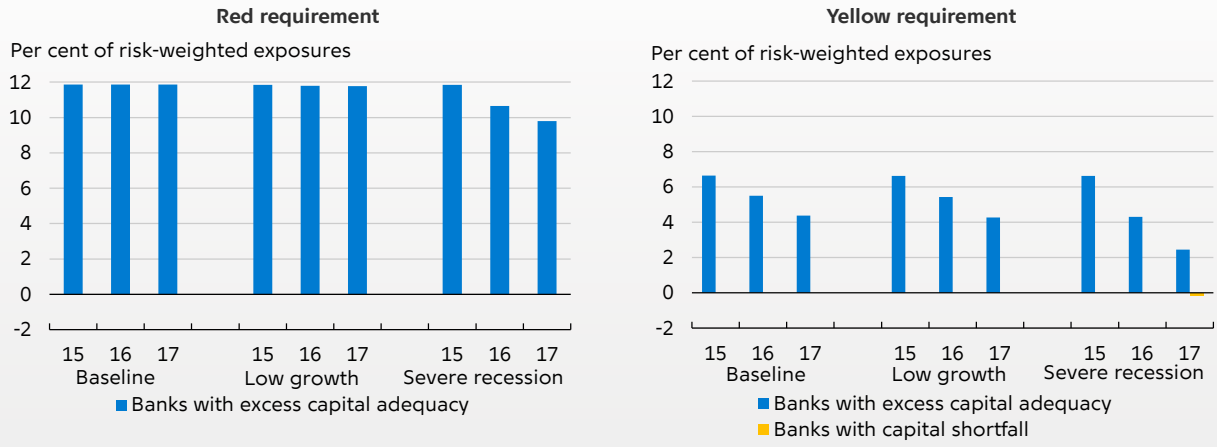
Capital base of systemic groups and their fully phased-in capital requirements Chart 2.26



Note: The capital base has been calculated at the end of the quarter, and the transition rules until 2021 have not been taken into account. The current Pillar II add-on of the credit institutions can be met by means of Common Equity Tier 1 capital or other types of capital. The Pillar II add-ons in the 3rd quarter of 2015 are assumed to remain unchanged until 2019. In November 2015, a draft executive order on capital requirements for meeting the individual Pillar II add-on was submitted by the Danish Financial Supervisory Authority for consultation, envisaging changes in the distribution and quality of the capital which can be used to meet the add-on. The current countercyclical capital buffer rate of 0 per cent has been applied. All capital requirements can be met using Common Equity Tier 1 capital, while the regulation restricts the use of Additional Tier 1 capital and Tier 2 capital. For further details on requirements for the composition of capital, see "Capital instruments", *Financial stability*, 1st Half 2014, Danmarks Nationalbank.
Source: Danish Financial Supervisory Authority and own calculations.

This helps to ensure their robustness, as it means that they have a buffer in the event of losses that will not be covered by current earnings. Furthermore, risk-weighted exposures fluctuate over time due to changes in the compiled risks. This leads to fluctuations in the capital ratios, so there

Excess capital adequacy or capital shortfall of the systemic banks Chart 2.27



Note: Excess capital adequacy or capital shortfall as a percentage of the systemic banks' total risk-weighted exposures.
Source: Danish Financial Supervisory Authority and own calculations.

should be some excess capital adequacy relative to the requirements.

Overall, the Common Equity Tier 1 ratio increased in Danish SIFIs from the 2nd quarter of 2014 to the 2nd quarter of 2015, cf. Chart 2.26. It remained unchanged in Danske Bank and Sydbank, however. Both groups have implemented share buy-back programmes this year. This should be seen in light of the fact that at the end of 2014 they had Common Equity Tier 1 ratios that exceeded their respective targets.

The capital requirements will be tightened in the coming years. This will be achieved e.g. by phasing in a capital conservation buffer from 2016. For SIFIs, a SIFI capital buffer, the size of which depends on the group's systemic importance, will also be phased in from this year. Although these requirements will not be fully

Danmarks Nationalbank's stress test model and stress scenarios

Box 2.1
continues next page

Danmarks Nationalbank assesses Danish banks' capitalisation in various macroeconomic scenarios based on its stress test model.

The stress test includes 5 systemic and 11 non-systemic banks,[1] which constituted 85 and 9 per cent, respectively, of Danish banks' lending and guarantees in the 2nd quarter of 2015. The analysis is based on the banks' interim reports for the 1st half of 2015, the income statements and balance sheets being projected until and including the 4th quarter of 2017.

Stress scenarios

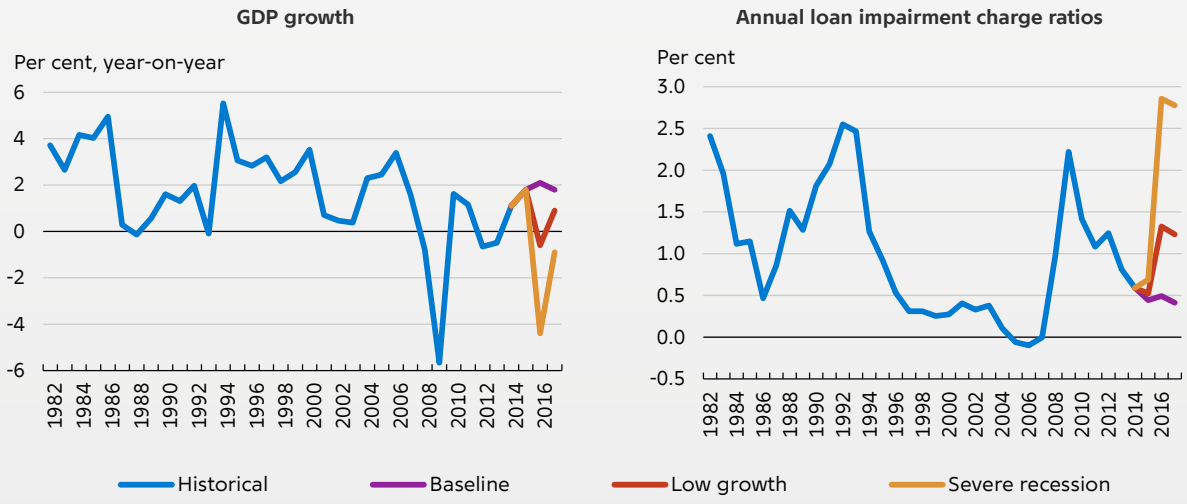
The projection is performed in three macroeconomic scenarios (baseline scenario, low growth and severe recession), cf. Chart A (left). The scenarios have been developed in cooperation with the Danish Financial Supervisory Authority. The loan impairment charges will increase in the scenarios with stress, particularly in the severe recession scenario, where the loan impairment charge ratio reaches a level slightly above the peak in 1992, cf. Chart A (right).[2]

The baseline scenario is based on Danmarks Nationalbank's macroeconomic projection, cf. Monetary Review, 3rd Quarter 2015. As the model is using on a number of conservative assumptions in the projection, however, the baseline scenario does not represent a projection of banks' capitalisation.

The low growth scenario implies weak development in economic activity with rising unemployment. Private consumption and house prices fall, thereby developing somewhat less favourably than in the baseline scenario.

The severe recession scenario reflects a global shock to business and consumer confidence. The Danish economy is also affected by an erosion of consumer confidence. The shocks result in falling private consumption and house prices, and GDP drops by more than 4 per cent in 2016. See Appendix 2 for selected key variables for the scenarios.

Chart A. The macroeconomic scenarios of the stress test



Note: Right-hand chart: Loan impairment charges calculated as a percentage of lending and guarantees before loan impairment charges. The historical series until and including 2014 is based on banks in the Danish Financial Supervisory Authority's groups 1-3. The estimated loan impairment charge ratios for 2015-17 have been calculated as a weighted average of the 16 banks in the stress test.

Source: Cato Baldvinsson, Torben Bender, Kim Busch-Nielsen and Flemming Nytoft Rasmussen, *Dansk Bankvæsen* (Danish banking – in Danish only), 5th edition, Forlaget Thomson (2005), Danish Financial Supervisory Authority, Statistics Denmark and own calculations.

Continued Box 2.1

Capitalisation and capital requirements in the stress test

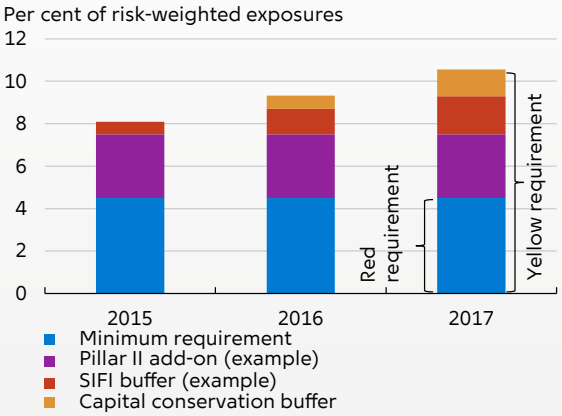
In the stress test, the banks' capital in the projection period is compared with two capital requirements, a red and a yellow requirement. The red requirement is the minimum requirements under CRD IV/CRR.[3] The yellow requirement is the total capital requirements, i.e. the red requirement plus the Pillar II add-on and the capital buffer requirements, cf. Chart B.

Non-compliance with the red requirement will prompt the Danish Financial Supervisory Authority to revoke the banking licence, unless the bank recapitalises by a fixed short deadline.

In the event of non-compliance with the yellow requirement, the Danish Financial Supervisory Authority may impose limitations on dividend payments or order the banks to implement other measures that will become gradually more extensive as the capital shortfall increases. This includes, inter alia, that the bank is required to prepare a capital conservation plan to be approved by the Danish Financial Supervisory Authority. If the plan is not approved, the Danish Financial Supervisory Authority will order the bank to increase its capital base by a fixed deadline.

For banks not complying with one of the requirements, the individual bank's Common Equity Tier 1 capital shortfall in order to return to compliance is calculated. The capital shortfall can be interpreted as the capital injection the bank in question needs in the stress test period to ensure compliance with the given requirement. For the banks with more Common Equity Tier 1 capital than is needed for compliance with one of the requirements, the excess capital adequacy is also calculated in relation to the requirement.

Chart B. Illustration of the Common Equity Tier 1 capital requirements in the stress test



Note: The red requirement is the minimum requirements under CRD IV/CRR. The yellow requirement is the red requirement plus the Pillar II add-on, which has been set at 3 per cent of risk-weighted exposures for illustration purposes, the SIFI capital buffer, which has been set at the upper buffer limit in each of the years for illustration purposes, and the capital conservation buffer.

1. The population is the Danish Financial Supervisory Authority's groups 1 and 2, excluding Saxo Bank and FIH Erhvervsbank, cf. Appendix 1.
2. The structure, assumptions and capital requirements of the stress test model are detailed in "Technical Appendix: Danmarks Nationalbank's stress test", Danmarks Nationalbank, *Financial stability*, 1st Half 2015.
3. The minimum requirement regarding Common Equity Tier 1 capital is 4.5 per cent of risk-weighted exposures. The minimum requirements regarding Tier 1 capital and total capital are 6 and 8 per cent, respectively. A bank can issue Additional Tier 1 capital and Tier 2 capital to meet the minimum requirements in addition to 4.5 per cent Common Equity Tier 1 capital. The stress test assumes that any capital shortfall will be covered by Common Equity Tier 1 capital, as this is fully loss-absorbing.

phased in until 2019, all systemic groups observed them at the end of the 2nd quarter of 2015.

Moreover, a countercyclical buffer was introduced in 2015, but it is currently set at 0 per cent. If the countercyclical buffer is activated, this, combined with the other capital requirements, may result in some SIFIs having to increase their capitalisation in the coming years in order to comply with the requirements.

THE SYSTEMIC BANKS HAVE SUBSTANTIAL EXCESS CAPITAL ADEQUACY RELATIVE TO THE MINIMUM REQUIREMENTS

Danmarks Nationalbank's stress test shows that the five systemic banks all have substantial excess capital adequacy in relation to the minimum requirements until 2017, which is as far as the projection goes, cf. Chart 2.27 (left). This also applies in the severe recession scenario. See Box 2.1 for a description of the stress test model and the scenarios and capital requirements applied, including the definitions of the red and yellow requirements mentioned below.

A market-based stress test, SRISK, also finds that the systemic banks have positive excess capital adequacy in a severe stress situation, cf. Box 2.2. The market-based stress test relies, inter alia, on the listed banking groups' equity prices, thereby utilising the market's forward-looking assessment of the groups' capitalisation.

In relation to the yellow requirement, which is the red requirement plus the Pillar II add-on requirement, the SIFI capital buffer and the capital conservation buffer, the banks' excess capital

SRISK – a market-based stress test

Box 2.2

The systemic risk measure SRISK shows that the four groups, Danske Bank, Nordea, Jyske Bank and Sydbank, have positive excess capital adequacy in a severe stress situation, cf. Chart A.[1] SRISK is a market-based stress test that measures the market assessment of the excess capital adequacy or capital shortfall of a given banking group in the event of a large general equity market drop.[2]

SRISK and Danmarks Nationalbank's stress test model supplement each other

SRISK supplements Danmarks Nationalbank's stress test model to assess the capitalisation of the large listed banking groups. One reason is that the stress test model and SRISK use different information, capital requirements and sources of stress.

Danmarks Nationalbank's stress test uses the banks' financial statements and measurement of capital. SRISK uses the equity market's assessment of the groups' equity and risk profiles, thereby exploiting that all public information and market expectations of future events should be incorporated into equity prices. At the same time, equity prices are available on a daily basis. By comparison, financial statements are backward-oriented and published once every quarter only – and with a certain lag relative to the time of calculation.

The capital requirement of SRISK is set at 3 per cent of the assets, which are measured as the market value of a group's equity capital plus the book value of its other liabilities. Unlike Danmarks Nationalbank's stress test, SRISK does not use risk weights, as SRISK is based solely on the market assessment of the group and its risks.

Finally, SRISK supplements Danmarks Nationalbank's stress test model by using another source of stress. In SRISK, the stress scenario is a general equity market drop, whereas it is a negative shock to the economy in the stress test. The two types of stress are not independent, however, as the equity market will typically fall if economic activity slows down.

SRISK in practice

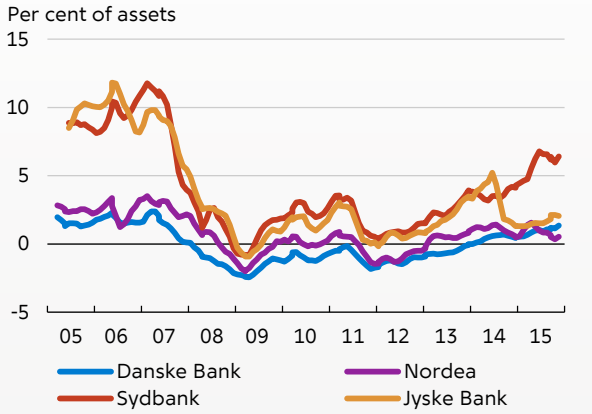
SRISK assumes that there will be a drop in the equity market as a whole of minimum 40 per cent over the next six months. By comparison, the European Euro Stoxx 600 stock index fell by 42 per cent from August 2008 and six months ahead.

The value of the banking group's equity capital – and thus the market assessment of its capitalisation – is reduced in the event of a general drop in the equity market. The drop in market value is estimated using a dynamic econometric model that models the covariation between the development in a group's equity prices and the equity market. The riskier the market assesses the group to be, the more the market value of the group will fall in the event of a market drop.

The banks are weighted against a capital requirement of 3 per cent of the assets. Any capital shortfall in SRISK indicates the market's assessment of how much equity capital the group needs to raise during the stress period in order to comply with the capital requirement.

According to SRISK, the groups have periodically had such high risk and low excess capital adequacy that their excess capital adequacy would in all probability become negative in the event of a new severe shock. That was also the case for all four groups during the financial crisis.

Chart A. Excess capital adequacy in banking groups according to SRISK



Note: 3-month moving averages. The value of the assets is measured as the market value of the group's equity capital plus the book value of its other liabilities. The most recent observations are from the financial statements for the 3rd quarter of 2015 and equity prices as at 26 November 2015. The capital requirement for all groups is assumed to be 3 per cent of the assets. The stress scenario is a drop of minimum 40 per cent over six months in the Euro Stoxx 600 index.
Source: Bloomberg, SNL Financials and own calculations.

1. The group as a whole is included in the assessment, i.e. also any subsidiaries such as mortgage banks. Hence, there is a difference compared with Danmarks Nationalbank's stress test, which included banks only. Likewise, the Nordea group as a whole is included, not only the Danish banking activities.
2. The theory behind SRISK and calculations for international financial groups are described in Christian Brownlees and Robert Engle (2015), "SRISK: A Conditional Capital Shortfall Index for Systemic Risk Measurement", Department of Finance, New York University, *Working Paper*.

adequacy declines towards 2017. This should be viewed in the context of the rising buffer requirements in the coming years, which will cause a bank's excess capital adequacy to decline if its capitalisation is unchanged.

The banks' Common Equity Tier 1 ratios decline in the severe recession scenario. Combined with the rising buffer requirements, this means that some systemic banks will have a capital shortfall of approximately kr. 2 billion relative to the yellow

requirement in 2017. This corresponds to 0.1 per cent of the systemic banks' total risk-weighted exposures, cf. Chart 2.27 (right).

In the event of non-compliance with the yellow requirement, the Danish Financial Supervisory Authority may impose limitations on dividend payments or order the banks to implement other measures that will become gradually more extensive as the capital shortfall increases.

It is uncertain how negatively investors will respond if a systemic bank fails to comply with its yellow requirement. Their reaction may be of great importance as the systemic banks rely on continuous access to funding from the financial markets – irrespective of macroeconomic developments.

SEVERAL NON-SYSTEMIC BANKS WILL ENCOUNTER CAPITAL SHORTFALLS IN PERIODS OF STRESS

It could be a challenge for several non-systemic banks to meet the future capital requirements if the economy develops considerably less favourably than in the baseline scenario, cf. Chart 2.28 (left). The result reflects low excess capital adequacy, high loan impairment charges and depressed earnings in several non-systemic banks.

In a severe recession, a number of non-systemic banks will fail to comply with the red requirement in 2017, when they will have a combined capital shortfall of approximately kr. 5 billion. That is equivalent to approximately 3 per cent of the non-systemic banks' total risk-weighted exposures – or 0.3 per cent of the total risk-weighted exposures of the stress test population. In Danmarks Nationalbank's assessment, this will not pose a threat to financial stability. The assessment is based on the size of the capital shortfall and its distribution on the affected banks.

In relation to the yellow requirement, more non-systemic banks will have a capital shortfall. In the severe recession scenario, the non-systemic banks' capital shortfall will be around kr. 8 billion in 2017, cf. Chart 2.28 (right).

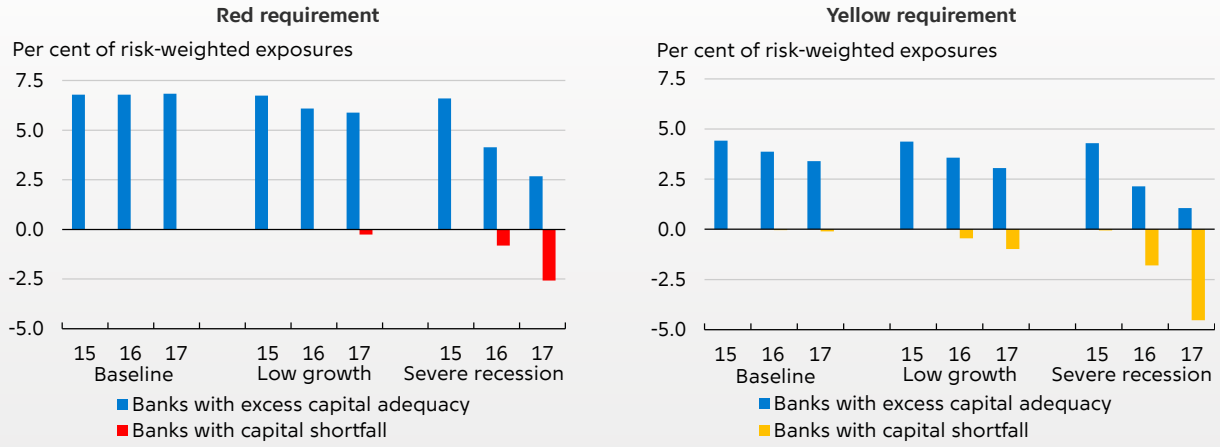
If a non-systemic bank fails to comply with the yellow requirement, this can be expected to be of minor importance to the bank. The reason is that the non-systemic banks are less dependent on short-term market funding, as a larger share of their funding comes from ordinary deposits. For ordinary deposits, amounts up to 100,000 euro, corresponding to approximately kr. 750,000, are covered by the deposit guarantee scheme.

THE AGRICULTURAL SECTOR IS IN A CRISIS, BUT NO THREAT TO THE SOUNDNESS OF THE FINANCIAL SECTOR

Many farmers are burdened with large debt and struggling to service their loans. If interest rates rise or market prices decrease further, even more farmers will see their bottom lines turn red. This may lead to lower prices for farms, including falls in land prices – and thus less collateral for

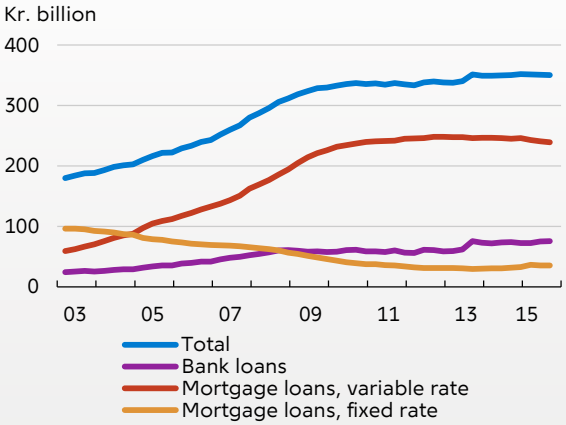
Excess capital adequacy or capital shortfall of the non-systemic banks

Chart 2.28



Note: Excess capital adequacy or capital shortfall as a percentage of the non-systemic banks' total risk-weighted exposures.
Source: Danish Financial Supervisory Authority and own calculations.

Lending to the agricultural sector Chart 2.29



Note: The upward movement in bank loans between the 2nd and 3rd quarters of 2013 is attributable to the transition to new MFI statistics.
Source: Danmarks Nationalbank.

the loans. As a result, the agricultural sector may inflict further losses on the credit institutions.

THE AGRICULTURAL SECTOR'S DEBT IS HIGH

The high level of debt in the agricultural sector was built up in years up to 2010, when lending to agriculture rose sharply, cf. Chart 2.29. Since 2010, lending by banks and mortgage banks to agriculture has been around kr. 350 billion, and annual interest expenses have been around kr. 8 billion. By comparison, the sector's earnings after financial items were just over kr. 4 billion in the period 2010-15.[10]

Investments in the agricultural sector fell sharply after the financial crisis, and they have been lower than depreciation in recent years. This reduces the sector's potential for obtaining liquidity by reducing investments. Moreover, the ongoing erosion of the capital stock has a negative impact on productivity and may therefore reduce the sector's competitiveness and earnings in the longer term.

INCREASING LOAN IMPAIRMENT CHARGES ON AGRICULTURE

Earnings in the agricultural sector are being squeezed by falling market prices in the last couple of years, but the prices are not extraordinarily low in a long-term perspective. At present, the sector is also being buoyed up by the very low interest rates. All the same, a number of farmers are operating at a loss and struggling to service their debt.

As a result, the banks' loan impairment ratios remain high for agricultural loans, while they have been declining for other industries. At the end of 2014, lending by banks to the agricultural sector had been written down by 14 per cent on average. This level reflects the farmers' current financial situation and whether it is likely that they will be sufficiently profitable to achieve positive equity in the shorter or longer term. The level is supported by a credit survey conducted by the Danish Financial Supervisory Authority in 2014 across the agricultural loans in several banks with high exposure to agriculture.

There is considerable variation among the banks in terms of how large a share of their agricultural loans they have written down. This should be viewed in the context of marked differences in the credit quality of agricultural loans across the banks, reflecting that the credit conditions of a number of banks were too loose in the pre-crisis years.

INCREASING NUMBER OF FARMS IN COMPULSORY LIQUIDATION

The number of compulsory liquidations in the agricultural sector has increased in recent years, but for the banks as a whole, the losses have been lower than the loan impairment charges. Losses on loans which have already been written down will not have a negative impact on the banks' capital, as long as they do not exceed the loan impairment charges.

In the current situation, it may be difficult to find buyers, especially for some farms. If many distressed farms are put up for sale at the same time in a given area, this will cause local price pressures. That will lead to higher loan impairment charges and potentially higher realised losses for those banks which have provided lending to agriculture in that area.

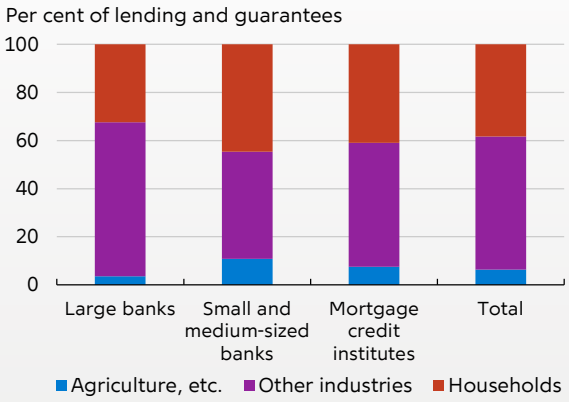
Hence, the banks may have an incentive to keep farms alive which are operating at a loss and

10 The figures for 2014-15 are based on forecasts from *Danish Agricultural Economy 2014,* Department of Food and Resource Economics, University of Copenhagen.

not expected to become profitable in the coming years. If so, it would put the sector in a locked situation. To ensure economically better utilisation of resources and strengthen agricultural earnings it is necessary for the banks to realise their losses and close farms with an unsustainable operating economy. Moreover, the banks' losses may increase over time if they keep such farms alive. This is particularly true if they defer the loss by financing the current deficits, thereby increasing the volume of bad debts. Lending by banks to the agricultural sector rose by kr. 1.4 billion from the 3rd quarter of 2014 to the 3rd quarter of 2015.

Loans to agriculture as a share of lending by banks and mortgage banks

Chart 2.30



Note: "Agriculture, etc." includes agriculture, forestry and fishing. Data from end-June 2015. Large banks are banks in the Danish Financial Supervisory Authority's group 1, while small and medium-sized banks are banks in the Danish Financial Supervisory Authority's groups 2 and 3.
Source: Danish Financial Supervisory Authority.

RISK OF SUBSTANTIAL LOSSES ON THE AGRICULTURAL SECTOR IF INTEREST RATES RISE

The exposures of the individual credit institutions to the agricultural sector vary considerably.

For some banks, the agricultural sector accounts for more than 15 per cent of total lending and guarantees. This group is made up of small, local banks. For the group of large banks, the agricultural sector accounts only for 3.5 per cent of total lending and guarantees, cf. Chart 2.30.

DLR Kredit is a mortgage bank specialising in lending to the agricultural sector and therefore particularly exposed to that sector compared with the other mortgage banks. Part of DLR Kredit's risk of loss is transferred to the collaborating banks, however, as DLR Kredit's loans are comprised by a guarantee agreement with those banks.

The credit institutions should reckon with the possibility of a large increase in loan impairment charges and losses if market prices remain low and interest rates suddenly rise sharply. This is particularly important as 90 per cent of agricultural debt is at variable rates of interest.

A rise in interest rates will in all probability be accompanied by a recovery of the economy overall. But market prices for agricultural products do not necessarily mirror the economy in Denmark and the euro area, and farmers may therefore face a situation of higher interest rates without an improvement in their market conditions.

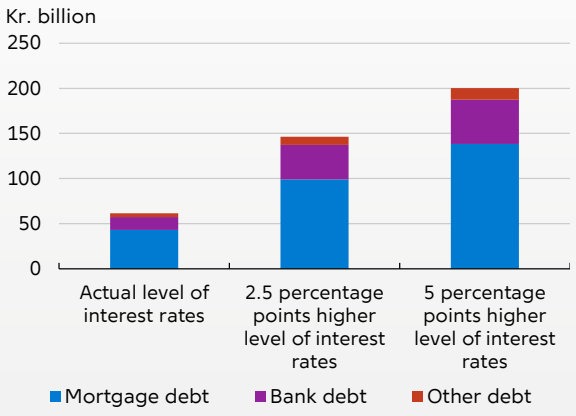
Higher interest rates or lower market prices will, all else equal, lead to lower prices for farms. Hence, the collateral pledged for the loans will decrease in value. This may increase the losses of banks, which rank after the mortgage banks in the event of compulsory liquidation. Conversely, the risk of losses is considerably lower for the mortgage banks, as mortgage loans to the agricultural sector may not exceed 60 per cent of the value of the collateral when raised. In other words, it requires a substantial price drop after the loan is raised if a mortgage bank is to incur a loss.

In 2014, total bank lending to unprofitable farms amounted to just over kr. 14 billion, cf. Chart 2.31. In the event of a rise in interest rates of 2.5 percentage points, far more farms will become unprofitable, and the total bank debt of such farms will be kr. 38 billion.[11] If interest rates on variable rate mortgage loans rise by 2.5 percentage points, the interest rate level will roughly correspond to the current interest rate on a fixed rate mortgage loan. Hence, many farmers will not be able to afford to remortgage to a fixed rate loan, which would otherwise protect them against future increases in the short-term interest rate. If interest rates increase by 5 percentage points,

11 This figure is a high-side forecast of the actual bank debt of unprofitable farms, as all mortgage loans in euro are assumed to be variable rate loans since the data does not include information on whether they are variable or fixed rate loans.

Debt for farms with operating losses in 2014 at the actual level of interest rates and at a higher level of interest rates

Chart 2.31



Note: "Actual level of interest rates" indicates debt for farms with operating losses in 2014. "2.5 percentage points higher level of interest rates" and "5 percentage points higher level of interest rates", respectively, show debt for farms that would have had operating losses in 2014 if interest rates had been 2.5 and 5 percentage points higher, respectively, in 2014. The debt is calculated by performing random checks of farm financial statements, so the amounts are not comparable with the debt calculated in the MFI statistics used in Chart 2.29.

Source: Statistics Denmark and own calculations.

even more farmers will see their bottom lines turn red. These farmers' bank debt amounts to just under kr. 50 billion.

SENSITIVITY OF STRESS TEST RESULTS TO HIGHER LOAN IMPAIRMENT CHARGES FOR AGRICULTURE

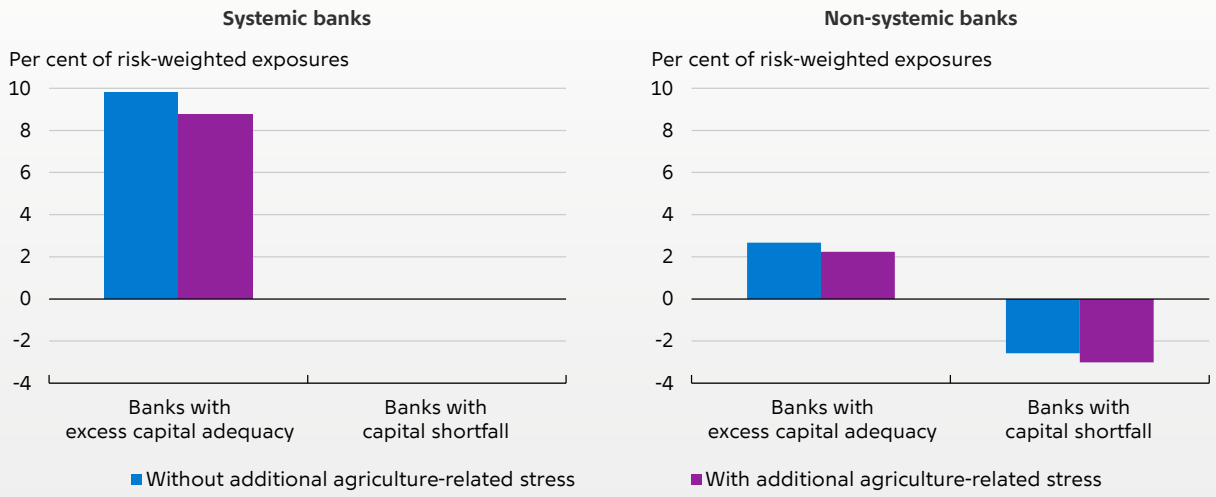
Danmarks Nationalbank finds that further, and very high, loan impairment charges for agriculture will not pose a threat to financial stability – not even in a scenario where the Danish economy is in a severe recession.

This assessment is based on Danmarks Nationalbank's stress test model, which projects the banks' loan impairment charges on households and industries, including the agricultural sector. If the loan impairment charges on agriculture become higher than estimated in the stress test model, the banks' capitalisation will deteriorate further.

In order to examine the sensitivity of the stress test results to higher loan impairment charges for agriculture in the event of a substantial rise in such charges, the impact on the banks' capitalisation has been analysed. The sensitivity is examined in the severe recession scenario, cf. the stress test section above. In the period 2015-17 it is assumed that the loan impairment charges will

Excess capital adequacy or capital shortfall in 2017 relative to the minimum requirements in a severe recession with and without additional agriculture-related stress

Chart 2.32



Note: Excess capital adequacy or capital shortfall as a percentage of the systemic banks' (left-hand chart) and non-systemic banks' (right-hand chart) total risk-weighted exposures. Severe recession is described in Box 2.1. Agriculture-related stress indicates that a bank's accumulated loan impairment charges for agriculture are at least 50 per cent at the end of 2017. Left-hand chart: There are no banks with capital shortfalls.

Source: Danish Financial Supervisory Authority and own calculations.

be so high that all banks will have written down at least 50 per cent of their lending to agriculture by the end of 2017. That is a very high level. By comparison, the agricultural exposures of the banks included in the stress test had been written down by 14 per cent by the end of 2014.

The systemic banks have relatively low exposures to agriculture, and they have written down a smaller share of their agricultural portfolio in recent years than the non-systemic banks. In order to achieve accumulated loan impairment charges of at least 50 per cent by the end of 2017, the loan impairment charges of the systemic banks must be increased relatively substantially during the stress test period. However, this does not change Danmarks Nationalbank's assessment that even in a scenario with extremely high loan impairment charges for agriculture, the systemic banks will have substantial excess capital adequacy relative to the minimum requirements, including in a severe recession scenario, cf. Chart 2.32 (left).

Many non-systemic banks have already made substantial loan impairment charges for agriculture, and according to the stress test model, they will need to make substantial loan impairment charges for agriculture in a severe recession. Hence, the additional loan impairment charges on lending to agriculture needed to achieve a level of 50 per cent are lower for the non-systemic banks, and the change in their capital shortfall will therefore be smaller, cf. Chart 2.32 (right).

Even with very large loan impairment charges on lending for agriculture, Danmarks Nationalbank finds that the size of the capital shortfall of the non-systemic banks does not pose any threat to financial stability, not even in the severe stress scenario.

3

LIQUIDITY IN THE MORTGAGE BOND MARKET

INTRODUCTION AND SUMMARY

Market participants and international organisations are becoming increasingly focused on market liquidity, especially in the bond markets.[1] The focus is on whether liquidity is declining and whether it has become less resilient.

High liquidity is reflected in lower costs and less risk in financial transactions, supporting an efficient financial system. Liquidity is a public good in the sense that while market participants collectively benefit from high liquidity, it is not necessarily optimal for the individual market participant to supply the amount of liquidity that is optimal for the market overall, especially not during periods of financial turmoil.

Mortgage bonds play a key role in the Danish credit market, and, like their counterparts in international bond markets, participants in the Danish mortgage bond market are concerned about falling liquidity. Based on the analysis in this chapter, the general level of liquidity in mortgage bonds is still assessed to be high. However, since the end of 2014 volatility has been higher, indicating that liquidity has become less resilient. Consequently, there is a risk that smaller shocks than previously may cause liquidity to evaporate

Banks play a pivotal role in providing liquidity in the bond market by absorbing imbalances between supply and demand in the market through their market making activities. Market participants indicate that over recent years, market makers have become less willing to absorb these imbalances. This should be seen in the context that risk appetite in the financial sector has tended to decline since the financial crisis. This is reflected, inter alia, in increased focus on the source of bank earnings among credit rating agencies and investors. Generally, earnings from substantial financial market trading activities are assessed more negatively. New regulation in the form of tighter capital and liquidity requirements has also affected banks' risk-taking. On the one hand, this development has made banks more resilient. On the other, lower risk appetite and new regulatory requirements may have reduced banks' market making activities.

In terms of the new regulatory measures, the primary focus is on the leverage ratio and the liquidity requirements Liquidity Coverage Ratio, LCR, and Net Stable Funding Ratio, NSFR. Only the LCR has been implemented. The new requirements have increased the focus on the costs of holding capital and liquidity, which may make banks assess that earnings from market marking are no longer sufficient.

Moreover, the current accommodative monetary policy and resulting low interest rates could affect liquidity in various ways. As a case in point, the accommodative monetary policy stance could contribute to keeping liquidity premiums low despite growing concerns over market liquidity.

1 See, inter alia, Bank of England (2015), Fender and Lewrick (2015) and IMF (2015).

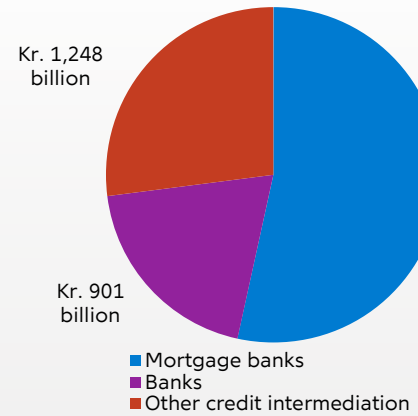
On the other hand, the exceptionally low level of interest rates could cause market makers to reduce their bond exposures.

One indication that banks are reducing market making is their reduction over the last year of portfolios of mortgage bonds for the business area.

The analysis in this chapter shows that the properties of mortgage bonds also affect their liquidity. For example, smaller series are assessed to be less liquid. This could mean that trade in the many small bond series may be challenged in a situation with declining market liquidity. At the same time, new liquidity requirements make it less attractive for credit institutions to hold bond series below a certain volume.

Liquidity resilience is also highly dependent on the creditworthiness of bonds. This was evident during the financial crisis when otherwise ample liquidity suddenly evaporated in a number of high-risk assets. Danish mortgage bonds have high credit ratings, which is reflected in the high level of liquidity. Internationally there are indications that liquidity is becoming more concentrated on few bond types with low credit risk. In such a situation it is essential that confidence in the system and the high creditworthiness of the bonds are maintained if the Danish market for mortgage bonds is to remain liquid.

Credit intermediation in Denmark Chart 3.1



Note: Credit intermediation comprises all loans and securities issued, excluding equities, to Danish households and non-financial corporations. Other credit intermediation comprises e.g. non-financial corporations' loans abroad and their corporate bonds issued. Data is from the end of 2nd quarter of 2015.
Source: Danmarks Nationalbank.

MARKET LIQUIDITY

A liquid market is characterised by enabling market participants, quickly and at any time, to execute large transactions at low cost and with little impact on the price level. A high level of market liquidity supports an efficient financial system. In addition to the level of liquidity, it is important that liquidity is resilient and does not evaporate in periods of increased market volatility. Sharp declines in liquidity during such periods could render the pricing of assets traded in the market uncertain and, in a worst case scenario, freeze the market. Focusing on mortgage bonds, this chapter analyses the drivers of developments in market liquidity. These include bonds properties such as series volume and maturity. Other drivers of liquidity and resilience are structural and cyclical conditions in the bond trading market. The analysis is based on trading data from MiFID transaction reports, cf. the Appendix.

LIQUIDITY IN THE MORTGAGE BOND MARKET SUPPORTS FINANCIAL STABILITY

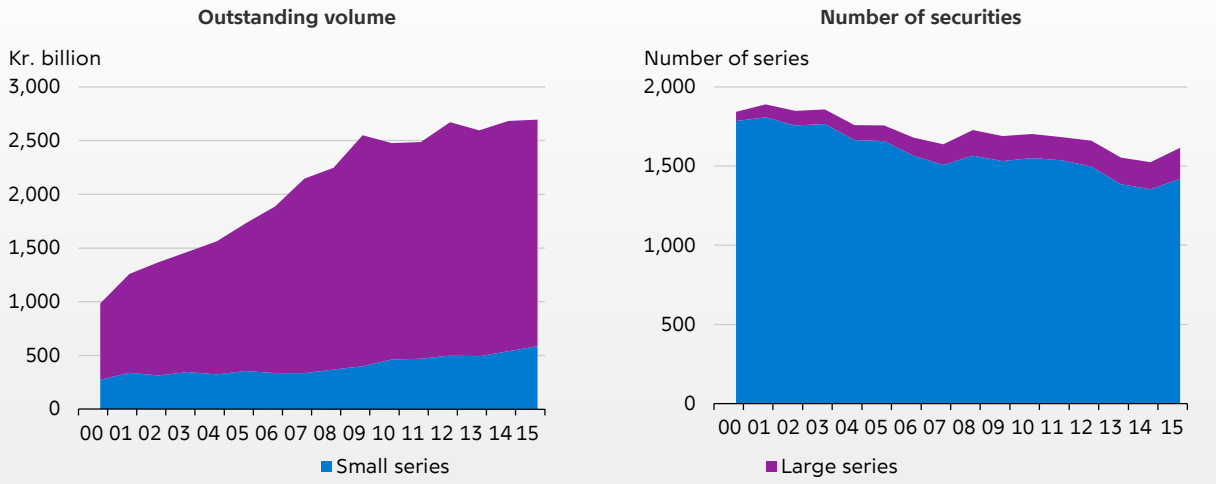
In Denmark, the mortgage bond market[2] is essential, accounting for a substantial portion of total lending, cf. Chart 3.1.[3] The Danish mortgage credit system is based on a balance principle that ensures close correlation between loans and bonds and limits the potential for mortgage banks to take interest rate and liquidity risks.

Lower market liquidity for mortgage bonds could lead to higher liquidity premiums on bond prices – and thus higher interest rates for borrowers. Ultimately, lower liquidity could increase the risk that mortgage banks may be unable to sell sufficient volumes of bonds at their auctions. A mortgage bank would then be unable to fund its continued operations, which could lead to problems for the individual mortgage bank, cf. Chapter 4, and to wider financial instability due to the pivotal role of mortgage banks in the Danish financial system.

2 Mortgage bonds are defined as all RO, SDO and SDRO issuances in Denmark.

3 For an analysis of the market liquidity of government bonds, constituting the other large debt market in Denmark, see Danmarks Nationalbank (2013).

Outstanding volume and number of securities broken down by series volume Chart 3.2



Note: Small (large) series are defined as series with an outstanding volume of less (more) than 500 million euro. The most recent observations are from the end of October 2015.
Source: Danmarks Nationalbank and own calculations.

LIQUIDITY DIFFERENCES ACROSS MORTGAGE BONDS

Bond liquidity is highly dependent on the properties of the securities. Firstly, the credit rating is an important factor in determining whether a bond is liquid. The high credit ratings of Danish mortgage bonds are reflected in the level of liquidity, which is assessed in several analyses as being high.[4] This view is generally supported by the analysis in this chapter. Across mortgage bonds, properties such as the volume of bond series, remaining maturity and the holders of the securities are significant factors in determining the level of liquidity.

A LARGE NUMBER OF BOND SERIES

Danish mortgage bonds are currently issued by six mortgage banks[5], the largest three of which, Nykredit, Realkredit Danmark and Nordea Realkredit, have between them issued just over 80 per cent of the outstanding volume of mortgage bonds. The outstanding volume is increasingly concentrated in large series, in October 2015 accounting for approximately 80 per cent of the total outstanding volume, cf. Chart 3.2 (left).

Although the number of small series has decreased steadily over time, most mortgage bonds remain in a large number of small series, cf. Chart 3.2 (right). One explanation for the high number of bond series is that mortgage banks offer a wide range of loan types to their customers.

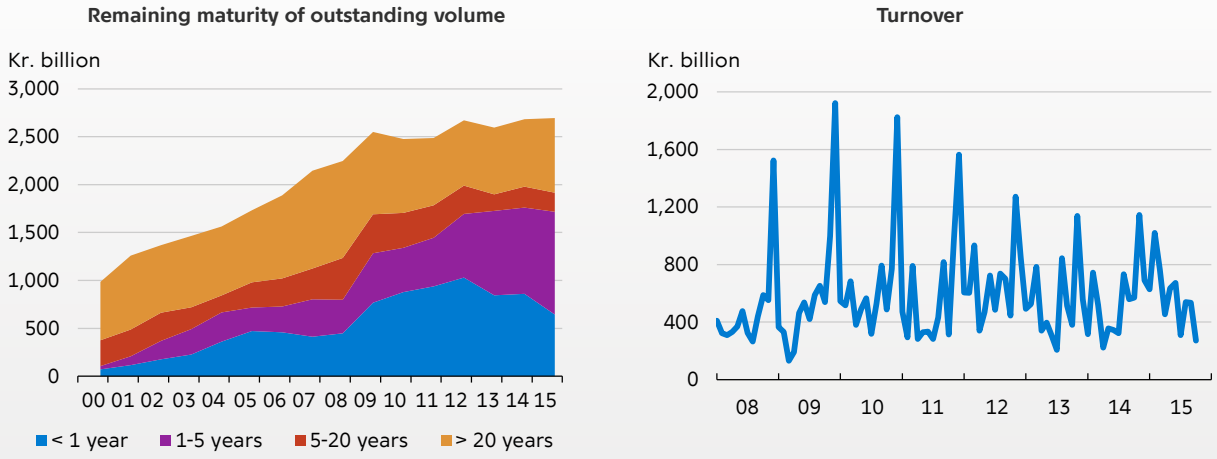
The popularity of adjustable-rate mortgage loans has served to disperse the total outstanding volume on series with different fixed-interest periods and variable interest rates, cf. Chart 3.3 (left). Since the balance principle entails that there must be a direct relation between payments on loans and bonds, the wide range of loan types is reflected in an equally high number of bonds. The principle also means that a bond series cannot be closed as long as borrowers are still repaying loans under the series. This contributes to further increasing the number of outstanding series.

To counter the refinancing risk of 1-year bonds, mortgage banks have, since 2010, sought to spread refinancing auctions on four annual

4 See European Banking Authority (2013), Buchholst, Gyntelberg and Sangill (2010) and Dick-Nielsen, Gyntelberg and Sangill (2012).

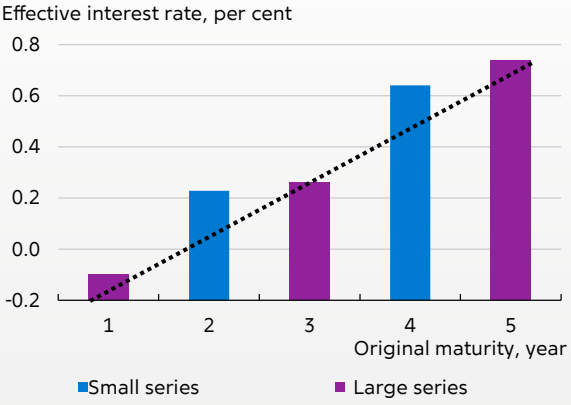
5 Here, Nykredit includes Totalkredit.

Remaining maturity and turnover of mortgage bonds Chart 3.3



Note: The most recent observations in the left-hand chart are from the end of October 2015. The right-hand chart shows the monthly sum of transactions. The most recent observations are from October 2015.
Source: Danmarks Nationalbank, MiFID transaction reports and own calculations.

Premium on small bond series Chart 3.4



Note: The chart shows the effective interest rate on five Realkredit Danmark issuances of SDROs at refinancing auctions in the period 17-18 November 2015. The five SDROs are from the same capital centre and have the same rating. The bond series with 1-year, 3-year and 5-year maturities, respectively, are larger than 500 million euro, while the bond series with 2-year and 4-year maturities are smaller than 500 million euro.
Source: Realkredit Danmark and Nykredit Markets.

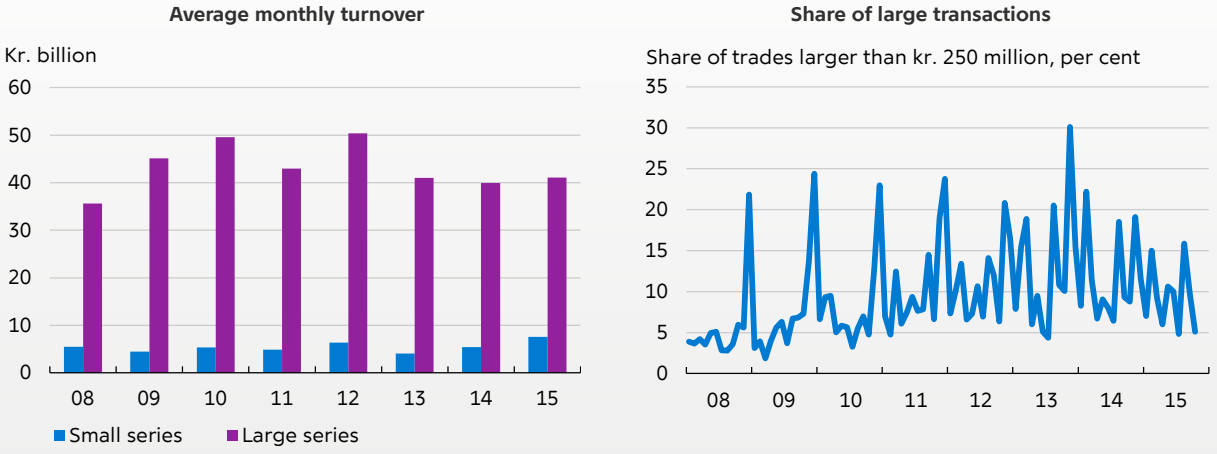
settling periods.[6] This is reflected in the sales of mortgage bonds, cf. Chart 3.3 (right). In recent years, sales have been spread over the year to a greater extent than previously when a very large volume of mortgage bonds was to be sold once a year. In 2014, the legislative amendment on contingent maturity extension of mortgage bonds introduced contingent maturity extension for bonds underlying loans with refinancing. Viewed in isolation, both measures have led to an increase in the number of outstanding series.

Trade in the many small bond series may be challenged in a situation of declining market liquidity. As a result, it may become more difficult to sell the bonds at auction, and it may be more expensive to sell them in the secondary market. Moreover, the new liquidity requirement, the Liquidity Coverage Ratio, LCR[7], which took effect on 1 October 2015, may impact demand across series volumes since the volume in the series affects whether it may be included in the required liquidity buffer. The largest series of at least 500 million euro can be included at a haircut of 7 per cent, while series between 250 and 500 million euro

6 Furthermore, the Supervisory Diamond for mortgage banks contains requirements for limitation of the refinancing risk of each institution with effect from 2010.

7 See European Commission Delegated Regulation (EU) No 2015/61 of 10 October 2014 supplementing Regulation (EU) 575/2013 with regard to liquidity coverage requirement for Credit Institutions.

Turnover of mortgage bonds Chart 3.5



Note: The left-hand chart shows the average monthly turnover. Small (large) series are defined as series with an outstanding volume of less (more) than 500 million euro. The average for 2015 is based only on the period from January until and including October. The most recent observations are from October 2015.
Source: Danmarks Nationalbank, MiFID transaction reports and own calculations.

can be included at a haircut of 15 per cent. Series below 250 million euro cannot be included in the new liquidity requirement. At issuance, demand for these bonds will depend on expectations about the ultimate volume of the series. This was obvious at the refinancing auctions in November 2015 when the bond series expected to belong to a small series were sold with an interest rate premium, cf. Chart 3.4.

Liquidity across series volumes

Market liquidity cannot be measured directly. Therefore, an assessment of liquidity must be based on a number of indicators. One direct way of assessing liquidity in the market for mortgage bonds is to look at the level of trading activity, since a high turnover makes it easier for the individual market participant to buy and sell even large volumes of bonds on an ongoing basis in the market. Moreover, high trading activity helps to ensure that prices are rapidly restored after an order shock.

The concentration of the outstanding volumes of large series is reflected in turnover in the market where transactions in large series account for by far the largest share, cf. Chart 3.5 (left). There is no clear trend of declining turnover, either in large or small series over time.

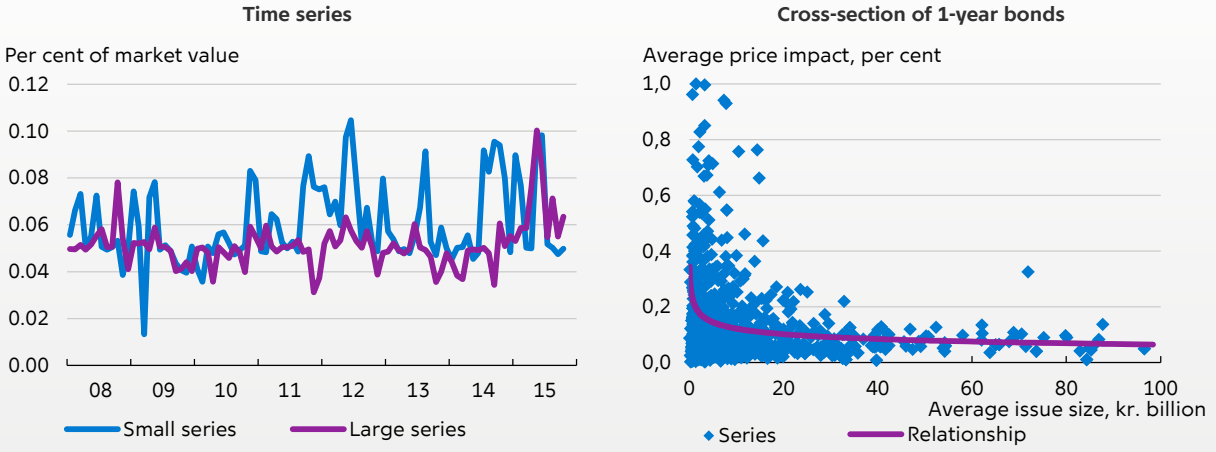
An indication of declining market liquidity could be that market participants no longer execute very large transactions, which has been the case e.g. in the US market for corporate bonds over recent years.[8] However, this trend is not seen in the Danish market for mortgage bonds, cf. Chart 3.5 (right).

In the assessment of market liquidity, another key aspect is the volume of bonds that can be traded at a given price. In a highly liquid market, the execution of even large transactions virtually does not affect the price. Empirically, this dimension of liquidity can be estimated by calculating the price impact of transactions, i.e. the difference between the price from the latest traded price before a transaction to the traded price of the transaction.[9] This measure should be seen as an indicator of market liquidity; it cannot capture all dimensions of liquidity. As a case in point, the indicator does not take into account new information that could change the price between two transactions, nor does it reflect changes in the time and resources spent on executing a transaction.

8 See IMF (2015).

9 See the Appendix for a detailed description of the measure of the price impact of transactions applied.

Price impact of transactions broken down by series volume Chart 3.6



Note: The left-hand chart shows the monthly median of the price impact of transactions. Small (large) series are defined as series with an outstanding volume of less (more) than 500 million euro. A regression analysis has been conducted e.g. of the relationship between price impact and series volume. The purple curve in the right-hand chart shows the statistically significant relationship between price impact and series volume estimated in the model. The relationship is declining with the series volume, but still remains negative for the largest series in the data basis. The most recent observations are from 31 October 2015.
Source: Danmarks Nationalbank, MiFID transaction reports and own calculations.

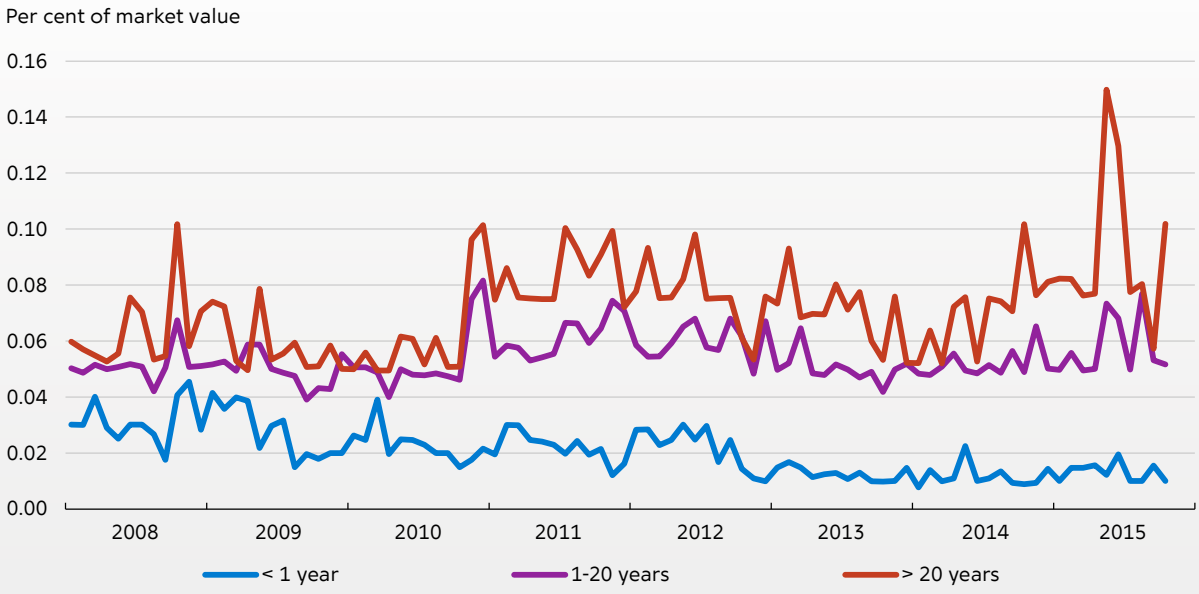
The estimated price impact of transactions in the market for mortgage bonds is still generally low. Viewed over the entire period, the impact is slightly lower for transactions in large series, cf. Chart 3.6 (left), but it seems to grow during periods of increased market volatility, such as the Lehman Brothers collapse in September 2008 and, most recently, in connection with increases in long-term bond yields in the 2nd quarter of 2015. The lower liquidity in small series is most pronounced for the smallest series, while the impact gradually diminishes with increasing volume of the series, cf. Chart 3.6 (right).[10]

REMAINING MATURITY AND LIQUIDITY

Liquidity also depends on the remaining maturities of bonds. Bonds with long remaining maturities generally have high duration, reflecting the price sensitivity of the bonds to interest rate changes. Conversely, bonds with short remaining maturities generally have low duration, since these bonds are set to mature at par within a short time span. Therefore, trading in bonds with long remaining maturities, fluctuating relatively more in value, is more risky. This is reflected e.g. in stronger price impacts of transactions in mortgage bonds with remaining maturities exceeding 20 years than in bonds with remaining maturities of less than 1 year, cf. Chart 3.7. The price impact of bonds with long remaining maturities increased sharply in the 2nd quarter of 2015. This should be seen in the context of a substantial rise in long-term mortgage bond yields during the period, triggered by the increase in long-term yields in the euro area. This caused the duration of callable long-term mortgage bonds to increase – and thus also the interest rate risk of these bonds. The borrower is entitled to redeem callable mortgage bonds at par before maturity. When the price of bonds falls, the expected duration increases with

10 As part of the analyses in this chapter, a regression analysis was conducted of the relationship between the monthly price impact on the individual bond series and its properties in the form of series volume, remaining maturity and ownership concentration. The results of the estimation show e.g. that the price impact is significantly lower, the larger the bond series. The impact is declining with the series volume, but still remains negative for the largest series in the data basis. The other results show that remaining maturity also significantly reduces the price impact, while ownership concentration has no significant impact.

Price impact of transactions broken down by remaining maturity Chart 3.7



Note: The chart shows the monthly median of the price impact of transactions for each remaining maturity segment. The most recent observations are from October 2015.
Source: Danmarks Nationalbank, MiFID transaction reports and own calculations.

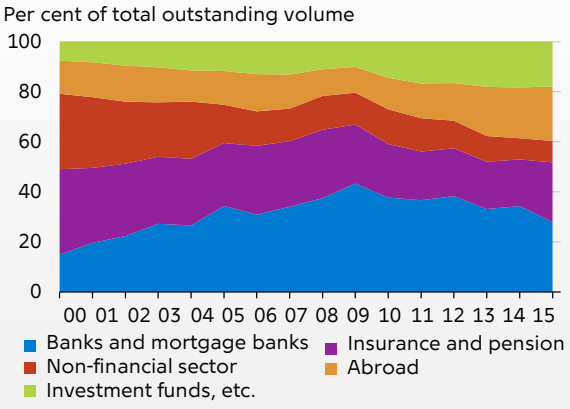
the decreasing probability of redemption of the bonds before maturity.

INCREASE IN THE NUMBER OF FOREIGN INVESTORS

Different types of investors have different investment patterns. Therefore, the investor base in the mortgage bond market may affect bond liquidity. The insurance and pension sector typically holds long-term bonds to maturity to match long-term liabilities, while short-term investors such as banks and foreign investors tend to hold short-term bonds temporarily, for instance for liquidity management purposes. Banks also hold bonds to support market making activities, cf. the section on market conditions below. A large proportion of long-term investors creates stability, but may reduce liquidity in the market. Conversely, short-term investors may increase turnover but also market volatility as a result of frequent behavioural changes.

Since early 2007, the percentage of bonds held by foreign investors, including foreign hedge funds of Danish investors, has increased from just under 10 per cent to just over 20 per cent, cf. Chart 3.8. The financial crisis and the sovereign debt crisis in parts of the euro area led to increased uncertainty and risk aversion, fuelling demand for bonds with high credit ratings such as Danish mortgage bonds.

Mortgage bond investors Chart 3.8



Note: The chart shows observations for the end of October each year. Investment funds, etc. corresponds to the category *Other financial intermediaries, etc.* in the statistics. The most recent observations are from October 2015.
Source: Danmarks Nationalbank and own calculations.

MARKET CONDITIONS AFFECT LIQUIDITY

Liquidity is affected not only by bond properties, but also by market conditions. The development towards reduced risk appetite and increased regulation of the financial sector may affect liquidity. On the one hand, banks have become more resilient. On the other, this development may have reduced banks' provision of liquidity. Moreover, the current situation with accommodative monetary policy and resulting low interest rates could affect liquidity in various ways. While the analysis shows no signs of a decline in the general level of liquidity for mortgage bonds, volatility of the liquidity has been higher since the end of 2014, indicating that liquidity has become less resilient.

HIGHER VOLATILITY IN LIQUIDITY

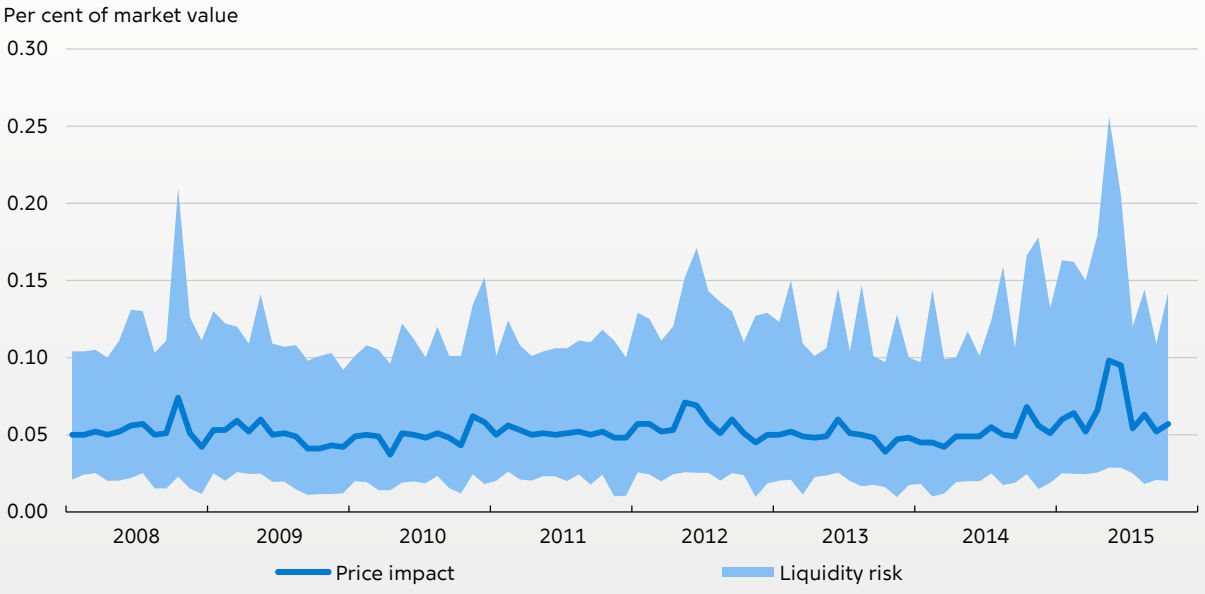
Bonds are primarily traded through banks acting as market makers. This also applies to the market for mortgage bonds. The pivotal role of banks in mortgage bond trading is due to conditions in both the primary and the secondary markets, making it difficult to match buyers and sellers of bonds directly.

In the primary market, the balance principle means that each mortgage loan is financed by a corresponding bond issue; however, investors want to buy large bond volumes at a time. Therefore, banks act as intermediaries between borrowers and investors by purchasing bonds from the issuer on a regular basis and selling them to investors in large blocks.

In the secondary market, banks are available for buying and selling bonds, thus allowing their holdings to absorb imbalances between supply and demand for bonds. This helps to support market liquidity.

Banks' earnings from market making activities are primarily derived from the bid-ask spread, i.e. the difference between the prices at which they buy and sell the bond. They assume risk by taking positions in the market, and this risk is reflected in the size of the bid-ask spread. During periods of financial turmoil, banks' willingness to bear this risk evaporates quickly, causing them to pull out of the market. Liquidity is a public good in the sense that while market participants collectively benefit from high liquidity, it is not necessarily optimal for the individual market participant to supply the amount of liquidity that is optimal for

Liquidity risk Chart 3.9



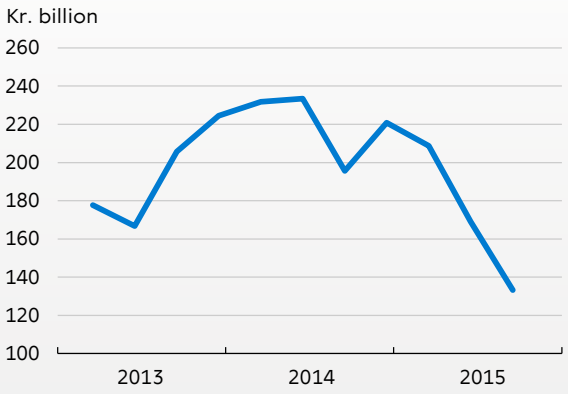
Note: The price impact is given by the monthly median of price impacts of trades across all bond series. Liquidity risk is calculated as the difference between the 3rd and the 1st quartiles of the price impact. The most recent observations are from October 2015.
Source: Danmarks Nationalbank, MiFID transaction reports and own calculations.

the market overall, especially not during periods of financial turmoil.

Thus, market making is not necessarily a guarantee of liquidity resilience in all situations. The variation of the price impact across bond transactions provides an indication of this resilience, i.e. an indication of the potential price impact of a transaction and thus a measure of the liquidity risk. Since the end of 2014 volatility has been higher, indicating that liquidity has become less resilient cf. Chart 3.9. Consequently, smaller shocks than previously may cause liquidity to evaporate.

The liquidity measure shows a temporary sharp contraction in liquidity and a strong increase in risk in the 2nd quarter of 2015. As already mentioned, this should be seen in the context of a substantial rise in the price risk of long-term callable mortgage bonds.[11] Previous periods of substantial changes in interest rates and volatility in long-term yields have not led to the same extent of falls in liquidity in the market for mortgage bonds.

Bank holdings of mortgage bonds for market making purposes Chart 3.10



Note: The chart shows net holdings at market value in Danish kroner, i.e. the total value of long positions less the value of short positions. Mortgage bonds held for repo transactions are not included. The chart is based on a survey conducted among the five largest banks.
Source: Danske Bank, Jyske Bank, Nordea Bank Danmark, Nykredit Bank and Sydbank.

MORE STRINGENT MARKET MAKING FRAMEWORK

Market participants indicate that over recent years, market makers have become less willing to absorb imbalances between supply and demand for mortgage bonds. This should be seen in the context that risk appetite in the financial sector has tended to decline since the financial crisis. This is reflected, inter alia, in increased focus on the source of bank earnings among both credit rating agencies and investors. Generally, earnings from substantial financial market trading activities are assessed more negatively.[12] New regulation in the form of enhanced capital and liquidity requirements has also reduced the potential for risk-taking in banks.

The structural development towards lower risk appetite and increased regulation could lead to a reduction in banks' market making activities. In terms of new regulatory measures, the primary focus is on the leverage ratio and the liquidity requirements LCR and NSFR. The LCR took effect in October 2015, while the NSFR and leverage ratio requirements could be introduced from 2018.

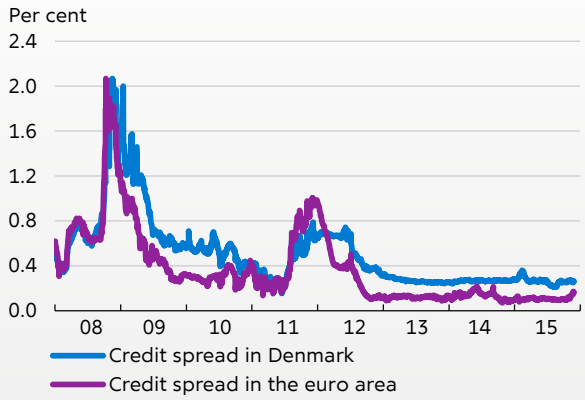
The leverage ratio may contribute to reducing the incentive for banks to hold mortgage bonds on their balance sheets. The reason is that, in contrast to the standard capital requirements, the measure is calculated as a ratio of unweighted exposures. This means that mortgage bonds, which have low risk weights, require relatively more capital under this requirement. Moreover, the LCR and NSFR impose requirements on the composition of banks' balance sheets. For instance, mortgage bonds may at most make up 70 per cent of the liquidity buffer under LCR. As mentioned earlier, the division of series volumes into which bonds can be included in LCR may also affect banks' relative demand for various bond series volumes.

Overall, the development has increased focus on the costs of holding capital and liquidity and could cause banks to find that earnings from

11 A statistical regression analysis shows that changes in the yield on the 10-year Danish government bond are significant drivers of the development in the price impact for bonds with long remaining maturities in the Danish market for mortgage bonds.

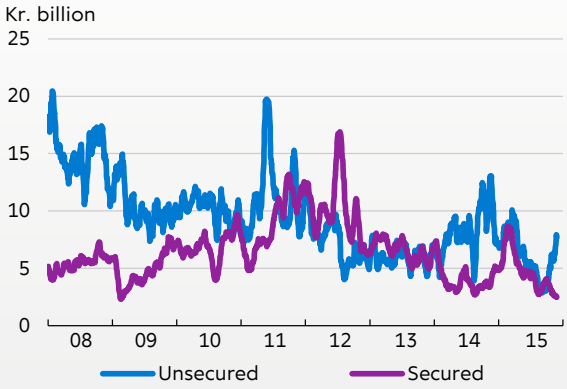
12 See Roengpitya, Tarashev and Tsatsaronis (2014).

Credit spreads for banks Chart 3.11



Note: The chart shows the spread between the 3-month Cibor rate and the 3-month Cita swap rate for the credit spread in Denmark and the spread between the 3-month Euribor rate and the 3-month Eonia swap rate for the credit spread in the euro area. The most recent observations are from 27 November 2015.
Source: Bloomberg, Nordea Analytics and own calculations.

Turnover in the interbank market Chart 3.12



Note: The chart shows the turnover of the current 8 reporters of Tomorrow-Next (T/N) for the entire period. Aggregated across banks and maturities. 21-day moving average of daily observations. The most recent observations are from 27 November 2015.
Source: Danmarks Nationalbank and own calculations.

market marking are no longer sufficient. Internationally, it has been observed that banks have reduced their holdings of bonds for market making since the financial crisis. Over the last year, Danish banks have also reduced their market making portfolios, cf. Chart 3.10.

Significance of the credit markets for market making

To perform the function as market makers and market liquidity providers, banks need access to credit and hedging facilities in the financial markets. This also applies to the market for mortgage bonds where a significant causal relationship can be demonstrated between banks' access to the credit markets and liquidity in the mortgage bond market.[13]

Access to the credit markets depends on the general stability of the financial system, including the banks' own creditworthiness. Banks' access to the credit market cannot be measured directly, but an indicator is provided by the spread between the collateralised interest rate on interest rate swaps and the interest rate on an uncollateralised loan in the interbank market. As a case in point, the credit risk in the interbank market increased during the financial crisis, both in the euro area and in Denmark, reflected in a substantial increase in the spread between collateralised and uncollateralised interest rates during the period, cf. Chart 3.11.

From 2008 until 2012, borrowing in the interbank market shifted from uncollateralised to collateralised, cf. Chart 3.12. Since 2012, turnover of

13 The relationship between banks' access to finance their market making activities and liquidity in the market for mortgage bonds was analysed in Dick-Nielsen, Gyntelberg and Lund (2013). Here, the development in the price impact of transactions is explained by the development in the spread between the 3-month Cibor rate and the 3-month Cita swap rate in the Danish money market. As part of the analyses in this chapter, similar statistical regression analyses were conducted with updated time series. The results from the regressions and tests of Granger causality show, inter alia, that the development in the spread is a significant driver of the development in the price impact for bonds with short remaining maturities in the Danish market for mortgage bonds. The regressions also show that the development in the spread between the 3-month Euribor rate and the 3-month Eonia swap rate in the euro area is a statistically significant driver of the Danish spread.

collateralised loans, such as repo transactions, has dropped considerably.[14] Repo transactions, which are loan transactions against securities as collateral, are widely used for hedging and financing of market maker positions.

Similarly to the way in which structural developments in the form of lower risk appetite and increased regulation can affect banks' willingness to hold mortgage bonds in their portfolios, these developments may also be a factor in the falling turnover in the repo market.[15]

The reduction in banks' inventories of mortgage bonds and the declining turnover in the repo market imply that market making activities will focus on fewer bonds and, in general, be reduced. The result may be a more order-driven bond market. This tendency is generally confirmed by market participants indicating that this is especially the case for bonds that are not issued anymore (off-the-run bonds). Previously, the market was more price-driven, which enabled market participants to trade most bonds relatively easily via market makers at a price level given by the banks' current price quotation. In an order-driven market, transactions will depend more on market makers being able to match buyer and seller directly. Transactions may become more time-consuming in an order-driven market, depending on how often a bond is traded.

Yield on 10-year government bond Chart 3.13

Note: The most recent observations are from 27 November 2015.
Source: Danmarks Nationalbank and Bloomberg.

ACCOMMODATIVE MONETARY POLICY CAN SUPPORT LIQUIDITY

Central bank bond purchases in the USA and the euro area directly support liquidity, since central banks are large and predictable buyers in the market. The purchases reduce the volume of bonds available to other investors, which could reduce liquidity in certain bond types. Moreover, the accommodative monetary policy has triggered a search for yield, which may have increased demand for low liquidity assets. This helps to explain why growing concerns over market liquidity do not affect liquidity premiums, which remain low. There is a risk that liquidity may decrease when, at some point, monetary policy normalises. It is essential that market participants are aware of this and that normalisation is as transparent as possible.

LIQUIDITY MAY BE NEGATIVELY IMPACTED BY LOW INTEREST RATES

The current low interest rate environment may have a negative impact on mortgage bond liquidity. That is because low interest rates may induce market makers to increase their bid-ask spreads, translating into lower market liquidity, cf. Box 3.1. One reason is that the current level of interest rates influences banks' expectations in terms of future developments in interest rates.

The level of interest rates in Denmark has generally been declining since 2008, cf. Chart 3.13. In the first part of the period during which interest rates were falling, expectations of further interest rate reductions may have caused market makers to expect price rises on their mortgage bond portfolios. All else equal, capital gains from mortgage bonds provide an incentive for market makers to hold mortgage bonds in their portfolios for market making.

Conversely, when interest rates are below their long-term levels, market makers will expect future interest rate increases and price falls. This may

14 For a description of the relationship between monetary policy interest rates and the turnover of uncollateralised loans in the interbank market, see Danmarks Nationalbank (2014).

15 See Danmarks Nationalbank (2015).

have caused them to reduce their activities and widen their bid-ask spreads. In early 2015, interest rates reached a new trough. Viewed in isolation, this may have contributed to increasing the price impact of transactions during the period.

Market liquidity and market making at low interest rates

Box 3.1

Developments in market liquidity depend, inter alia, on interest rate developments. The reason is that banks' expected costs and returns from market making activities depend on the level of interest rates. Based on a theoretical model, Kristoffersen and Pedersen (2015) show that market liquidity may be lower in a low interest environment like the current one than at a higher level of interest rates.

How is the bid-ask spread determined?

The analysis in Kristoffersen and Pedersen (2015) is based on a model of the determinants of market liquidity measured by market makers' bid-ask spread. A wide spread means that it is expensive for buyers and sellers to operate in the market, which contributes to reducing liquidity.

The model is based on two key assumptions about the market structure in the bond market. Firstly, market makers generally hold positive bond inventories to be able to provide liquidity. It is assumed that they cannot fully hedge the risk of the inventories. Secondly, it is assumed that perfect competition exists between market makers, meaning that all market makers have the same bid-ask spread and buy or sell orders received. Under these assumptions, the bid-ask spread is essentially determined by two factors; the expected costs of market making and the expected, risk-adjusted return on the inventory.

The relationship between market makers' expected, risk-adjusted return and the bid-ask spread depends on market makers' return requirements relative to those of other investors in the bond market. The results below on market making in a low interest rate environment are based on the assumption that market makers require a smaller risk-adjusted return than other investors in the bond market. This may reflect that, on average, they have more capacity to assume risk than, say, firms and households. It is not a prerequisite for market makers to be indifferent to risk. They just have to be more willing to assume risks than the rest of the bond market.

Market making in a low interest rate environment

To be able to analyse how the returns of market makers are affected in a low interest rate environment, Kristoffersen and Pedersen (2015) extend the model with a specific interest rate structure, based on the so-called CIR model. The properties of this interest rate model are e.g. that short-term interest rates fluctuate around a long-term interest rate level and have an explicit lower bound. This means that the volatility of short-term interest rates depends on the interest rate level. In other words, fluctuations in short-term interest rates are greater when short-term interest rates are high. This assumption is supported by empirical studies.

In the extended model, analysis results indicate that a lower interest rate level leads to a wider bid-ask spread, and thus lower market liquidity. The reason is that lower interest rates lead to a lower risk-adjusted return for market makers, since the volatility of short-term interest rates is lower. Viewed in isolation, a lower risk-adjusted return reduces market makers' earnings from their liquidity supply. To compensate for lower returns, they need to widen the bid-ask spread to cover a given level of costs.

Moreover, expectations of capital losses may affect the bid-ask spread. When interest rates are below their long-term levels, market makers will expect interest rates to rise. A clear example of this is at the zero lower bound on interest rates from which level interest rates can only rise, and market makers expect the bond price to decline in the future. Thus, market makers must expect to incur a loss on their bond holdings. They will demand compensation for the expected loss through a higher bid-ask spread.[1]

The results above assume that the assets traded are zero coupon bonds. If instead the bonds were coupon bonds, the duration, or price sensitivity to changes in interest rates, would automatically increase as interest rates decrease. Other things being equal, this will tend to reinforce the results above.

1. Kristoffersen and Pedersen (2015) also show that, viewed in isolation, the bid-ask spread is higher at the zero lower bound on interest rates if market makers are explicitly assumed to be risk-averse, i.e. more concerned about negative price changes than about positive changes. This channel may negatively affect liquidity even if market makers require the same risk-adjusted returns as other investors in the bond market.

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APPENDIX

The analyses in this chapter are based on detailed information on transactions in the mortgage bond market from MiFID transaction reports. The MiFID directive[16] entails that, since November 2007, all investment firms and credit institutions in the EU have had an obligation to report securities transactions to their national supervisory authorities. The transaction reports contain information on volumes, prices and dates of mortgage bond transactions. Moreover, all bonds have unique ISINs in the MiFID reports, making it possible to add information e.g. about the outstanding volumes and maturities of the bonds sourced from the Danmarks Nationalbank's Securities Statistics.

DATA PROCESSING

The MiFID transaction reports are essentially a supervisory tool for the Danish Financial Supervisory Authority. To target the data basis for the purpose of the analysis, multiple filterings were performed before data was used in the analyses. Data was processed through five filters described in Table 3.B.1.

The original data set consists of approximately 8 million observations, while data after the first four filters contains about 6 million observations. In the final filter in which retail transactions are filtered out, most transactions are excluded; however, the transactions excluded account for only about 10 per cent of total turnover.

In the data set used, all transactions have been anonymised so that the analysis does not focus on counterparty level.

CALCULATION OF THE PRICE IMPACT OF TRANSACTIONS

The calculation of the price impact of transactions is based on the filtered data. In most international

16 Directive 2005/39/EC of the European Parliament and of the Council, Article 25(3) and (4).

Filtering of MiFID data

Table 3.B.1

Step	Filter	Background
1	Repo transactions are excluded.	Information on mortgage bond transactions executed as part of repo transactions may distort the empirical measures of market liquidity.
2	Double reporting is excluded.	Transactions between reporters are reported by both sides of the transaction.
3	Transactions without information in Danmarks Nationalbank's Securities Statistics are excluded.	Information from Danmarks Nationalbank's Securities Statistics is necessary to classify the bonds.
4	Error reporting is excluded.	Transactions for which at least one of the following conditions apply are assessed to be incorrect: • The price is lower than 50 or higher than 160. • The price deviates by at least 5 price points from the previous traded price. • The nominal value of the transaction is higher than the total volume issued. • The traded price is reported in a currency other than Danish kroner.
5	Transactions for less than kr. 10 million are excluded.	The analysis focuses on the transactions of institutional investors. Consequently, the large number of small retail transactions made in connection with individual mortgage loans are excluded.

studies, the price impact is adjusted for transaction volume. However, several studies based on Danish data have not found the expected positive relationship between price impact and transaction volume.[17] A regression analysis of the data basis for this chapter shows the same result. Therefore, the price impact is not adjusted for transaction volumes in the analyses.

The price impact of a transaction is calculated as the numerical percentage change in the traded price (P) for bond (k) on day (t) for transaction (i),

$$\text{Price impact}_{k,t,i} = \frac{|P_{k,t,i} - P_{k,t,i-1}|}{P_{k,t,i-1}} \times 100$$

To make it less likely that prices between two transactions change for reasons other than the price impact of the transaction, e.g. release of new information to the market, only the price impact of transactions executed on the same day as the previous transaction is included. Moreover, observations with zero price impact are excluded.

17 The analyses in both Dick-Nielsen, Gyntelberg and Sangill (2012) and Dick-Nielsen, Gyntelberg and Lund (2013) find that the price impact of transactions in the market for mortgage bonds is approximately the same for various transaction volumes.

4

NEW RECOVERY AND RESOLUTION REGIME

INTRODUCTION AND SUMMARY

During the most recent financial crisis, a number of distressed European credit institutions were rescued by means of government funds. Government intervention was necessary in order to ensure continuation of financial system functions that are critical to the real economy and performed by systemically important institutions. Households, firms and authorities all depend on many of the services provided by the institutions. Insolvency whereby these critical functions are disrupted will have considerable negative consequences for financial stability and the real economy.

In the absence of a framework regulating the authorities' management of a distressed institution without such consequences, a number of governments had to intervene. This involved financial support to distressed institutions – and hence their owners and creditors, i.e. *bail-out*. However, bail-out is a costly solution entailing substantial risks for the government and an inappropriate incentive structure for the largest institutions. Expectations of a bail-out tend to offset institutions' incentives for responsible business operation and the incentives of investors and creditors to monitor the institutions' activities with a view to preventing excessive risk-taking, which could damage their investment. The funding costs of the largest institutions are kept artificially low, since credit rating agencies and investors factor in an implicit government guarantee for these institutions. This contributes to distorting competition.[1]

The new EU framework on recovery and resolution of credit institutions, the BRRD[2], gives the resolution authorities a number of measures and

1 In Denmark, the government also had to intervene during the financial crisis for the reasons mentioned. With Bank Rescue Package 1 (October 2008) the government provided a government guarantee together with the financial sector regarding all unsecured claims on banks until 30 September 2010. Bank Rescue Package 2 (February 2009) gave banks and mortgage banks access to apply for government capital injections (Additional Tier 1 capital), and a scheme was introduced which made it possible for Danish credit institutions to apply, until 31 December 2010, for individual government guarantees for specific issuances with maturities of up to 3 years.

2 The Bank Recovery and Resolution Directive, i.e. Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms and amending Council Directive 82/891/EEC and Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC, 2011/35/EU, 2012/30/EU and 2013/36/EU and Regulations (EU) No 1093/2010 and (EU) No 648/2012 of the European Parliament and of the Council. The deadline for implementation was 1 January 2015, but, at the time of writing, not all EU member states have implemented the Directive.

tools enabling resolution of any institution irrespective of its size and functions. The fundamental principle is that those who have assumed the risks, i.e. the owners and creditors of the distressed institution, are to bear the losses to the extent that it is possible to restructure or resolve the institution without any significant adverse impact on financial stability and without using government funds. This is ensured by writing down or converting the claims of owners and creditors to the extent necessary, i.e. *bail-in*.

Part of the new framework still remains to be implemented. This relates to the authorities' resolution plans and determination of a requirement for the institutions to have sufficient liabilities that are eligible for absorbing losses in a resolution situation. This work is essential if the tools are to be available for the intended use in a specific situation, and thus also essential for a robust and credible resolution regime in practice. This is necessary in order to avoid future pressure on governments for bail-out of systemically important institutions.

However, mortgage banks, which are systemically important, do not need to meet individual requirements for the level of liabilities eligible for loss absorption, and it is not possible to use the bail-in tool in connection with resolution of a mortgage bank. It is important to clarify how to ensure, in practice, that mortgage banks can be resolved in accordance with the resolution objectives.

The second part of the new recovery and resolution regime ensures better crisis prevention in the institutions themselves, in the form of recovery plans, and better opportunities for intervention by supervisory authorities in the event of signs of an emerging crisis with a view to restoring the institution's situation.

Danmarks Nationalbank acts as the lender of last resort. This entails, among other factors, that Danmarks Nationalbank can grant emergency liquidity assistance, ELA, to a solvent credit institution with an urgent need for liquidity. In this connection, Danmarks Nationalbank will assess whether the consideration of financial stability justifies ELA. Danmarks Nationalbank expects any institution with liquidity problems to be able to take the necessary steps on its own – to a far higher degree than previously – to redress its liquidity situation.

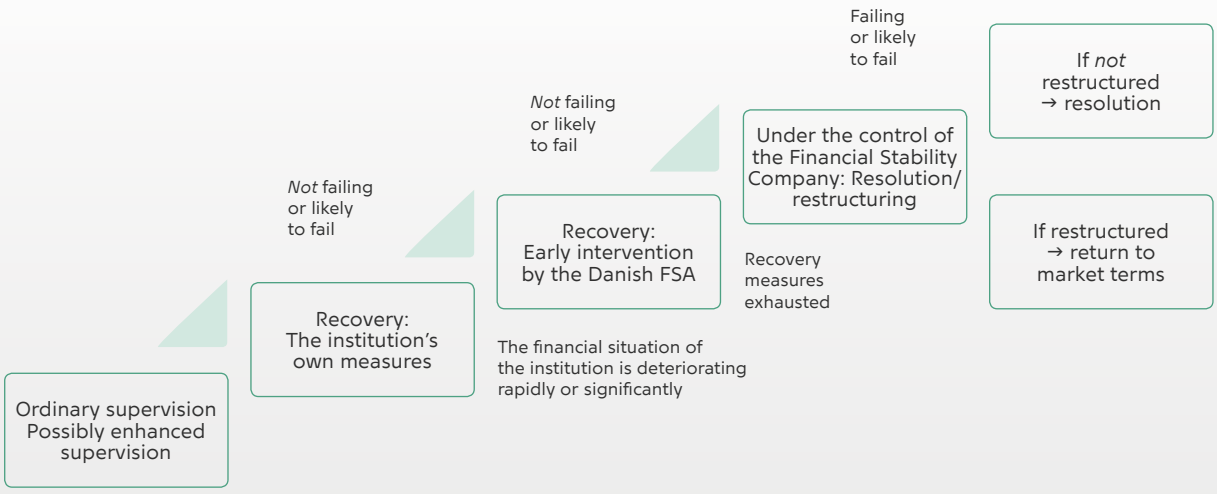
NEW EU FRAMEWORK ON RECOVERY AND RESOLUTION OF CREDIT INSTITUTIONS

The BRRD establishes a common framework for the management of distressed credit institutions across the EU.[3] The BRRD has been implemented into Danish law partly by amendment to the Financial Business Act and to the Financial Stability Act, partly by a new Act on Restructuring and Resolution of Certain Financial Enterprises, which entered into force on 1 June 2015. The BRRD framework replaces and supplements the special Danish resolution model, which was introduced by Bank Rescue Package 3. Hence, the authorities now have a number of new tools enabling them to manage systemically important institutions, SIFIs, too without any significant adverse impact on financial stability and without a need for public funds.[4] Furthermore, the new regime ensures that

3 The Danish BRRD legislation applies to banks, mortgage banks, investment firms I, financial holding companies and financing institutions, and the rules must be observed at both institution and group level. In the following, they are collectively referred to as "institutions".

4 This was not the case with the special resolution scheme which was introduced with Bank Rescue Package 3 (the "Exit Package"), and under which depositors and other unsecured creditors were no longer guaranteed full cover (as had been the case under Bank Rescue Package 1). The Financial Stability Company's takeover of a failing institution under Bank Rescue Package 3 could ensure that depositors would not see any difference in the practical management of their banking transactions, i.e. depositors could still use payment cards, online banking, etc. immediately after the takeover of the institution by the Financial Stability Company. However, the Financial Stability Company's tools under Bank Rescue Package 3 were never intended to be applied to resolution of a SIFI, which is also acknowledged in the political agreement on regulation of systemically important institutions of 10 October 2013 (Bank Rescue Package 6).

Phases of recovery and resolution of an institution in difficulties Chart 4.1



the resolution principles are the same for Danish SIFIs as for other similar European institutions.

Firstly, the framework includes a number of recovery tools to prevent emerging difficulties in an institution from escalating into a crisis. Secondly, it stipulates how an institution is to be managed if the recovery measures prove to be insufficient in a specific situation so that the institution is not viable anymore. In such case, the institution is regarded as *likely to fail or failing* and must be resolved or restructured, unless a private sector solution can be found.

Specifically, the concept of failing or likely to fail means that the institution infringes or is likely in the near future to infringe the requirements for continued authorisation. For example, an institution may be failing in the event of non-compliance with a capital or liquidity requirement in the Capital Requirements Regulation or Directive, CRD IV/CRR. The institution will be likely to fail if there are objective elements to support a determination that the institution will, in the near future, infringe such a requirement for continuing authorisation.

The BRRD contains requirements to the effect that each institution must draw up and maintain a recovery plan, and that the resolution authority must draw up a resolution plan. These plans form the basis of the recovery and resolution measures of the institutions and authorities. If an institution infringes or is bordering on infringing a requirement for continuing authorisation, but is not found to be failing or likely to fail, it must first implement one or more of the measures set out in the recovery plan with a view to redressing its financial situation. If, at some point, the institution is no longer viable, it must be subject to resolution, cf. Chart 4.1.

This chapter focuses on the future work regarding implementation of the resolution framework in relation to the recovery and resolution phases. The first part of the chapter discusses the possibilities of recovery of an institution in difficulties, including Danmarks Nationalbank's role as provider of emergency liquidity assistance, viewed in the light of the new regime. The second part of the chapter focuses on the implementation of the framework in the form of resolution planning and determination of a requirement for the institutions to have sufficient liabilities that are eligible for loss absorption in a resolution situation.

RECOVERY OF INSTITUTIONS IN DIFFICULTIES

RECOVERY PLANS

Each institution must draw up and update a recovery plan containing measures to be implemented in order to restore the institution's capital or liquidity in a crisis situation. This is a management tool designed to prevent the problems of an institution from becoming so serious that resolution is the only way out. It is the responsibility of each institution to ensure that the recovery plan is credible and to update it on an ongoing basis.

Critical functions[1]

Box 4.1

In financial institutions, critical functions are activities, the sudden discontinuance of which must be expected to have an adverse impact on the real economy or on financial stability. For systemically important institutions, the assessment of whether – and to which extent – a function is critical can be based on a three-step analysis:

- To which extent are third parties affected if the function is disrupted ("impact assessment")?
- How concentrated is the market for the given function, and are clear substitutes available ("supply side analysis")?
- How critical is the individual institution as regards performance of the function ("firm-specific test")?

If a critical function is discontinued, third parties may be affected either directly or indirectly via secondary effects. The direct effect can be through a customer relation or other direct exposure. For example, critical functions may relate to payments, clearing and settlement, money markets and foreign exchange markets or an institution's role as key supplier of certain services in a market. Another example is lending. If an institution is e.g. suddenly unable to grant credit or provide the necessary liquidity facilities to its customers, this may mean that the customers will be unable to honour their obligations to creditors and suppliers. There is a direct impact on customers and an indirect impact on their creditors and suppliers who are otherwise not exposed to the institution.

Another example of an indirect effect is where an institution is market maker in a market, but suddenly disappears from the market. This may cause liquidity in that market – and hence prices – to drop. Falling prices could lead to fire sales and further decrease in prices. The declining liquidity, lower prices and more pronounced volatility may have a contagion effect on the liquidity and solvency strength of other institutions and players to the extent that they are exposed to the market in question – even though they are not directly exposed to the key player. The contagion can thus spread further in the financial and real economic system.

The second step in the assessment of the criticality of a function is whether the function can be substituted within a reasonable timeframe and without considerable costs. This could happen if another market participant takes over the function or the function is substituted by another function, e.g. another product. To the extent that this is possible and the effects on the real economy and financial stability can thus be mitigated, the function will not be critical.

Institutions can be regarded as systemically important if they perform functions that are critical, e.g. due to the individual institution's size, market share, interconnectedness or complexity. The larger the institution and the larger its market share for a given function, the greater the expected consequences to financial stability and the real economy of the institution's sudden discontinuance of the function. The effects take place via the institution's interconnectedness to players inside and outside the financial system.

The extent to which a function is critical to financial stability and the economy is not static, and neither is the systemic importance of a specific institution carrying out the function. This changes in step with changes in the real economy and the financial sector. It is thus important to analyse, identify and monitor current critical functions on an ongoing basis.

1. The term *critical functions* is described in more detail in Financial Stability Board: *Recovery and Resolution Planning for Systemically Important Financial Institutions: Guidance on Identification of Critical Functions and Critical Shared Services*. See also EBA: *Technical advice on the delegated acts on critical functions and core business lines* (EBA/op/2015/05), March 2015.

SIFIs already had experience of drawing up recovery plans under the previous rules, but the new rules stipulate considerably more extensive requirements for recovery plans.[5] In accordance with the principle of proportionality, small banks are to draw up simplified recovery plans. Non-SIFIs are classified into three categories according to total balance sheet, subject to recovery plan requirements in descending order. For the smallest banks, it is thus sufficient to submit a capital raising plan supplemented by a number of capital indicators.

In October 2015, the SIFIs submitted recovery plans to the Danish Financial Supervisory Authority, FSA, under the new rules, while other institutions must do so by 1 January 2016.

The recovery plan is to ensure timely implementation of the measures that the institution may initiate to redress its financial situation in the event of difficulties. Hence, the plan must describe realistic recovery measures in various scenarios with severe macroeconomic and financial stress. In order to ensure that the recovery plan is credible, these scenarios must be relevant to the individual institution and relate to the institution's critical functions, cf. Box 4.1. The scenarios must comprise idiosyncratic stress situations where

5 Cf. Executive Order No. 724 of 27 May 2015 on recovery plans for banks, mortgage banks and investment firms I.

only the institution in question is affected (e.g. reputation risk or failure of an important counterparty), systemic stress situations where the entire financial system is affected (e.g. a drop in market liquidity or a macroeconomic downturn) or combinations of the two.

The scenarios must be sufficiently severe to cause the institution to fail, unless recovery measures are implemented in a timely manner. In their recovery planning, the institutions should not assume access to extraordinary central bank facilities, including Emergency Liquidity Assistance, ELA, cf. the section below.

The institution sets out a number of quantitative and qualitative indicators in its recovery plan, which are to be calculated and monitored on an ongoing basis. In the event of breach of an indicator, the institution must notify the Danish FSA as soon as possible about its decision to possibly initiate recovery plan measures. The choice of indicators must match the size, business model, strategy and risk profile of the institution. As a minimum, the recovery plan is to include indicators of capital, liquidity, profitability and asset quality. A capital indicator can be e.g. the Common Equity Tier 1 ratio or leverage ratio, while examples of liquidity indicators are the Liquidity Coverage Ratio, LCR and the Net Stable Funding Ratio, NSFR. In addition, the institutions are to include, to the relevant extent, market-based indicators, such as credit rating and CDS spread, and macroeconomic indicators, e.g. GDP fluctuations and credit spreads on government exposures.

The recovery plan is to be approved by the institution's board of directors and submitted to the Danish FSA for assessment. If, after consultation with the Financial Stability Company, the Danish FSA finds that there are material deficiencies in the recovery plan, or that there are material impediments to its application, the institution must draw up a revised plan. If the revised plan does not sufficiently accommodate the criticism of the Danish FSA, the Danish FSA is authorised to order the institution to e.g. reduce its risk profile, change its funding strategy or change its management structure.

The European Banking Authority, EBA, has reviewed the recovery plans of 19 European credit institutions, corresponding to one third of the assets in the EU banking sector, and finds substantial variation in the institutions' progress towards compliance with the new framework for drawing up scenarios in their recovery plans.[6] Among other factors, the EBA points out the scarce quantitative and qualitative descriptions of the scenarios and scarce descriptions of the effect of realisation of the scenarios in some of the recovery plans, which makes it difficult to assess the severity of the scenarios. Moreover, it is stated that coherence between the recovery plan's scenarios, indicators and recovery options is not found in all cases. The EBA report underlines the importance of a thorough review of and dialogue with the institutions about the recovery plans to ensure that they are credible and realistic.

EARLY INTERVENTION AND FURTHER INTERVENTION POWERS

If an institution's financial situation is deteriorating rapidly or considerably, the Danish FSA now has a number of further early intervention powers with a view to redressing the institution's situation, cf. the "early intervention" phase in Chart 4.1. The closer an institution comes to resolution, the more extensive the recovery measures to be applied. For example, the Danish FSA may order the institution to implement its recovery plan or draw up and submit another action plan for solution of identified problems within a given deadline. The Danish FSA also has powers to require the resignation of one or more members of the institution's board of directors or board of management, or to order the institution to draw up a plan for negotiation on debt restructuring. Furthermore, the Danish FSA may order the institution to change its business strategy or contact potential buyers in preparation for resolution.

If the Danish FSA finds that these measures are not sufficient to redress the financial situation of the institution, the Danish FSA may appoint an administrator to assist the board of directors or replace the entire board of directors. An administrator may be appointed for a term of up to one year, which may be extended under special circumstances.

6 EBA: "*Comparative report on the approach taken on recovery plans' scenarios*", December 2015.

Moreover, in this phase the Danish FSA must write down or convert – fully or in part – any Additional Tier 1 and Tier 2 capital instruments if the institution would otherwise not be viable. A precondition is that the Common Equity Tier 1 capital instruments have already been fully exploited for loss absorption. This power, which interferes with the owners' right of decision prior to a decision on resolution, should be assumed not to be exercised until the point where the institution would otherwise be very likely to lose its authorisation.

EMERGENCY LIQUIDITY ASSISTANCE

The new recovery and resolution regime ensures better crisis prevention in the institutions themselves as they have to draw up and maintain recovery plans. Consequently, if an institution encounters liquidity problems, it should be expected – to a far higher degree than previously – to be able to take the necessary steps on its own to restore its liquidity situation. The need for institutions to raise emergency liquidity assistance from Danmarks Nationalbank should therefore be smaller than previously.

Danmarks Nationalbank may grant ELA on special terms to a solvent credit institution that urgently needs liquidity and cannot procure it in the market. ELA is granted as an element of compliance with Danmarks Nationalbank's objective to contribute to financial stability. In future, granting of ELA should be viewed in the context of the new recovery and resolution regime which entails a clear distribution of roles for the authorities.

If an institution applies for ELA, Danmarks Nationalbank will assess whether the consideration of financial stability justifies ELA in the situation at hand. This assessment should be regarded in the light of the Financial Stability Company's resolution tools to ensure continuation of the institution's critical functions and prevent a resolution from causing financial instability, cf. the section on resolution below. The assessment will also depend on the specific circumstances at the time when an institution encounters liquidity problems, and it will e.g. comprise the possible consequences for the payments infrastructure and the interbank market. No institutions are precluded from ELA in advance.

As a precondition for granting ELA, Danmarks Nationalbank must receive adequate collateral for the full amount. Typically, the assets that an institution with liquidity problems would be able to pledge will not be comprised by Danmarks Nationalbank's general collateral basis. When determining haircuts, Danmarks Nationalbank will take into account these higher risks.

For each application for ELA, Danmarks Nationalbank as lender will assess whether the institution is solvent and creditworthy and whether the institution is thus found to be able to repay the loan on expiry. The assessment of the institution's debt servicing ability is related to the development in its capital and liquidity situation throughout the maturity of the loan. In its supervisory capacity the Danish FSA is monitoring institutions closely, and Danmarks Nationalbank will naturally draw on the Danish FSA's expertise in its assessment of an application for ELA.

ELA can be used in relation to individual institutions under specific circumstances, whereas Danmarks Nationalbank's general instruments (monetary policy loans) are offered to all monetary policy counterparties on the terms and conditions in force at any time. If several institutions are facing liquidity problems at the same time, e.g. due to a general freeze of the financial markets, Danmarks Nationalbank may decide to expand the institutions' access to loan facilities for financial stability reasons. Such a general instrument offered to all monetary policy counterparties is not characterised as ELA.

FRAMEWORK FOR RESOLUTION OF FAILING SIFIS

PARADIGM SHIFT

The second part of the new recovery and resolution regime consists of a framework for authorities' management of an institution that is failing or likely to fail, including special rules on who will bear the losses and how. The Danish Act on Restructuring and Resolution of Certain Financial Enterprises[7] empowers the Financial Stability Company, as the resolution authority, to take

7 Act no. 333 of 31 March 2015.

timely control of a failing institution with a view to continuation of the institution's critical functions and hence minimise the impact on financial stability and the real economy, cf. Box 4.1. Funds for covering losses and recapitalising the restructured institution are ensured by write-down or conversion into ownership instruments of equity, other capital instruments and unsecured claims to the extent necessary, cf. Chart 4.2, which shows the bail-in hierarchy.[8]

In Danmarks Nationalbank's view, it is of major importance to financial stability that resolution of a failing SIFI or a SIFI likely to fail will be possible in future under this principle and using the new resolution tools available to the authorities. SIFIs are indeed institutions, the uncontrolled insolvency of which would have a significant adverse impact on the financial system and the real economy.[9] It should be noted that the concept of *resolution* in relation to SIFIs entails restructuring, since the purpose is to continue the functions that are critical to society.

Thorough and realistic resolution planning will determine whether it will be possible actually to resolve SIFIs without any considerable systemic effects and without the use of public funds.

Resolution objectives and resolution tools

The intention of the new resolution regime is expressed in the legislation as five *resolution objectives* which must be taken into account in the Financial Stability Company's choice and application of resolution tools:

1. To ensure the continuity of critical functions, the disruption of which may be expected to have a significant adverse impact on financial stability or on services that are vital to the real economy.
2. To avoid a significant adverse impact on financial stability, especially by preventing contagion, including to market infrastructures, and by maintaining market discipline.
3. To protect public funds by minimising the reliance on extraordinary public financial support.
4. To protect depositors and investors.
5. To protect client funds and client assets.

The *bail-in tool* is the key resolution tool to ensure that the resolution objectives are met in the management of a failing institution or an institution likely to fail. In order to enable, in practice, application of the tool as intended, the institutions must at all times meet a requirement for sufficient liabilities that are eligible for absorbing losses in a resolution situation, i.e. *eligible liabilities*, MREL[10], cf. below. The bail-in tool may be used alone (for continuation of the legal entity under resolution) or combined with the other resolution tools, *sale of business*, *bridge institution* and *asset separation*.[11]

The *sale of business tool* gives the Financial Stability Company the power to sell all or parts of the failing institution to a commercial purchaser. Generally, the sale is to be carried out on commercial terms, in consideration of the circumstances of the situation, and must be in accordance with the rules on state aid.

The *bridge institution tool* gives the Financial Stability Company the power to transfer all or parts of the failing institution to a bridge institution owned by the Financial Stability Company or the Resolution Fund with the aim of continuing critical functions and divesting the institution, generally within 2 years. The total value of the transferred liabilities must not exceed the value of the assets.

8 The introduction of the bail-in tool has prompted several credit rating agencies to downgrade a number of SIFIs due to the lower probability of state aid. This has reduced the difference in funding costs between big and small institutions, since SIFIs are no longer considered "too big to fail", cf. inter alia Bank of England, *Quarterly bulletin,* 2015 Q3, Bank failure and bail-in: an introduction.

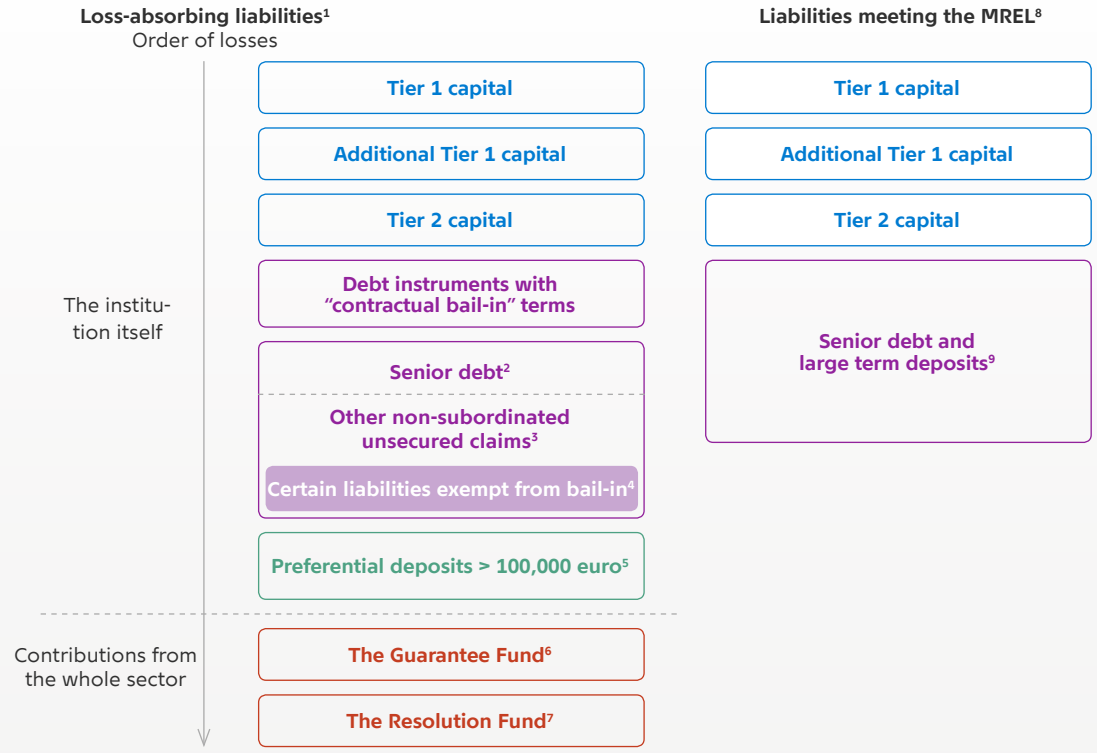
9 Cf. inter alia Financial Stability Board, *Policy Measures to Address Systemically Important Financial Institutions*, 4 November 2011.

10 MREL stands for "minimum requirement for own funds and eligible liabilities".

11 The new framework is being used in the resolution of Andelskassen J.A.K. Slagelse, cf. the Financial Stability Company's decisions of 5 October 2015 on exercising control and implementing resolution measures (bail-in and setting up a bridge institution). The conditions for resolution were thus assessed to be met, including that consideration of the public interest made it necessary to implement resolution measures, taking the resolution objectives into account. This is in accordance with the approach in the Danish implementation of the BRRD, under which it should be considered important that customers, in the event of resolution (as opposed to insolvency), can access their funds immediately after implementation of resolution measures and that they avoid cancellation of their loans and do not need new payment cards, etc., cf. the explanatory notes for section 5 of the Danish Act on Refinancing and Resolution of Certain Financial Enterprises.

Bail-in hierarchy and eligible liabilities

Chart 4.2



1. Write-down/conversion (in the following called "bail-in") of liabilities is to cover losses and recapitalisation of the institution to the extent necessary. Bail-in must be according to the creditor hierarchy in insolvency, i.e. all creditors in each creditor class must (as a general rule) be treated equally, and the claims of all creditors in one class must be fully written down/converted before write-down/conversion can be made in the next creditor class.
2. Senior debt is non-subordinate loan capital and ranks before subordinated claims in the event of insolvency.
3. That is: liabilities related to derivatives transactions, money market instruments, deposits from other financial corporations and large firms, etc.
4. Among others, this applies to (i) liabilities to banks and mortgage banks with an original maturity of less than 7 days (unless they are intra-group liabilities) i.e. unsecured money market loans; (ii) liabilities with a remaining maturity of less than 7 days to payment and settlement systems as a result of participation in the system in question; (iii) certain liabilities to employees (salary and pension payments); and (iv) liabilities towards trade creditors relating to delivery of goods and services of vital importance to the institution's day-to-day operation. In special circumstances, the Financial Stability Company may exempt certain senior liabilities or a category hereof on the basis of a specific assessment.
5. The BRRD introduces a special priority ranking for deposits exceeding 100,000 euro from natural persons, micro, small and medium-sized enterprises. Covered deposits are completely exempt from bail-in.
6. The Guarantee Fund, now administered by the Financial Stability Company, is to contribute to financing the resolution with an amount corresponding to the amount of write-down of the depositors' covered deposits if they had been comprised by bail-in. The contribution from the Guarantee Fund may not exceed 100 per cent of the target level set for the Guarantee Fund.
7. The Resolution Fund may contribute an amount equivalent to 5 per cent of the institution's total liabilities, but only after bail-in equivalent to at least 8 per cent of total liabilities. Use of the Resolution Fund is subject to approval by the Commission under the rules on state aid.
8. The MREL is set as a percentage of the institution's total liabilities and can normally be met using the capital and debt instruments stated in the chart, as chosen by the institution. However, the Danish FSA may require that the MREL must consist wholly or partly of liabilities subject to a contractual term for conversion, i.e. contractual bail-in. Moreover, the Danish FSA may require that the MREL must consist wholly or partly of a certain type of eligible liabilities. The need for further regulation of MREL compliance will depend on the resolution plan.
9. Limited to liabilities (i) with a remaining maturity of ≥ 1 year; (ii) not related to derivatives; (iii) issued and fully paid up using funds not financed by the institution itself; (iv) not collateralised or guaranteed; and (v) not related to preferential deposits.

1. The box colours indicate: blue – equity and capital instruments, purple – senior unsecured debt, green – certain deposits, red – joint liability of the sector.

The *asset separation tool* enables the Financial Stability Company to transfer portfolios of assets, rights or liabilities from the failing institution or a bridge institution to an asset management vehicle when this is deemed necessary e.g. to maximise the value of the transferred portfolios in a subsequent sale. This tool is to be combined with one of the other resolution tools.

The Financial Stability Company's use of the resolution tools is supported by a resolution financing arrangement, the Resolution Fund, which must be built up and funded on an ongoing basis by contributions from the institutions. The target level of the Resolution Fund is 1 per cent of all the institutions' covered deposits, currently corresponding to around kr. 7 billion.[12] The main purpose of the Resolution Fund is to guarantee assets and liabilities in the institution under resolution, its subsidiaries or a bridge institution, to grant loans to these, to buy assets from the institution under resolution and to inject capital into a bridge institution. In addition, the Resolution Fund may be used to a limited extent for recapitalisation and loss absorption in the institution under resolution. This is subject to the precondition of prior bail-in corresponding to at least 8 per cent of the institution's total liabilities. The Resolution Fund can then contribute an amount corresponding to up to 5 per cent of the institution's total liabilities.

If the funds in the Resolution Fund are insufficient for a given resolution procedure, the Financial Stability Company may rely on government re-lending for financing the Resolution Fund.[13] The sector overall is liable for such re-lending, which nevertheless entails exposure for the government. It should be noted that this could be a substantial amount in the event of resolution of a SIFI.

Use of the Resolution Fund is subject to approval by the European Commission under the rules on state aid. On the basis of the specific circumstances, the Commission may stipulate terms for state aid approval that restrict the institution's market behaviour, with a view to mitigating distortion of competition.[14]

In a specific resolution situation, the Financial Stability Company must make critical and far-reaching decisions within a very short period. These decisions must be based on a number of fundamental principles, including that losses are borne in accordance with the creditor hierarchy in insolvency, cf. Chart 4.2, and the "no creditor worse off" principle", i.e. no creditor shall incur greater losses than would have been incurred if the institution had been would up under normal insolvency proceedings.[15] Moreover, the board of directors and the board of management are replaced, as a general rule.

In addition to the resolution tools mentioned above, the Financial Stability Company now has many supplementary powers enabling control of the failing institution and the practical implementation of a suitable resolution procedure. These include powers to amend terms of the institution's contracts and temporarily suspend the institution's payment and delivery obligations.

Possible government participation in an extraordinary systemic crisis

The BRRD enables the member states to supplement the resolution tools mentioned above with government financial stabilisation tools. As a result, the government may, under very special circumstances and when certain conditions have been met, participate in the recapitalisation of a failing institution or assume temporary ownership of a failing institution. One of the conditions is that shareholders and creditors have made contributions to loss absorption and recapitalisation of at least 8 per cent of the total liabilities.

12 Cf. quarterly statement as of 30 September 2015 of the Financial Stability Company. The target level is to be built up over 10 years. The individual institutions' contributions are fixed on the basis of their liabilities (except equity and covered deposits) and a risk adjustment. The Resolution Fund is administered by the Financial Stability Company. Its assets and liabilities must be kept separate from the other activities of the Financial Stability Company.

13 It is presupposed that on-lending for loan funding of the Resolution Fund will not be used until after all potential alternative market funding sources have been explored.

14 At present, the development in the Commission's practice for approval of the use of the Resolution Fund for resolution under BRRD is subject to uncertainty.

15 This principle constitutes a key safeguard in relation to the intervention in the property right of shareholders and creditors which the resolution procedure implies. Observance of this principle is assessed in a subsequent independent valuation undertaken as soon as possible after implementation of the resolution measures. If it turns out that a creditor is worse off compared with an insolvency situation, the creditor is entitled to compensation to be paid out of the Resolution Fund.

The government financial stabilisation tools have been implemented into Danish law.[16] However, the members of the banking union will not be able to use these instruments as of 2016 as they are not included in the Regulation on the Single Resolution Mechanism.[17]

Since these are extraordinary instruments, the resolution plans should not assume the application of these instruments. Application of the government financial stabilisation tools should be limited to specific cases where the financial system as such is in a crisis and where non-intervention would have very serious negative implications. On the contrary, resolution planning should ensure that SIFIs too may be resolved without any such systemic effects, cf. below.

PRACTICAL IMPLEMENTATION OF THE FRAMEWORK

After the transposition of the BRRD into Danish law, two – very important – elements have yet to be implemented in order for a credible resolution regime to be in place.[18]

Firstly, a resolution plan must be drawn up for each institution/group, and it must be assessed whether the institution is *resolvable*, i.e. if there are material impediments to resolution of the institution in accordance with the resolution objectives. Secondly – and as part of the resolution planning – each institution/group must meet a requirement for sufficient eligible liabilities for loss absorption and recapitalisation in a resolution situation.[19] In Danmarks Nationalbank's view, these two elements, which are discussed in more detail below, will determine whether the framework will, in practice, function as intended.

Danmarks Nationalbank must be consulted on the resolution planning for SIFIs. This should be viewed as an important aspect of Danmarks Nationalbank's task of contributing to financial stability, which naturally entails a strong focus on the robustness of Danish SIFIs, including that there are sufficient measures in place to ensure that resolution can ultimately be effected without an unacceptable detrimental impact on financial stability and the real economy. In practice, Danmarks Nationalbank cooperates closely with the Danish FSA and the Financial Stability Company in the preparation of resolution plans for the SIFIs, cf. Box 4.2.

Resolution planning is a new concept, which will, especially for SIFIs, involve extensive work with a large element of learning by doing. After the first versions of the plans have been drawn up, they must be updated on an ongoing basis. An ongoing assessment of possible impediments to resolution plays a key role in this connection.

Resolution planning

Overall, resolution planning consists of two integrated elements, i.e. preparation of a resolution plan and an assessment of the institution's resolvability. For groups, resolution planning should, as a general rule, be at group level. For cross-border groups, this generally entails agreement in the relevant resolution colleges.[20] Since formal decision-making responsibility still rests with the individual national authorities, the international cooperation in resolution colleges will play a vital role.

A group resolution plan may either be based on resolution of the group as a whole, where the resolution measures are implemented at Union parent undertaking level, "single point of entry", or presuppose separation and resolution of certain subsidiaries, "multiple point of entry".

The *resolution plan* must determine credible models for the application of the resolution tools and powers of the resolution authorities to ensure that the group in question can be resolved.[21] One

16 In the form of a legal base for the Minister for Business and Growth's use of these instruments in the case at hand, subject to approval and appropriation from the Finance Committee of the Folketing (Danish Parliament) and Commission approval of state aid.

17 See Danmarks Nationalbank, *Financial stability*, 1st Half 2014, Chapter 6, for a more detailed description of the establishment of the banking union, including the Single Resolution Mechanism.

18 However, special legislation for mortgage banks has been adopted, implying a separate description of the framework for resolution of mortgage banks, cf. the last section of this chapter.

19 In the following, reference is made to resolution planning at group level only, as most of the SIFIs are groups.

20 A resolution college is headed by the resolution authority in the member state where the consolidated supervisory authority is situated. Other participants are the resolution authorities in each member state where a subsidiary subject to consolidated supervision is established, or where significant branches are located. In addition, the relevant supervisory authorities, the competent ministries and the EBA are participating.

21 The resolution plan is not an administrative decision which can be appealed by the institution, since the resolution plan solely reflects the authorities' preparation of the resolution of an institution if it becomes failing (the institution receives a summary of the plan). The resolution authority is not bound by the plan in the resolution situation at hand.

The resolution authority in Denmark – division of powers as regards recovery and resolution Box 4.2

In Denmark, the Danish Financial Supervisory Authority and the Financial Stability Company share the role of resolution authority. Overall, the Danish FSA has the powers relating to institutions that are not failing or likely to fail, while the Financial Stability Company is responsible for applying resolution tools in a specific resolution situation. Danmarks Nationalbank must be consulted on resolution planning for SIFIs.

This means that the *Danish FSA* has several new powers concerning recovery and early intervention, cf. the first section of this chapter. Furthermore, the Danish FSA has the decision-making competence in relation to resolution planning, i.e. determination of requirements for eligible liabilities and approval of resolution plans. A close cooperation between the Danish FSA and the Financial Stability Company is presupposed in practice. In connection with the resolution planning, the Danish FSA and the Financial Stability Company must jointly assess whether there are material impediments to resolution of the institution in question in accordance with the resolution objectives. If this is the case, the Danish FSA will ultimately be empowered to require the institution to take various measures to address or remove such impediments.

In a specific situation, where an institution is in a crisis, the Danish FSA assesses whether the first two conditions for resolution exist: (i) that the institution is failing or likely to fail, and (ii) that there are no other measures, including private sector solutions, to prevent the institution from becoming failing within a suitable timeframe. The Financial Stability Company will then assess (iii) whether it is necessary to implement resolution measures to protect the public interest.

If all three conditions are met, the institution is put into resolution under the auspices of the *Financial Stability Company*, which may decide to assume control of the institution, and thus take over the powers vested in the owners and the board of directors, with a view to the most expedient resolution process.

of the principal elements of the resolution plan will be a description of the preferred resolution strategy. The strategy will, inter alia, have to take into account which critical functions are to be continued and thus possibly separated from other functions. Moreover, the plan must state the need for capital and liquidity for carrying out the resolution and describe how this is to be raised. It should be noted that the plan must not presuppose access to extraordinary public financial support, including ELA from Danmarks Nationalbank.

The *assessment of resolvability* entails that it must be feasible and credible to resolve the group in accordance with the resolution objectives. The planned resolution can be deemed feasible when it is assessed that the authorities have the powers necessary to ensure continuation of the critical functions, and that they can be exercised in practice. In order for the planned resolution to be deemed credible, it must be assessed that the application of the resolution tools as such will not generate unacceptable adverse impacts on financial stability and the real economy.[22] This assessment should cover both idiosyncratic shocks, i.e. where only the group in question is affected, and systemic shocks affecting the whole system and the real economy.

If material impediments to resolution are identified, the institution is to implement measures to address or remove these impediments. If required, the Danish FSA is empowered to order this. Such an order may relate to structural changes, limitation of existing business areas, issue of eligible liabilities, changes in the way that eligible liabilities are held within the group, etc.

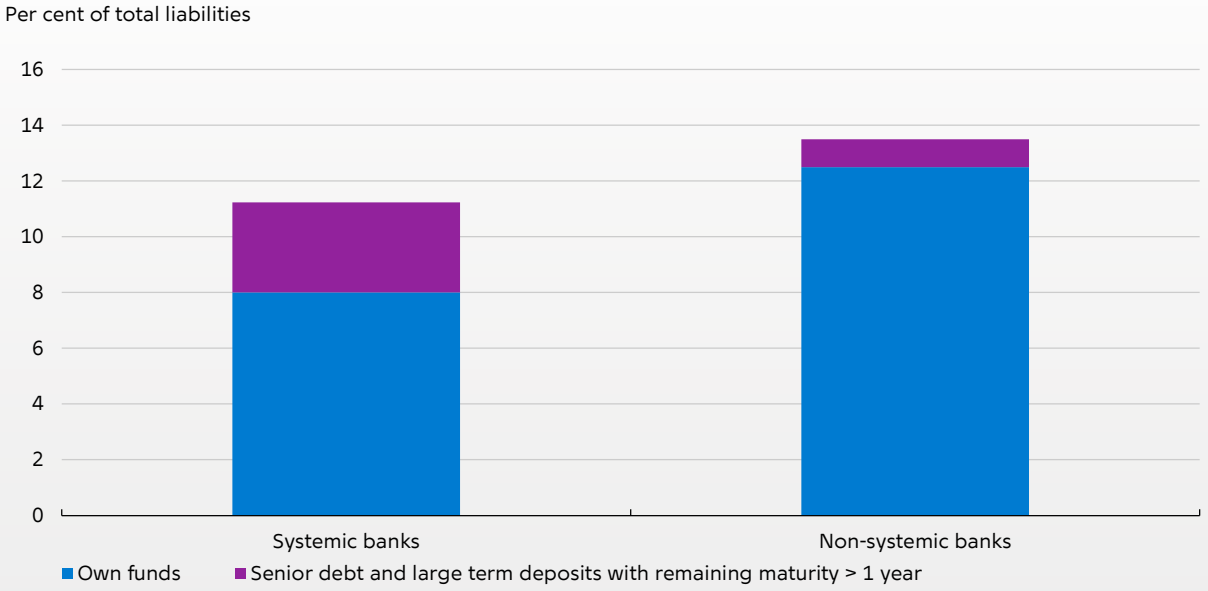
The assessment of the resolvability of the group must be described in the resolution plan, together with measures implemented to address any impediments to resolution. Resolution plans must be updated at least annually and in case of material changes, e.g. in the group's structure, activity areas, financial position or any other changes of significance to the implementation of the resolution plan.

Requirements for eligible liabilities

As a key element of the resolution planning, the Danish FSA in its capacity as resolution

22 Cf. the definition of "resolvability" in Financial Stability Board, *Key Attributes of Effective Resolution Regimes for Financial Institutions*, October 2014 and the EBA's draft for *Regulatory Technical Standards on the content of resolution plans and the assessment of resolvability*, December 2014, EBA/RTS/2014/15.

Liabilities meeting the MREL Chart 4.3



Note: Large term deposits comprise corporate term deposits exceeding kr. 2 million. Data as of 30 June 2015.
Source: Danish Financial Supervisory Authority and own calculations.

authority, after consultation with the Financial Stability Company, is to set a minimum requirement for the individual institutions' own funds and eligible liabilities, i.e. MREL, cf. Box 4.2. The requirement is set as a percentage of the institution's total liabilities and is determined at both individual and consolidated level. The institutions' composition of eligible liabilities shows that the largest institutions are far more likely than other institutions to have senior debt and large term deposits that can be used for MREL purposes, cf. Chart 4.3.

The MREL is to ensure efficient application of the bail-in tool and/or other resolution tools in the resolution situation at hand and reduce the risk of a "bank run" and contagion to the rest of the system. The MREL thus supports the principle that shareholders and subordinated and unsecured creditors (and not the depositors) bear the losses.

The specific MREL must be set based on a number of criteria.[23] First and foremost, MREL must be sufficient to ensure that the institution can be resolved by the application of the resolution tools including the bail-in tool, in a way that meets the resolution objectives. When the bail-in tool is used, the institution must have sufficient eligible liabilities to absorb losses and to restore the capital to a level that enables the institution to continue to meet the requirements for upholding its authorisation. To also ensure that market confidence is maintained to a sufficient degree, the MREL must, as a general rule, be set at a level that allows the institution, after recapitalisation, to meet the capital requirements and capital buffers but also to meet its individual capital need.

When setting the MREL, the extent to which the failure of the institution would have adverse effects on financial stability must be taken into account, including through contagion to other financial corporations. Other criteria include the size, business model, funding model and risk profile of the institution.

23 Cf. BRRD, Article 45(6). These criteria are presupposed to be implemented by an Executive Order on the basis of the Commission's binding technical standard for determining the MREL, which has not yet been adopted, however. (The EBA has prepared a final draft, *Regulatory technical standard on criteria for determining the minimum requirement for own funds and eligible liabilities*, July 2015, EBA/RTS/2015/05).

Loss-absorbing capacity in global systemically important banks

Box 4.3

In November 2015, the Financial Stability Board, FSB, presented final minimum requirements for how large a share of the liabilities in global systemically important banks, G-SIBs, that must be able to absorb a loss in case of resolution. This requirement is called Total Loss Absorbing Capacity, TLAC.[1]

The minimum TLAC requirements will take effect on 1 January 2019 when TLAC must make up at least 16 per cent of risk-weighted assets and 6 per cent of total exposures, rising to 18 per cent and 6.75 per cent, respectively, in 2022. In 2019, the FSB will undertake a review of the implementation of the requirements.

Like the Pillar 1 minimum requirements, the TLAC requirement must always be complied with. Firm-specific additional requirements may be set for individual banks, reflecting the recovery and resolution plan, systemic footprint, business model, risk profile and organisational structure of the individual bank. The capital buffer requirement, which was introduced with Basel III, is added to the TLAC requirement, so that the buffer may actually be loss-absorbing while the bank is still viable.

The TLAC requirement must be met using instruments that can effectively be written down or converted in a resolution and thus absorb losses and be used for recapitalisation of the bank in accordance with the resolution strategy. In general, the instruments must be subordinated to the bank's other liabilities, which addresses the issue mentioned earlier concerning meeting the "no creditor worse off" principle.

The TLAC requirement should be seen as a step by the FSB towards ending the "too-big-to-fail" era for systemically important banks and ensure that in future they can be resolved without the use of public funds. The FSB considers sufficient loss-absorbing capacity to be a precondition for the authorities being able to limit the systemic consequences of the resolution of systemically important banks. Hence, the FSB expects the TLAC requirement to bolster market confidence that systemic banks can be resolved and the implicit government guarantee eliminated.

Nordea is still the only bank in the Nordic countries that has been classified as a G-SIB by the FSB, and hence the only Nordic bank to be directly affected by the TLAC requirement.[2] However, Danish banks should expect a certain impact from market expectations of banks' capitalisation and from future implementation into EU legislation.

By October 2016 at the latest, the EBA must prepare a report on member states' implementation of the BRRD requirement for owns funds and eligible liabilities. On the basis of this report, the Commission should, by end-2016 at the latest, present a proposal, if relevant, for legislation on harmonised application of the minimum requirement.

1. Cf. Financial Stability Board, *Total Loss-absorbing Capacity (TLAC) Term Sheet* and the press release *FSB issues final Total Loss-Absorbing Capacity standard for global systemically important banks*, November 2015.
2. Cf. FSB, *2015 update of list of global systemically important banks (G-SIBs)*, November 2015

The determination of the MREL will depend on the specific resolution plan, which will influence both the level of the MREL and how the requirement must be met within a group. It is important to note that some of the liabilities that can be used for MREL purposes rank pari passu in the insolvency hierarchy with liabilities that must or can be exempted from bail-in in a resolution situation. This may be because they are completely exempt from bail-in or because they may, under the specific circumstances, be exempted from bail-in in order to ensure continuation of critical functions or to prevent contagion, cf. Chart 4.2. The liabilities actually used in a bail-in must thus bear a relatively larger share of the losses. Consequently, it could be difficult to ensure that no creditor incurs greater losses than would have been the case if the institution had been wound up under normal insolvency proceedings (the "no creditor worse off" principle). Hence, it is important to bear the specific institution's composition of liabilities in mind when setting the MREL. The Danish FSA has been empowered to impose requirements that the MREL is to consist wholly or partly of liabilities subject to a contractual term on conversion, *contractual bail-in*, cf. Chart 4.2. This may address the issue of meeting the "no creditor worse off" principle. Moreover, the Danish FSA may impose requirements to the effect that the MREL is to consist wholly or partly of a certain type of eligible liabilities.

The Danish FSA is to check that the individual institution complies with the MREL at all times. In the event of non-compliance, the Danish FSA is to lay down a time limit for compliance. Non-compliance with the requirement can be regarded as a gross violation of the Danish Financial Business Act, which could entail that the institution is regarded as failing or likely to fail.

Mortgage banks are exempt from the MREL, cf. the section below. MREL may thus be set only for banks, investment firms I, financing institutions and financial holding companies.

In November 2015, agreement was reached at the global level on a similar requirement for total loss-absorbing capacity in global systemically important banks, TLAC, cf. Box 4.3.

SPECIAL ISSUES CONCERNING RECOVERY AND RESOLUTION OF MORTGAGE BANKS

The mortgage bond system is a vital part of the Danish financial system, both in terms of home financing and in terms of other financial corporations' use of mortgage bonds as liquidity and wealth management instruments. In this connection, it is important to bear in mind that due to a number of special characteristics of the mortgage bond system a mortgage bank in difficulties may have serious implications for the economy and for financial stability.

Firstly, the mortgage sector is large and highly concentrated. Mortgage loans thus make up around three quarters of all lending by credit institutions to households and the corporate sector, distributed on very few institutions.

Secondly, the mortgage sector is closely interwoven with the rest of the financial system in that mortgage bonds, especially covered bonds, SDOs[24], are used as an important liquidity and wealth management instrument by banks and other financial corporations. So if their value deteriorates, this will entail contagion to the solvency and liquidity of the rest of the financial system. At the same time, most mortgage banks are part of large financial groups, so problems in a mortgage bank cannot be regarded in isolation from the circumstances of the group as such.

Thirdly, all mortgage banks are based on more or less the same business model, meaning that they assume more or less the same risks. If the market loses confidence in issuances by one mortgage bank, confidence in and thus funding for the rest of the sector may rapidly evaporate.

In order to avoid systemic effects, it is thus necessary to ensure that a mortgage bank in difficulties can still lend on market terms, to prevent contagion to the rest of the sector as a result of material deterioration of the institution's SDO issuances, and generally to uphold confidence in mortgage bonds, thereby ensuring continued market access for other mortgage banks. At the same time, it must be ensured that the government is not compelled to take on any significant risk in a resolution situation. The measures in both recovery and resolution plans must be realistic in the event of both an idiosyncratic shock and a systemic shock with even more limited possibilities of divesting parts of the institution and even more restricted access to new capital.

Recovery

The mortgage banks' business model relies on broad demand for their bonds and prices on a par with competitor prices. The recovery plan is to ensure that these conditions continue to apply if the institution encounters difficulties. The plan must thus comprise measures to address both solvency- and liquidity-related difficulties. A situation where losses reach a magnitude that threatens the institution's solvency is obviously critical. But such a situation typically occurs later in the crisis process. The recovery plan also needs to take into account what happens already at the point where the institution's difficulties lead to market doubts about its soundness.

A mortgage bank must include efficient measures in its recovery plan to address three vulnerabilities in particular:

SDO status of bonds: In order to maintain the SDO status of its bonds, the institution must pledge top-up collateral when the value of the assets covering the bonds in the relevant capital centre no longer corresponds to the value of the bonds or no longer meets the LTV limits for the individual loans that applied when the loans were granted. This may be the case in the event of plummeting property prices. If there is financial market turmoil at the same time, the institution may find it difficult to pledge top-up collateral.[25]

Credit rating of the institution: The price of – and access to – funding depends on the credit ratings of the institution and the bonds. A considerable downgrading will thus restrict the institution's access to funding.

Maturity extension of bonds issued: The Danish Refinancing Act entails mandatory contingent maturity extension for mortgage bonds with shorter maturities than the underlying loans. The

24 In the following, SDO is used as a generic term for covered bonds, SDOs, and covered mortgage bonds, SDROs.

25 It follows from the Danish Mortgage-Credit Loans and Mortgage-Credit Bonds, etc. Act that bonds which lose their SDO status can be referred to as mortgage bonds (ROs), if they meet the statutory RO requirements at the time of the loan offer. This will affect other institutions holding such bonds and using them as liquid instruments, as they will have to increase their capitalisation to cover the higher risks.

extension by one year takes effect if a refinancing auction fails, or if the yield on mortgage bonds with an original maturity of up to and including two years rises by more than 5 percentage points within one year. The rate of interest on the extended bonds is fixed with a premium of 5 percentage points on the rate of interest on corresponding bonds at the latest refinancing or, depending on the bond type, one year previously or at the time of the latest interest rate fixing.[26] The higher interest rate is passed on to borrowers, making it more difficult for them to honour their obligations.

All three vulnerabilities may lead to breach of confidence between the institution and the market, which would affect the opportunities to issue new bonds for a period of time. In the event of investor uncertainty about an institution, where investors demand a higher risk premium on its bonds, yields will be higher for the customers, who will – where possible – turn to a competitor to raise a corresponding, but cheaper loan. This could start a negative spiral, which may take effect quickly, whereby a share of the institution's most creditworthy customers redeem their loans, which reduces the average credit quality of the institution's loans. This leads to further deterioration of the institution's market access, and bond prices, which again prompts more of the most creditworthy customers to switch to other institutions, etc. If the institution loses its access to financing on market terms, it should thus be regarded as doubtful whether its business model is viable.

Resolution

If the institution is not able to implement efficient recovery measures in a timely manner, it will, when likely to fail, be put into resolution. On the basis of objective factors, the Danish FSA assesses when the institution is found to be likely to fail.

Similarly to SIFI banks, where resolution entails a risk of systemic consequences, it is vital that a credible resolution plan exists, which enables the Financial Stability Company to restructure a failing mortgage bank in accordance with the resolution objectives. In Danmarks Nationalbank's opinion, this implies that it should be possible to continue operation of the institution (its ability to grant new loans), and that the value of the SDOs should be maintained. Thus, the institution should relatively quickly be able to operate on market terms again, including have the ability to refinance issued bonds, the SDO status of which must be maintained/regained.

Solvency problems in a mortgage bank may either be attributable to insolvency of one (or more) of the institution's capital centres, with the institution being unable to recapitalise it, or to insolvency of the institution as a whole (the legal entity).

A mortgage bank may encounter liquidity problems either if a refinancing auction fails, or if the institution is unable to maintain the SDO status – and sufficient credit rating – of its bonds (from one or more capital centres), cf. also the section on the recovery phase above. However, in principle the maturity extension ensures the institution's financing ability in a situation where it is unable to refinance expired bonds, so that, to all intents and purposes, it will not lose its existing financing. But the maturity extension may have considerable implications for the institution's business model, as mentioned.[27]

The bail-in tool cannot be applied to resolution of a mortgage bank. The reason is that no MREL applies to mortgage banks, as mentioned above. Instead of an MREL there is a requirement for mortgage banks to hold a "debt buffer" of 2 per cent of their total unweighted lending.[28] The debt buffer can be met by means of Common Equity Tier 1 capital, Additional Tier 1 capital,

26 Cf. Act No. 244 of 19 March 2014 to Amend the Act on Mortgage-Credit Loans and Mortgage-Credit Bonds, etc. and the Financial Business Act (Regulation of the refinancing risk inherent in mortgage-credit bonds, covered mortgage-credit bonds and covered bonds, etc.). The mechanisms of this Act and their effects are described in more detail in Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2014, p. 37 ff.

27 The Refinancing Act makes it clear what will happen if a refinancing procedure cannot be carried out on market terms. However, the Act does not fundamentally address the challenge of short-term financing of a substantial part of the mortgage banks' long-term liabilities.

28 The debt buffer requirement is to be phased in until 2020. It appears from the explanatory notes to the Act that the requirement is to be evaluated by 2018, including in the light of the MREL for Danish SIFI banks and developments in the market for debt instruments in Europe. In this connection, it is stated that it cannot be ruled out that there may be a need to increase the debt buffer requirement and that the evaluation period provides for the possible adoption of such an increase before the requirement is fully phased in by 2020.

Tier 2 capital and/or senior unsecured debt, to be issued by the "mortgage bank as such" with an original maturity of at least 2 years. The debt buffer supports the option of resolving a mortgage bank using the bridge institution tool, since the capital- and debt-instruments in question can absorb losses when left in the insolvent estate of the failing institution (which is not bail-in in the statutory sense).

The special legislation for mortgage banks presupposes that resolution of a mortgage bank is possible using the other three BRRD tools – bridge institution, asset separation or sale of business – and/or using the winding-up model of the Danish Mortgage Credit Act. However, in the assessment of Danmarks Nationalbank, using the winding-up model of the Danish Mortgage Credit Act for resolution of a mortgage bank as a whole or in part would not meet the resolution objectives, cf. Box 4.4.

It may be possible to use the *sale of business tool* to sell off solvent capital centres, which would, to some extent, imply continuation of the institution's activities in another legal entity. However, this may present considerable challenges in terms of making sure that the claims of mortgage bond holders in other capital centres will be honoured. Moreover, it is doubtful whether finding a purchaser will be likely, considering competition law aspects, the special business model and the access/desire to raise capital for the purchase under the circumstances at hand, especially in a systemic scenario.

The *bridge institution tool* may be used only to the extent that it is possible to balance the institution's assets and liabilities.[29] In this connection it should be assumed that any Junior Covered Bonds, JCBs, in the capital centres to be transferred to the bridge institution cannot be left in the insolvent estate as loss-absorbing instruments, since the JCB holders are entitled to retain their secondary preferential rights in relation to the assets of the capital centre from which they are issued.

The bridge institution is to be capitalised to obtain licence to operate as a mortgage bank – and get SDO status – with a view to continued new lending and to selling the institution as soon as possible. It should be assumed that part of the capital and liquidity need of the bridge institution must be covered by loans and capital injections from the Resolution Fund. If this means that the bridge institution becomes subject to conditions restricting the institution's ability to lend on general market terms, it will be difficult to maintain the institution's lending capacity. It should be noted that capital injections from the Resolution Fund to a bridge institution are not subject to the condition mentioned above concerning prior bail-in equivalent to 8 per cent of the institution's liabilities.

However, the Resolution Fund cannot be used for absorbing losses in and recapitalising the failing institution, because bail-in is not an option in connection with mortgage banks, and hence the condition about 8 per cent bail-in cannot be met.

In Danmarks Nationalbank's opinion, it is essential to address the above-mentioned challenges regarding the resolution of mortgage banks – and their interaction – in connection with the outstanding work with resolution planning. Thus, it must be possible to resolve all SIFIs, including mortgage banks, in accordance with the resolution objectives. This entails that it must be possible to resolve a failing mortgage bank in a way that retains the lending capacity of the institution and prevents contagion to the rest of the financial system. There is an important work to be done to find out how to ensure this in practice, so that robust and credible resolution plans can be drawn up.

29 If the tool is used for part of the institution only, the remainder must be resolved in a winding-up procedure, cf. Box 4.4.

The special winding-up model for mortgage banks

Box 4.4

Winding-up proceedings for mortgage banks are subject to special rules on administration of capital centres in order to ensure a high degree of protection against losses for the bond holders. The special winding-up model for mortgage banks has not been applied in practice.

There is no acceleration, either on the bond side or on the loan side, when a mortgage bank goes into winding-up proceedings. Consequently, bond holders may not claim early redemption of their bonds, nor may the administrator claim early redemption from borrowers. In order to protect bond holders' primary preferential rights to the collateral in the capital centres, it is not possible to transfer funds between the individual capital centres after the mortgage bank has failed. However, subject to permission from the Minister for Business and Growth, the administrator may transfer capital centres to third parties.

The mortgage bank may conclude contracts on financial instruments, raise loans and pledge collateral for loans, if required to raise liquidity. If there is a need for ongoing refinancing of existing mortgage loans, the administrator may issue "refinancing bonds" on condition that there is deemed to be full dividend for all mortgage bond holders and derivative counterparties in the capital centre in question (irrespective of the maturities of the bonds). Under the Refinancing Act, the maturities of existing bonds may be extended by 1 year at a time if refinancing fails, or if the administrator finds it impossible to issue refinancing bonds due to the consideration of equal treatment of creditors. The interest rate on the extended bonds is fixed by the administrator as a variable reference rate plus a premium of up to 5 percentage points. Maturity extension by 1 year at a time may continue for the remaining maturity of the loan.

The special winding-up model for mortgage banks thus lays down a clear framework for how a mortgage bank can be resolved without the use of public funds. As a general rule, winding-up proceedings of a mortgage bank should thus entail less uncertainty about creditor claims than would have been the case for winding-up proceedings of a bank.

Needless to say, the final calculation of the value of the capital centres and the total estate may imply that the claims of the creditors, including the mortgage bond holders, are not (fully) redeemed. In addition, a number of issues in relation to winding-up proceedings – of separated capital centres or the institution as a whole – entail considerable negative consequences for the economy and financial stability:

- During the winding-up proceedings, the mortgage bank loses its licence to operate as a mortgage bank, so it will be unable to issue new loans, including effecting outstanding loan offers. New loans will thus have to be granted by other institutions, which will cause capacity pressure – in view of the institutions' market shares.
- The bonds issued will lose their SDO status, unless the administrator injects the necessary top-up collateral to the relevant capital centres, which may be very difficult. Similarly, the credit ratings of the institution and its bonds should be expected to deteriorate. Consequently, the institution's (financial) creditors will need to hold more capital to cover the risks associated with the bonds, and it may mean that they cannot be used for liquidity management purposes to the same extent.
- Borrowers' access to redeem loans should be expected to entail that the most secure loans vanish from the balance sheet. This could give rise to a negative spiral between the market value of the institution's bonds and the average credit quality. The market value of the institution's bonds can thus be affected quickly, which will reinforce the negative pass-through to the institution's creditors, including the rest of the sector.
- Given the insolvent institution's limited access to issue refinancing bonds, it must be assumed that the maturities of the bonds issued will be extended – with the resulting consequences for borrowers, investors and the real economy. It will be even more difficult for the borrowers to honour their obligations, implying further deterioration of the credit quality for the investors.
- At the same time, there will be a particular effect on bonds with shorter remaining maturities (and JCBs), because the total value of the capital centre in question is not known until after the expiry of the bonds with the longest maturities. Holders of bonds with shorter maturities (and JCBs) thus run the risk of a temporary haircut until the final value of the capital centre is known, which may take 30 years.

The application of the special winding-up model may thus as such have considerable consequences for solvency and liquidity in the rest of the financial system, general confidence in mortgage bonds and hence the remaining mortgage banks' access to funding and thus the access to credit. Against this backdrop, Danmarks Nationalbank finds that resolution using the special winding-up model does not meet the resolution objectives for mortgage banks.

APPENDIX

APPENDIX 1

For banks, the analyses are based on the institutions included in the Danish Financial Supervisory Authority's groups 1 and 2 in 2015.

The analyses of mortgage credit include all mortgage banks, cf. Table B1.1.

The five banks in the Danish Financial Supervisory Authority's group 1 are called systemic banks or large banks in the report.

Unlike the Danish Financial Supervisory Authority's group 2, Saxo Bank and FIH Erhvervsbank have been omitted from the population. Saxo Bank has been omitted due to its business model and FIH Erhvervsbank has been omitted as it is in winding-up proceedings. The remaining banks in groups 2 are called non-systemic banks or medium-sized banks in the report.

The grouping also applies back in time.

Banks and mortgage banks in the population by total assets as at 30 June 2015, kr. million Table B1.1

	Amount		Amount
Systemic groups		Ringkjøbing Landbobank	22,118
Danske Bank (including Realkredit Danmark)	3,452,213	Vestjysk Bank	22,103
Nordea Bank Danmark (including Nordea Kredit)	807,226	Sparekassen Kronjylland	18,744
Jyske Bank (including BRFkredit)	541,031	Den Jyske Sparekasse	15,705
Nykredit Realkredit (including Nykredit Bank)	1,407,960	Lån & Spar Bank	15,475
Sydbank	153,059	Jutlander Bank	15,120
DLR Kredit	144,182	Sparekassen Sjælland	14,279
Systemic groups, total	**6,505,671**	Sparekassen Vendsyssel	13,656
		Alm. Brand Bank	11,573
Systemic banks		**Non-systemic bank, total**	**271,325**
Danske Bank	2,202,091		
Nordea Bank Danmark	506,613	*Mortgage banks*	
Jyske Bank	310,863	Nykredit Realkredit	1,302,729
Nykredit Bank	192,225	Realkredit Danmark	858,010
Sydbank	155,209	Totalkredit	664,045
Systemic banks, total	**3,367,002**	Nordea Kredit	440,552
		BRFkredit	267,960
Non-systemic banks		DLR Kredit	144,182
Spar Nord Bank	80,666	LR Realkredit	20,089
Arbejdernes Landsbank	41,885	**Mortgage banks, total**	**3,697,567**

Continues next column

Note: Total assets for systemic banks, non-systemic banks and mortgage banks are stated at solo level. Total assets for systemic groups are at a group level.
Source: Annual reports.

APPENDIX 2

Macroeconomic scenarios of Danmarks Nationalbank's stress test, selected key variables Table B2.1

	2015	2016	2017
Baseline scenario			
GDP, per cent, year-on-year	1.8	2.1	1.8
Private consumption, per cent, year-on-year	1.8	2.2	2.1
Export market growth, per cent, year-on-year	4.3	5.4	4.7
Unemployment rate, per cent	3.5	3.2	3.1
House prices, per cent, year-on-year	6.0	3.7	3.2
Low growth			
GDP, per cent, year-on-year	1.8	-0.6	0.9
Private consumption, per cent, year-on-year	1.8	-2.4	-0.5
Export market growth, per cent, year-on-year	4.3	5.4	4.7
Unemployment rate, per cent	3.5	3.9	4.6
House prices, per cent, year-on-year	6.0	-1.6	-2.4
Severe recession			
GDP, per cent, year-on-year	1.8	-4.4	-0.9
Private consumption, per cent, year-on-year	1.8	-3.8	-1.4
Export market growth, per cent, year-on-year	4.3	-10.0	3.7
Unemployment rate, per cent	3.5	5.1	7.9
House prices, per cent, year-on-year	6.0	-12.4	-6.6

Note: Annual averages. Unemployment is expressed as a ratio of the labour force.