

DANMARKS  
NATIONALBANK

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**FINANCIAL STABILITY**  
**1<sup>ST</sup> HALF**

**2015**



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# 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

## ASSESSMENT AND RECOMMENDATIONS

### ASSESSMENT<sup>1</sup>

Most credit institutions have put the financial crisis behind them. Loan impairment charges are decreasing, capitalisation has increased and in general the excess liquidity cover is high.

In recent years, bank earnings have been under pressure due to low demand for new loans and low interest rates. Negative interest rates could add to this pressure if the banks are unable to reduce their funding costs in step with the falling interest rates on assets.

In the first months of 2015, deposit rates fell considerably, and negative deposit rates became more common. The banks' income from fees has been rising in recent years and has made up for the decline in net interest income. Hence, the banks are adapting to a situation with negative interest rates. When interest rates fall, banks can also be assumed to adjust their return on equity, ROE, targets downwards.

The fall in interest rates in early 2015 also led to rising earnings for credit institutions in the form of e.g. more remortgaging and income from sale of forward exchange contracts to domestic and foreign investors.

Total lending to households and the corporate sector has been virtually unchanged since the financial crisis, but the aggregate figure masks a downward trend in lending by banks and an upward trend in lending by mortgage banks. In

previous upswings demand for loans has typically not risen until some time after the upswing set in. So it cannot be taken for granted that demand for new loans will rise notably in the near term. Danmarks Nationalbank's lending survey pointed to small increases in demand for loans from retail customers and new corporate customers over the last year. The survey also indicates that banks and mortgage banks expect demand to have risen slightly in the 2nd quarter of 2015.

While lending by credit institutions has remained unchanged since the financial crisis, bank deposits have risen. This reflects that both retail and corporate customers have increased their aggregate deposits since 2011 rather than reducing their debt to the credit institutions. Over the last decades, the interest margin, i.e. the difference between the banks' average lending and deposit rates, has narrowed considerably. As regards mortgage loans, the rate of interest on short-term adjustable rate loans has also fallen to a very low level. Overall it has become less costly to have deposits and loans at the same time.

Taken as one, the Danish banks have a customer funding surplus, and they all have considerably higher excess liquidity cover than required at present. In October 2015 the European Liquidity Coverage Ratio, LCR, requirement will enter into force. Systemic groups must observe an LCR of

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1 An overview of the structure of the Danish bank and mortgage bank sector and the delineation of the report's population can be found in Appendix 1.

100 per cent from October 2015. In Danmarks Nationalbank's assessment, those who do not already meet the minimum LCR requirement will be able to make the necessary adjustments by the implementation date.

The combination of a level of capitalisation that for many institutions exceeds the current capital requirements considerably, high excess liquidity cover, very low interest rates and limited demand for new loans creates a basis for fiercer competition for customers. In March 2015, the Danish Financial Supervisory Authority published an investigation of new corporate loans granted by selected banks and found indications of increased competition for corporate customers. The increased competition is reflected in lower lending rates for the best customers and to a lesser extent in easing of other terms and conditions such as collateral requirements. Danmarks Nationalbank's lending survey also points to a slight tendency for the banks to reduce interest rates on loans to corporate customers in response to competitor behaviour.

Competition may intensify further in the near future, and it is important that the banks do not lower their credit standards. If there are banks that do not have a viable business model in the current competitive situation, they should seek a market-based solution by e.g. merging or being acquired.

The six systemic groups all have substantial excess capital adequacy relative to the current requirements. Capital requirements will increase in the coming years as the new CRDIV/CRR capital adequacy rules are phased-in. Most of the groups already meet the capital requirements as fully phased-in, but some have only limited excess capital adequacy.

Besides the CRDIV/CRR capital requirements, ongoing international discussions regarding amendment of the capital adequacy rules could affect the calculation of and requirements for the capitalisation of banks in the future. In addition, a number of comparable countries outside the banking union have chosen to introduce higher capital requirements than the fully phased-in requirements in Denmark. Hence it is important that the systemic groups prepare for a situation with higher capital requirements as the new market standard.

Danmarks Nationalbank performs semi-annual stress tests of the banks' capitalisation in vari-

ous macroeconomic scenarios. The results of the stress test show that the systemic banks, which have a market share of 85 per cent of total bank lending and guarantees, are robust. The five systemic banks have considerable excess capital adequacy in relation to the minimum requirements in 2017 in all stress test scenarios.

Danmarks Nationalbank's stress test shows the banks' excess capital adequacy in relation to not only the minimum requirements, but also the capital buffer requirements, in the stress test defined as the capital conservation buffer and the SIFI capital buffer. The capital buffer requirements can help to ensure that banks observe the minimum requirements, also in downturn periods. In the most severe stress test scenario, in 2017 some systemic banks will have a small capital shortfall, in relation to the capital buffer requirements, of about kr. 1 billion, or 0.1 per cent of the total risk-weighted exposures of the stress test population. The capital buffer requirements were introduced to enable the banks' capital buffers to absorb losses in the event of severe economic shocks. Given that the capital shortfall of the systemic banks arises in the most severe scenario and since there is still considerable excess capital adequacy in relation to the minimum requirements, Danmarks Nationalbank assesses that the capital shortfall of the systemic banks in relation to the capital buffer requirements in the most severe scenario will not pose a threat to financial stability. It is to be expected that the banks which only just comply with the fully phased-in buffer requirements will gradually increase their capitalisation over the coming years to provide some scope for meeting the buffer requirements.

The Danish Financial Supervisory Authority has introduced a Supervisory Diamond for mortgage banks, comprising five indicators. One of the indicators relates to deferred amortisation on loans to home owners and must be met from 2020. The Supervisory Diamond's indicator does not relate to the mortgage bank's individual loans, but to its overall portfolio. The Supervisory Diamond is a good supervisory tool that will contribute to reducing risks within the mortgage credit system. However, in Danmarks Nationalbank's assessment, offering borrowers deferred amortisation at high loan-to-value, LTV, ratios still involves too high risks for the mortgage banks.

The current market conditions with historically low interest rates could entail financial stability risks. By taking excessive risk in their market exposures and not ensuring sufficient risk management, financial actors may become vulnerable to a reversal of the international search for yield. A price adjustment for financial assets can be rapid; for example, yields on long-term bonds have risen suddenly and sharply from mid-April 2015. These risks may result in direct losses due to exposures in financial assets, but there could also be derived effects from the potential market turmoil triggered by such market adjustment, e.g. because market access becomes more difficult.

The markets expect interest rates in Europe and Denmark to remain low in the coming years. The combination of an upswing in the Danish economy and extraordinarily low interest rates means that the conditions for a build-up of systemic risks exist. It could be brought on by e.g. excessive risk appetite among credit institutions and borrowers. The extraordinarily low interest rates could speed up this development and lead to faster build-up of systemic risk.

## RECOMMENDATIONS

On the basis of Danmarks Nationalbank's analyses, the assessment is that the following recommendations will contribute to strengthening financial stability in Denmark.

### **THE BANKS SHOULD ENSURE THAT THEY HAVE SOUND EARNINGS AS PROTECTION AGAINST LOSSES**

The combination of the banks' high excess liquidity cover, very low interest rates and limited demand for new loans creates a basis for fiercer competition for customers. It is important that the banks do not lower their credit standards. If there are banks that do not have a viable business model in the current competitive situation, they should seek a market-based solution by e.g. merging or being acquired.

### **THE BANKS SHOULD MAINTAIN A HIGH DEGREE OF CAPITALISATION RELATIVE TO THE FULLY PHASED-IN CAPITAL REQUIREMENTS**

The banks generally comply with the new, stricter capital requirements, but some have only little ex-

cess capital adequacy relative to the fully phased-in requirements in 2019. Amendments to the capital adequacy rules are being discussed at the international level. This may have an impact on the regulatory calculation of and requirements of the banks' capitalisation in future, but also on the market's capitalisation requirements. Therefore it is important for the banks to prepare for higher capital requirements, whether they are driven by regulatory amendments or new market standards.

### **THE CREDIT INSTITUTIONS SHOULD TAKE INTO ACCOUNT THE RISKS THAT MAY ARISE IF THE INTERNATIONAL SEARCH FOR YIELD REVERSES**

Credit institutions should ensure that they are able to withstand both direct losses due to price adjustments for financial assets and the derived effects of the potential market turmoil triggered by such adjustment – e.g. because market access becomes more difficult.

### **THE MAXIMUM LTV RATIO FOR DEFERRED AMORTISATION LOANS SHOULD BE REDUCED IN ORDER TO PROTECT THE MORTGAGE CREDIT SYSTEM**

It is essential to design the mortgage credit system in such a way that bonds remain secure and the system is still robust in periods when house prices fall. Reducing the maximum LTV ratio for deferred amortisation loans ensures that all borrowers build up a certain distance to the LTV limit automatically over time. That will further support the mortgage credit system's high degree of security, even if house prices are plummeting. Reduction of the maximum LTV ratio should apply to deferred amortisation loans underlying covered bonds, covered mortgage bonds and mortgage bonds issued by banks and mortgage banks.

### **DENMARK SHOULD PARTICIPATE IN THE BANKING UNION**

Overall, Danish participation is expected to make a positive contribution to financial stability in Denmark. Danish participation would entail stronger supervision of the largest Danish credit institutions compared with today. At the same time, Denmark would participate in the banking union's Resolution Mechanism, where a central authority, the Single Resolution Board, guarantees credible and consistent application of the rules saying that creditors bear the losses of distressed banks. Common standards and practices across national

borders would also provide a basis for enhanced competition in the market for financial services in Denmark – to the benefit of households and firms. If Denmark opts out of the banking union, this decision should be followed up by a renewed assessment of whether to increase capital requirements for the largest credit institutions.

## OVERVIEW OF DANMARKS NATIONALBANK'S RECOMMENDATIONS

Danmarks Nationalbank publishes a number of recommendations with a view to strengthening financial stability in Denmark. At present the list includes seven recommendations, cf. Table 1.1.

The new Liquidity Coverage Ratio, LCR, requirement enters into force on 1 October 2015. In Danmarks Nationalbank's assessment, the non-systemic banks that do not yet meet the LCR requirement of 60 per cent will be able to make the necessary adjustments by October 2015. Consequently, the previous recommendation that the non-systemic banks should prepare for the phasing-in of new liquidity regulation have been met.

### Overview of Danmarks Nationalbank's current recommendations Table 1.1

- The banks should ensure that they have sound earnings as protection against losses.
- The banks should maintain a high degree of capitalisation relative to the fully phased-in capital requirements in 2019.
- The credit institutions should take into account the risks that may arise if the international search for yield reverses.
- The maximum loan-to-value ratio for deferred amortisation housing loans should be reduced in order to protect the mortgage credit system.
- Denmark should participate in the banking union.
- Housing taxes should be changed so that they automatically reflect property and land values.
- The level of disclosure should be high in connection with encumbrance of bank assets, including contingent encumbrance.

# 2

## DEVELOPMENT AND TRENDS

### MACROECONOMIC AND FINANCIAL BACKGROUND

#### ACTIVITY ON THE INCREASE

Growth in the advanced economies is modest, but gradually increasing, while growth is decreasing in the emerging market economies. Growth in the euro area has increased since mid-2013 and has been almost constant in the USA in the same period, cf. Chart 2.1.

Global economic activity is supported by the drop in oil prices by around 45 per cent since June 2014. Moreover, interest rates are very low in the advanced economies, and the currencies

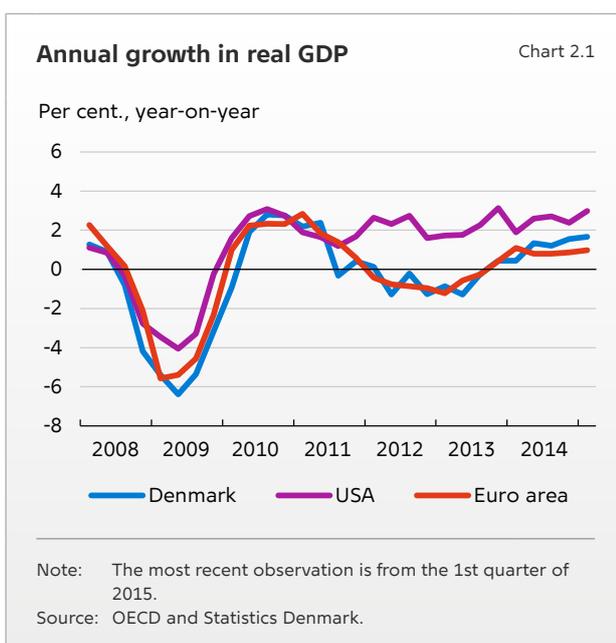
of the euro area and Japan, among others, have weakened. This sets the stage for continued growth in 2015. The international organisations have adjusted their forecasts upwards for GDP development in the euro area in 2015 and 2016. Their projections point out that the development may be more favourable than expected, e.g. due to positive effects of low oil prices. In the euro area, the falling interest rates and the weakening of the euro may also lead to higher than expected growth. On the other hand, the conflict between Ukraine and Russia may have a downside effect on growth in Europe. Greece has seen heightened political and economic uncertainty over the last six months, but so far contagion effects on other euro area member states have been limited.

Denmark is experiencing an economic upswing. Danmarks Nationalbank expects annual economic growth of around 2 per cent this year and the next few years. This will close the output gap in the coming years.

House prices are rising in general, but with substantial regional variation. Especially prices of owner-occupied flats in Copenhagen have risen, and the nominal prices are now almost comparable to the level at the peak of the housing bubble at end-2006. House prices are increasing only slowly in other parts of Denmark.

#### EXTRAORDINARILY LOW INTEREST RATES

On 22 January 2015, the European Central Bank, ECB, announced an expansion of its existing programme for bond purchases in the secondary market. As from March, the ECB's bond purchases have totalled around 60 billion euro per month,



and the ECB expects to continue with this purchase programme until September 2016.

The ECB's expansion of its asset purchase programme led to negative interest rates on a number of government securities in the euro area. At the end of March 2015, approximately 30 per cent of all government debt in the euro area was subject to negative market rates.<sup>1</sup> At the same time, stock prices rose substantially. The broad stock index for the euro area, STOXX, increased by 10 per cent from 22 January 2015 to end-May 2015. This implies that recent years' tendency towards price increases for financial assets and a global search for yield has continued into 2015. Credit institutions should ensure that they are able to withstand both direct losses due to price adjustments for financial assets and the derived effects of the potential market turmoil triggered by a sudden reversal of the international search for yield.

The financial markets began to expect an expansion of the ECB's asset purchase programme especially from August 2014. This was one of the reasons for the considerable inflow of capital into Switzerland in late 2014 and early 2015, entailing upward pressure on the Swiss franc. On 15 January, Schweizerische Nationalbank, SNB, abandoned the minimum exchange rate of 1.20 Swiss francs per euro and lowered the monetary policy interest rate to -0,75 per cent.

The SNB's and the ECB's announcements led to stronger demand for Danish kroner and a tendency for the krone to strengthen against the euro. In order to stabilise the exchange rate of the krone, Danmarks Nationalbank intervened in the market, buying foreign exchange exchange against kroner for a considerable amount. Interventions in January and February 2015 totalled kr. 275 billion. Danmarks Nationalbank reduced its monetary policy interest rates on four occasions in January and February. The rate of interest on certificates of deposit was reduced to -0.75 per cent, an all-time low.

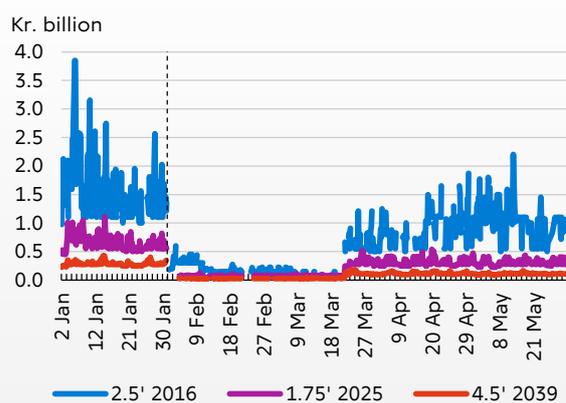
Yields on European government bonds, including Danish government bonds, rose markedly from mid-April. The rise in yields was most pronounced for government bonds with longer maturities. Nevertheless, yields are still considerably below the 2014 average. Since the end of February, the capital inflow has reversed to an

outflow, and Danmarks Nationalbank sold foreign exchange in the market for a total amount of kr. 69 billion in April and May.

As a measure limiting the capital inflow at the beginning of the year, the Ministry of Finance, at the recommendation of Danmarks Nationalbank, decided to suspend, until further notice, issuance of Danish government bonds with effect from 30 January 2015. The measure had the intended effect, since it led to narrowing of the government bond yield spreads between Denmark and the euro area.

The suspension of issuance has influenced liquidity in the Danish government bond market. This is reflected, inter alia, in price quoting of Danish government bonds at higher bid-ask spreads than normal. The market depth, i.e. the volumes that can be traded at the quoted prices, has also been reduced, cf. Chart 2.2. Against that background, Danmarks Nationalbank has implemented measures to support market liquidity in the current situation without issuance. In mid-May 2015 the central government resumed switch operations of Danish government bonds. Switches give market participants the opportunity to exchange existing securities into new on-the-run securities, which may contribute to facilitating

**Depth of the market for Danish government bonds, 2015** Chart 2.2



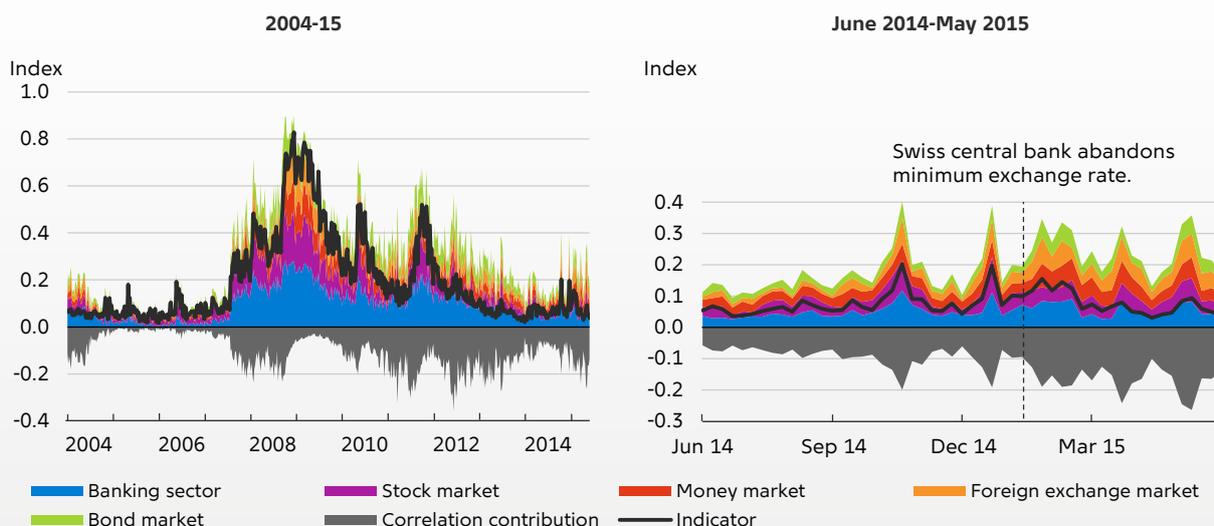
Note: The depth for a given bond shows the total volume of sales orders on the MTS Denmark trading platform. 2.5'2016: 2.5 per cent bullet loan 2016, 1.75'2025: 1.75 per cent bullet loan 2025, 4.5'2039: 4.5 per cent bullet loan 2039. The most recent observation is from 1 June 2015.

Source: Bloomberg.

<sup>1</sup> See IMF, *Global Financial Stability Report*, April 2015.

Financial stress indicator for Denmark

Chart 2.3



Note: Danmarks Nationalbank's financial stress indicator has been constructed in such a way that low correlation between the markets gives a deduction and thus a lower stress level in the indicator. The components and calculations of the indicator are described in Appendix 2 in Danmarks Nationalbank, *Financial stability*, 2nd Half 2014. The most recent observation is from 31 May 2015.

Source: Danmarks Nationalbank.

government bond trading. Temporarily lower liquidity in the Danish government bond market is not found to be a problem in relation to Danish banks' liquidity management.

The need of the monetary counterparties to place funds at Danmarks Nationalbank has increased considerably due to Danmarks Nationalbank's purchases of foreign exchange in the market and the suspension of issuance of government bonds. Against that backdrop, in March 2015, Danmarks Nationalbank increased the overall current account limit from kr. 37 billion to kr. 173 billion. The need of monetary policy counterparties to place funds in certificates of deposit is sufficient to ensure that the rate of interest on certificates of deposit is transmitted to market interest rates.

The general fall in interest rates was also reflected in mortgage bond yields, which in the beginning of 2015 became negative for short maturities. The increased occurrence of negative interest rates raised a number of technical and legal questions, particularly in relation to taxation and issuance of mortgage bonds with negative yields. Most of these issues have been clarified by now, and the impact of negative interest rates on mortgage banks is assessed to be limited, cf. Chapter 4.

The markets expect interest rates in Denmark and the rest of Europe to remain low in the coming years. The combination of an upswing in the Danish economy and extraordinarily low interest rates means that the conditions for a build-up of systemic risks in Denmark exist. It could be brought on by e.g. excessive risk appetite among credit institutions and borrowers. The extraordinarily low interest rates could speed up this development and lead to faster build-up of systemic risk.

#### THE LEVEL OF FINANCIAL STRESS REMAINS LOW

Assessed on the basis of a number of indicators, the stress level in the financial markets has been moderate in recent months, cf. Chart 2.3, left. Danmarks Nationalbank's financial stress indicator shows an increase in volatility in the money, foreign exchange and bond markets around the turn of the year and in the following months, cf. Chart 2.3 (right). The absence of transmission to the stock market indicates that the pressure on the krone did not entail any widespread stress in the financial system. At the end of May 2015, the stress level was as low as before the financial crisis.

Danmarks Nationalbank's financial stress indicator measures the current stress level and cannot be used for measuring build-up of systemic risk.

This appears from e.g. the situation before the financial crisis, which was characterised by a low measured stress level, while systemic risks were building up in Denmark and globally.

The development in Denmark in 2014 and 2015 was parallel to developments in the euro area.<sup>2</sup>

## **DENMARK SHOULD PARTICIPATE IN THE BANKING UNION**

The government's report on possible Danish participation in the Banking Union was published in April 2015. The report concludes that, in an overall perspective, there are many arguments for participation in the banking union being in Denmark's best interest, but a final decision should await further clarification of, inter alia, treatment of the Danish mortgage credit system as well as macro-prudential decisions.

Danmarks Nationalbank finds that Denmark should participate in the banking union, and that early Danish participation would benefit Danish interests. Danmarks Nationalbank assesses that the interaction between the rules governing the Single Supervisory Mechanism, SSM, and existing mortgage credit legislation provides a sensible framework for continued supervision of Danish mortgage banks, taking their special business model into account. At the same time, Denmark will have a better opportunity to influence the development of European rules, standards and practices, thereby increasing the probability that future EU regulation will take special national circumstances into account to a sufficient degree.

Overall, Danish participation is expected to make a positive contribution to financial stability in Denmark. Participation would entail enhanced supervision of the largest Danish credit institutions compared with today. At the same time, Denmark would participate in the banking union's Resolution Mechanism, where a central authority, the Single Resolution Board, guarantees credible and consistent application of the rules saying that creditors bear the losses of distressed banks. Common standards and practices across national

borders would also provide a basis for enhanced competition in the market for financial services in Denmark – to the benefit of households and the corporate sector.

If Denmark opts out of the banking union, this decision should be followed up by a renewed assessment of whether to increase capital requirements for the largest credit institutions.

## **MARKET LIQUIDITY AND THE REPO MARKETS**

Market liquidity developments have attracted increasing international attention recently.<sup>3</sup> This applies, inter alia, to liquidity in the repo markets where financial institutions conduct loan transactions against securities as collateral.<sup>4</sup> In this connection, it is being discussed whether new regulation, e.g. leverage ratio, Liquidity Coverage Ratio, LCR, and Net Stable Funding Ratio, NSFR, may have a negative impact on the repo markets.

Repo transactions contribute to financial market liquidity while supporting financial stability, compared with an uncollateralised market. However, in some situations, repo transactions may increase the vulnerability of the financial system.<sup>5</sup> The transactions are typically short-term transactions that need to be rolled over often to ensure longer-term funding. If other funding sources are not available, this entails vulnerability to sudden changes in the repo market, e.g. rising interest rates.

The new regulation sharpens the requirements of institutions' capital and liquidity management. A number of market participants have pointed out that the new regulation will increase the costs of repo transactions, and that this will influence the institutions' incentives to participate in activities in the repo market.

Danish credit institutions conduct repo transactions with their customers and use repo transactions, inter alia, for liquidity management purposes. Some repo transactions take place between intra-group units, e.g. a commercial bank and a mortgage bank. The Danish repo market is dominated by the largest banks.<sup>6</sup> The institutions have both repo deposit and lending activities, overall

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2 ECB's Composite Indicator of Systemic Stress, CISS, see European Systemic Risk Board, *ESRB Risk Dashboard*, March 2015.

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3 See inter alia *Statement* from the Bank of England's Financial Policy Committee, FPC, March 2015.

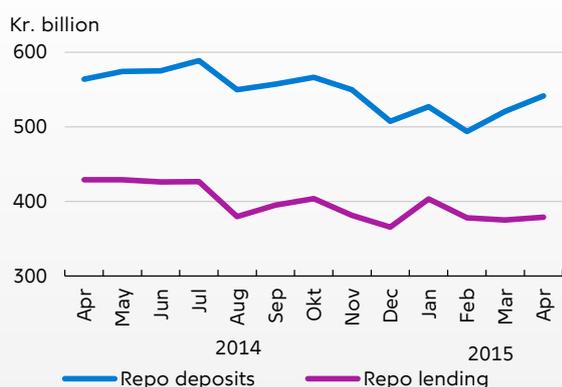
4 The term *repo transactions* in this report covers repo/reverse transactions and securities lending and deposits, etc.

5 See Danmarks Nationalbank, *Financial stability*, 2nd Half 2013.

6 See Danmarks Nationalbank, *Financial stability*, 1st Half 2014.

### Credit institutions' repo deposits and lending

Chart 2.4



Note: The average monthly volume of repo deposits and lending covers repo/reverse transactions, securities lending and deposits, etc. Intra-group transactions have been excluded. The repo transactions of the foreign units of Danish institutions have not been included. The most recent observation is from April 2015.

Source: Danmarks Nationalbank.

participating in the repo market as borrowers, cf. Chart 2.4.<sup>7</sup> Overall, the volume of repo transactions has declined slightly over the last year or so.

The activity and liquidity in the repo market may be influenced by the credit institutions optimising

their financial ratios prior to publishing their financial statements. This may be reflected in end-of-period effects on turnover and interest rates, e.g. if turnover at the end of the year differs substantially from the average turnover in the rest of the year. The turnover of short-term repo transactions in the Danish money market has not shown any signs of end-of-period effects in recent years, except at the end of 2014.<sup>8</sup> In the market for short-term repo transactions in euro, end-of-period effects can be observed as regards both turnover and interest rates, cf. Box 2.1. It is not clear whether these observed effects are caused by new regulation.

## DANISH CREDIT INSTITUTIONS MEET THE LIQUIDITY REQUIREMENTS

### THE BANKS HAVE CONSIDERABLE EXCESS LIQUIDITY COVER

The systemic banks overall have had customer funding surpluses since mid-2013, while the non-systemic banks overall began to have customer funding surpluses at the end of 2012, cf. Chart 2.5.

At end-March 2015, all banks' excess liquidity cover was considerably higher than both the min-

### Regulation and the repo markets

Several regulation measures may influence the repo markets, and the international focus is primarily on the leverage ratio, the LCR and the NSFR. Not all measures have been finalised yet.

The *leverage ratio* is calculated as Tier 1 capital relative to *unweighted* exposures, while the standard capital requirement, i.e. the Tier 1 capital ratio, is calculated as Tier 1 capital relative to *risk-weighted* exposures. Repo transactions are collateralised loans with low risk weights. This means that repo transactions require more capital in the leverage ratio than in the risk-weighted requirement. If a credit institution has to restructure its balance sheet to comply with a leverage ratio target, a reduction of its repo transactions on the assets and liabilities sides will improve the ratio, since unweighted exposures are reduced.

The *LCR* requires the credit institutions to have a buffer of liquid assets sufficient to withstand 30 days of severe

Box 2.1  
continues next page

liquidity stress. This means that the institutions' repo transactions maturing within 30 days are to be covered by the liquidity buffer to a certain extent. The extent depends on the liquidity of the collateral for the repo transaction, among other factors. Moreover, the LCR entails requirements of the composition of the liquidity buffer, inter alia maximum 70 per cent mortgage bonds.<sup>1</sup>

The *NSFR* is calculated as the ratio between available stable funding and required stable funding.<sup>2</sup> The credit institutions are required to have stable funding corresponding to a share of repo lending, i.e. where the institution has granted collateralised loans. Repo deposits, where the institution pledges collateral and receives liquidity, can be included as stable funding, but only if the maturity is at least six months. Hence, short-term repo deposits may not be included as stable funding for short-term repo loans.

<sup>7</sup> In repo deposits collateral is pledged and liquidity received, and in repo lending collateral is received and liquidity delivered.

<sup>8</sup> In this context, turnover includes the turnover of the Tomorrow/Next reporting banks in short-term repo transactions involving lending Danish kroner to other banks against collateral.

**Implementation and end-of-period effects**

The leverage ratio, the LCR and the NSFR are set to take effect in the period 2015-18, but several credit institutions have already initiated the adjustment process.

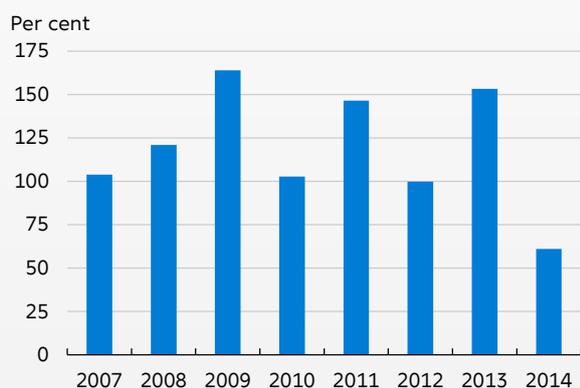
Overall, turnover of short-term repo transactions in the Danish money market has declined since the end of 2011. Turnover was markedly lower at end-2014 than the average for 2014, but a similar end-of-period effect is not observed for previous years, cf. Chart A. But in the Danish uncollateralised

money market end-of-period effects have been observed for several years, as the institutions have been more reluctant to lend uncollateralised liquidity over the turn of a year, quarter or month.<sup>5</sup>

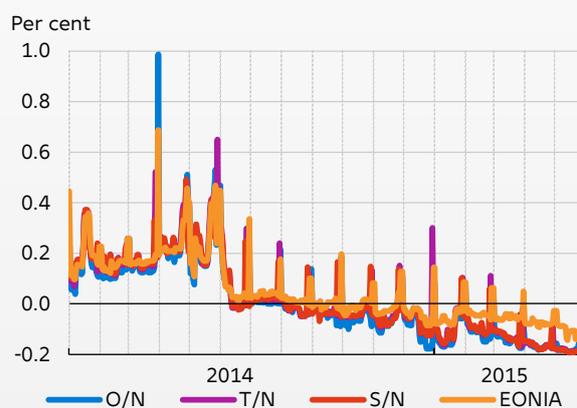
In the market for short-term repo transactions in euro<sup>4</sup> end-of-year effects have been observed in turnover in recent years. Moreover, end-of-month effects can be observed in interest rates in the repo market in euro and also in the uncollateralised European market, cf. Chart B.<sup>5</sup>

**Turnover and interest rates in repo markets**

**Turnover of short-term repo transactions in the Danish money market at year-end relative to average turnover (A)**



**Interest rates in the market for short-term repo transactions in euro (B)**



Note: The left-hand chart shows the average turnover of the T/N reporting banks' short-term repo transactions, i.e. collateralised lending to other banks in Danish kroner, at year-end relative to average turnover of transactions on other days. Short-term repo transactions include Spot-Next (S/N) and Tomorrow-Next (T/N), which accounted for 43-45 per cent of the T/N reporting banks' total turnover of repo loans in 2012-14, cf. Danmarks Nationalbank's Money market survey 2014. The right-hand chart shows the short-term Euro Repo Market, including Overnight (O/N), S/N and T/N and the uncollateralised market, EONIA.

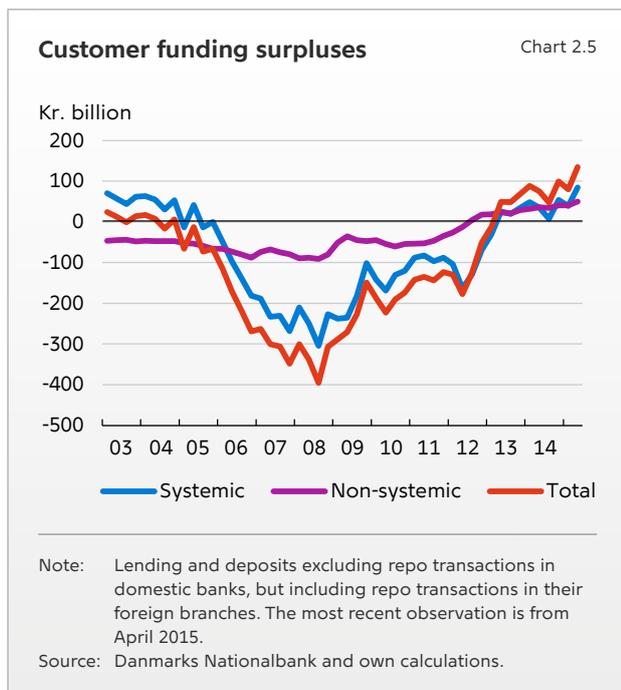
Source: Danmarks Nationalbank and Bloomberg.

1. See Danmarks Nationalbank, *Financial stability*, 1st Half 2014.
2. For more information on the NSFR, see the section *Stable funding requirements*.
3. Cf. Jonas Lundgaard Christensen, Palle Bach Mindsted and Lars Risbjerg, Recent money market trends, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2014.
4. Measured here by short-term repo transactions in euro traded in the Euro Repo Market, Eurex Repo.
5. Corresponding price information about the Danish repo market is not available.

imum requirement and the Supervisory Diamond limit value of 50 per cent.<sup>9</sup> In a stress scenario where the banks are unable to refinance the 10 largest term deposits and all long-term senior debt maturing in 2015-18, all credit institutions maintain excess liquidity cover above 50 per cent at end-2018.

The Danish authorities' extraordinary measures to ensure credit institutions access to liquidity during the financial crisis are now coming to an end. On 10 February 2015, Vestjysk Bank redeemed the last individual government guarantee for non-subordinated, unsecured debt. In July 2014, the access to raise 6-month loans from Danmarks

<sup>9</sup> Excess liquidity cover is calculated according to Section 152 of the Danish Financial Business Act, which states 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.



Nationalbank lapsed. Of the 3-year loans granted by Danmarks Nationalbank in 2012, only kr. 0.2 billion was outstanding on 2 June 2015 out of the total original amount of kr. 53.2 billion. The normalisation of the financial conditions has also enabled Danmarks Nationalbank to simplify the collateral basis in connection with monetary policy loans from Danmarks Nationalbank. From April 2015, Danmarks Nationalbank's collateral basis no longer includes Junior Covered Bonds and bonds issued by Danish Ship Finance. After the adjustment of the collateral basis, the volume of eligible securities is still considerably larger than the volume required in connection with the monetary counterparties' loans from Danmarks Nationalbank.

### **MOST CREDIT INSTITUTIONS MEET THE FUTURE LCR MINIMUM REQUIREMENTS**

As from 1 October 2015, the Liquidity Coverage Ratio, LCR, requirement will apply to European credit institutions. The LCR measures the ratio between liquid assets and the net liquidity outflow in a 30-day severe liquidity stress scenario. The LCR must be complied with at both group and bank level.

In Denmark, a minimum LCR requirement of 100 per cent will apply to the systemic groups from 1 October 2015. The non-systemic banks must comply with a minimum LCR requirement of

60 per cent from 1 October 2015. The requirement will then be generally tightened to a minimum LCR requirement of 100 per cent by 2018. Furthermore, the existing liquidity requirement is maintained as a floor for the non-systemic banks up to and including 2016.

In Danmarks Nationalbank's assessment, the institutions that do not already meet the minimum LCR requirement will be able to make the necessary adjustments by the implementation date.

### **Stable funding requirement**

Besides the LCR, the Basel Committee recommends implementation of the Net Stable Funding Ratio, NSFR, as from 2018. The NSFR entails requirements of credit institutions' funding structure in the medium and long term, complementing the short-term LCR liquidity requirement. The basis for the NSFR is the institutions' total balance sheet, and the NSFR measures the ratio between *available* stable funding and *required* stable funding. In the calculation of *available* stable funding, the credit institution's funding sources are weighted on the basis of their estimated stability. For example, longer-term market funding is more stable than short-term market funding, so it has a higher weight in the calculation of available stable funding. Similarly, the *required* stable funding is calculated by weighting the credit institution's assets according to degree of liquidity, while off-balance sheet items are weighted according to the size of the potential drawdown of the unknown portion of these facilities they may entail. For example, government bonds are more liquid than loans, so their weight in the calculation of required stable funding is generally lower. Hence, the NSFR limits the institutions' maturity transformation.

In the EU it has not yet been clarified whether a stable funding requirement for credit institutions will be implemented. According to plan, the European Commission is to decide on this by end 2016.

The individual member states may maintain or introduce national stable funding requirements before the potential implementation of a binding minimum requirement at EU level. In Denmark, against the background of Bank Rescue Package 6 a working group was established with representatives from the Ministry of Business and Growth, the Danish Financial Supervisory Authority and Danmarks Nationalbank, tasked with examining the

need for a special Danish stable funding requirement for systemic banks. In a report from April 2015, the working group assesses that it would not be expedient to introduce a stable funding requirement for Danish systemic banks prior to a possible EU requirement as from 2018. The report recommends that introducing a Danish requirement in this area be reconsidered in the absence of agreement on a common EU requirement.

## THE DANISH CREDIT INSTITUTIONS ARE ROBUST

Measured by a number of key risk indicators, the five largest systemic groups have increased their robustness in recent years, cf. Chart 2.6. Differences in the levels of individual risk indicators across the groups could reflect different business models.

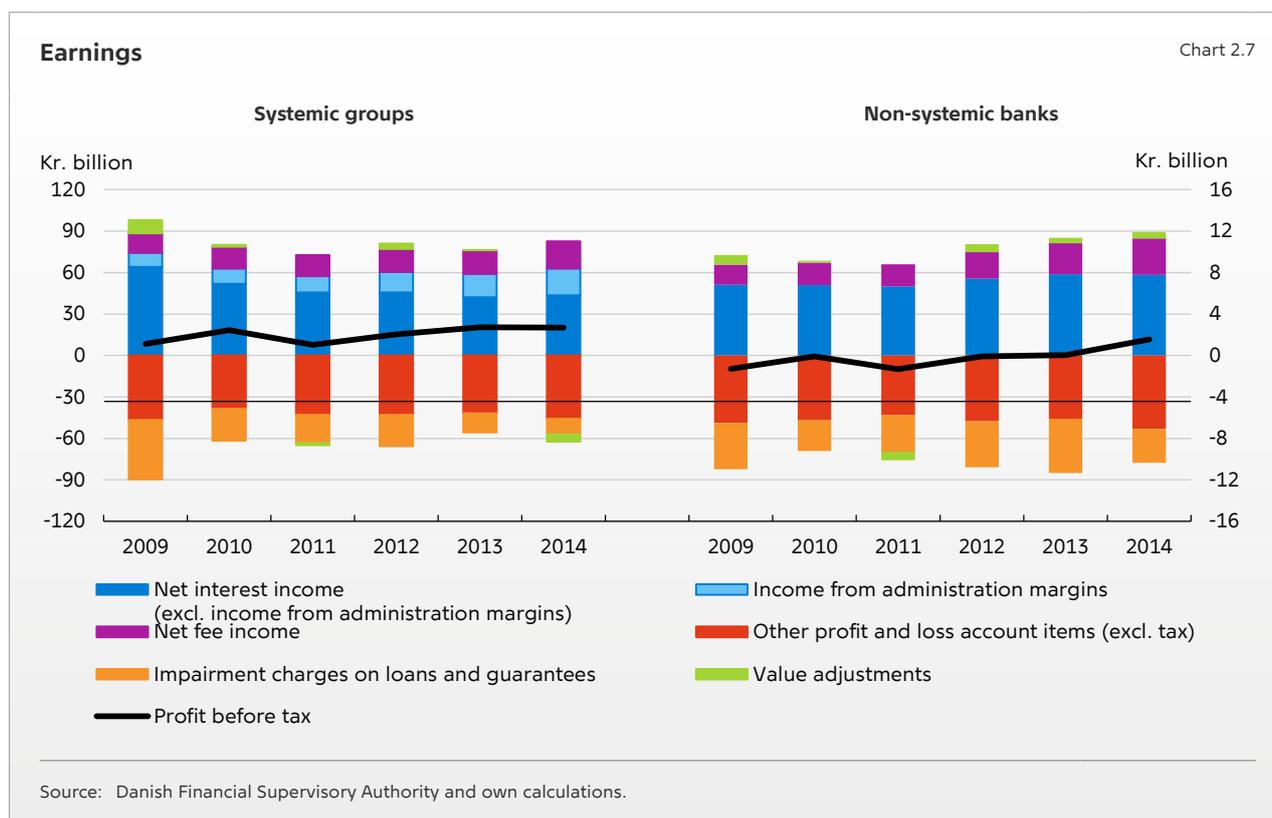
### RISE IN THE INSTITUTIONS' UNDERLYING EARNINGS

In 2014, the earnings of the systemic groups were at the same level as in 2013, cf. Chart 2.7. Earnings in 2014 were influenced by the institutions' profit from the sale of shares in Nets, Jyske Bank's

recognition of badwill from the acquisition of BRFkredit as income and Danske Bank's write-down of goodwill. Disregarding these one-off effects, the groups' total earnings exceeded the 2013 level. The loan impairment charges of the systemic groups continued to decrease in 2014 relative to the previous years.

Net fee income and income from administration margins on mortgage loans account for a growing share of income for the systemic groups. Overall, income from administration margins have almost doubled from 2009 to 2014. The increase in income from administration margins is attributable partly to continued growth in mortgage lending, partly to higher, more differentiated administration margins. The rise in net fee income continued in the 1st quarter of 2015, driven by high remortgaging activity in the wake of the falling interest rates, among other factors.

The higher income from administration margins for mortgage loans have contributed to increasing the capitalisation of the groups' mortgage banks. One mortgage bank, Realkredit Danmark, disbursed most of the profit for 2014 to its parent company, Danske Bank, but still has the highest excess capital adequacy among the mortgage banks. No other mortgage banks disbursed dividend for 2014.





**Credit risk (K):**

*Lending growth (K1):* Annual lending growth before loan impairment charges excluding repos.

*Property exposures (K2):* Share of total lending and guarantees to the “real property” and “implementation of building projects” industries.

**Market risk (M):**

*Market risk (M1):* Risk-weighted exposures with market risk relative to Common Equity Tier 1 capital.

*Trading assets (M2):* Assets in the trade portfolio and financial assets disposable for sale as a percentage of total assets.

**Liquidity risk (L):**

*Excess liquidity cover (L1):* Excess liquidity cover pursuant to Section 152 of the Danish Financial Business Act.

*Short-term market funding (L2):* Debt to credit institutions and central banks and issued bonds with a remaining time to maturity of up to one year as a percentage of total liabilities. Since it is not possible to exclude debt to central banks from the indicator, the volume of short-term market funding may appear larger than the actual level.

**Resilience (R):**

*Return on equity (R1):* Profit after tax as a percentage of average equity (p.a.).

*Common Equity Tier 1 capital (R2):* Common Equity Tier 1 capital is expressed as a percentage of the risk-weighted exposures.

Note: Financial statements and SNL Financial.

Source: An increased distance to the centre of the cobweb indicates that the risk has increased or that the resilience of the indicator in question has been reduced.

<sup>1</sup> Data for this indicator is solely for the systemic bank.

<sup>2</sup> Lending growth for Jyske Bank has been adjusted for the acquisition of BRFKredit.

Disregarding income from administration margins, other net interest income for the systemic groups was slightly higher than in the previous year. One reason is that the systemic banks that had received government Additional Tier 1 capital have now redeemed it. Nevertheless, net interest income excluding administration margins declined in the 1st quarter of 2015 relative to the 4th quarter of 2014. A prolonged period with very low or negative interest rates could put pressure on the institutions' earnings, cf. Chapter 4.

Some systemic groups had considerable negative value adjustments in 2014. This was partially due to loan impairment charges for customers with weak finances, with whom the groups had previously entered into interest-rate swap agreements. Often customers have entered into interest rate swap agreements in order to swap variable interest payments on their loans for fixed interest payments. The falling level of interest rates has caused the market value of such swaps to rise, entailing larger expected credit losses on those customers for the groups.

The profits of the non-systemic banks rose substantially in 2014 relative to the previous year, although the non-systemic banks' earnings continue to vary strongly. Higher earnings were to a high degree driven by lower loan impairment charges, and especially loan impairment charges on commercial properties had fallen considerably compared with recent years.<sup>10</sup>

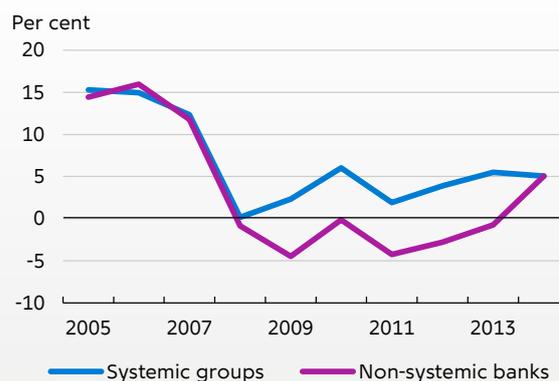
In recent years, some systemic groups and non-systemic banks have implemented cost-saving measures such as staff reductions and branch closures. The effect of these measures is slowly beginning to emerge in the financial statements for 2014, although there is no great impact on the sector's total level of costs.

## REQUIRED RETURN ON EQUITY MUST REFLECT MARKET CONDITIONS

Credit institutions often have return on equity, ROE, targets of around 8-12 per cent for the large

Return on equity

Chart 2.8



Source: Danish Financial Supervisory Authority and own calculations.

European credit groups.<sup>11</sup> In Denmark, the actual ROE has decreased to 5 per cent from an unusually high level of around 15 per cent in the years leading up to the financial crisis, cf. Chart 2.8.

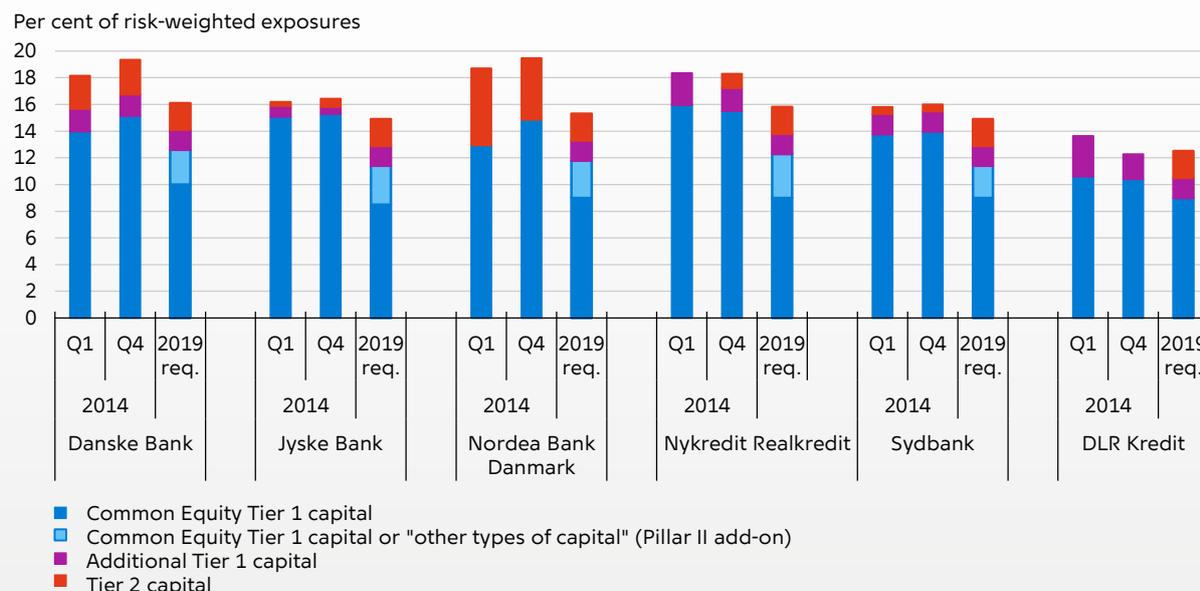
The credit institutions' own ROE targets often depends on investor requirements for return. Return requirements should generally reflect the levels of two elements. The first element is the risk-free interest rate, reflecting the return which an investor can expect at any time without assuming risk. The declining government bond yields show that the risk-free interest rate has fallen. The second element is the investor's risk premium for investment in a credit institution. The risk depends on the volatility of the credit institution's assets and its capitalisation. The banks have increased their capitalisation and collateralisation requirements since the financial crisis. The banks' liquidity reserve has improved over the same period. Overall, the risk of investing in Danish credit institutions has declined in the years after the financial crisis. The return requirements for Danish credit institutions, and hence their ROE targets, should therefore, under the current market conditions, be considerably lower than the very high level seen before the financial crisis. Several large European credit groups have reduced their ROE targets in recent years.

10 In this context, commercial properties cover leasing of real property and purchase and sale of real property.

11 For a survey of own ROE requirements in the 39 largest European credit groups, see European Banking Authority, *Risk assessment of the European banking system*, December 2014. Danske Bank is the only Danish group participating in the survey and has published an ROE target of 9.5 per cent for 2015, rising to 12.5 per cent by 2018 at the latest.

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

Chart 2.9



Note: Capital base have been calculated as on 31 March and 31 December 2014, and the phasing-out of transition rules until 2021 has not been taken into account. The current Pillar II add-on of the credit institutions is assumed to be unchanged until 2019. The current countercyclical capital buffer rate of 0 has been applied. The institutions are not required to use Additional Tier 1 capital and Tier 2 capital to comply with the requirement, since all capital requirements can be met using Common Equity Tier 1 capital.

Source: Danish Financial Supervisory Authority and own calculations.

### EXCESS CAPITAL ADEQUACY MAY DIMINISH IN STEP WITH THE IMPLEMENTATION OF NEW REQUIREMENTS

All systemic groups have substantial excess capital adequacy relative to the current requirements. A level of capitalisation beyond the capital requirement provides the credit institution with a buffer in the event of unexpected credit losses.

The excess capital adequacy of the non-systemic banks varies considerably, i.e. some banks have substantial excess capital adequacy, while other banks are close to the current minimum requirement.

The capital requirements of the credit institutions will increase in the coming years. The implementation of the common European requirements in CRDIV/CRR has entailed an enhanced framework for the Danish requirements, including SIFI capital buffers, a capital conservation buffer and a countercyclical capital buffer. The SIFI capital buffers and the capital conservation buffer will be phased in gradually until 2019. The countercyclical capital buffer could be determined for

the first time in January 2015. In accordance with recommendations from the Systemic Risk Council, the Minister for Business and Growth has set the countercyclical capital buffer rate at 0 per cent. The buffer rate is to be set on a quarterly basis. If the Systemic Risk Council finds that the buffer rate should be raised, it will submit a recommendation to that effect to the Minister for Business and Growth. The Systemic Risk Council's method for assessment of the buffer rate is described in Box 2.2.<sup>12</sup>

At end-2014, all systemic and non-systemic credit institutions except DLR Kredit and Vestjysk Bank complied with the fully phased-in 2019 capital requirements. Some of the institutions have only limited excess capital adequacy relative to the fully phased-in requirements, cf. Chart 2.9. This also applies to the non-systemic banks. It is to be expected that the banks which only just comply with the fully phased-in capital requirements today will gradually increase their capitalisation over the coming years so that they are not too close to the capital buffer requirements.

<sup>12</sup> For a more detailed description, see the memo *The countercyclical capital buffer* at [www.risikoraad.dk](http://www.risikoraad.dk).

The countercyclical capital buffer is to strengthen the resilience of the credit institutions in a crisis situation. The buffer may be implemented during periods of increasing systemic risk. The purpose is to facilitate the scope for the credit institutions to maintain suitable credit extension in periods of stress in the financial system. Ideally, the buffer should be built up before the tide turns to ensure that the institutions are more resilient when the financial system is exposed to stress. In that situation, the buffer can be released, and the institutions may use the capital to e.g. absorb losses.

In addition to the primary purpose of strengthening the institutions' resilience, a possible side benefit is that the actual build-up of the countercyclical capital buffer in good times may dampen credit growth, thereby reducing the build-up of systemic risks. It is difficult to quantify the effect on credit growth, but the effect should not be overestimated in periods of great optimism and high credit growth where it will be relatively easier for the institutions to increase their capital. The buffer should not be regarded as an instrument to influence cyclical fluctuations.

The Systemic Risk Council may issue recommendations regarding setting the countercyclical buffer rate. The approach to assessing the buffer rate comprises three steps:

- Monitoring five key indicators
- Other considerations, including other indicators and policy measures
- Advice on the buffer rate

The Systemic Risk Council has selected five key indicators to capture situations of vulnerabilities building up in the financial system, which may cause the buffer to be activated. The key indicators were selected mainly so as to make sense based on economic arguments, while being mutually complementary. The indicators are to capture excessive credit extension, unsustainable increases in house prices, a heavy debt servicing burden in the private sector, high leverage of the banks and lenient credit conditions measured in terms of the banks' interest spread on new lending to households, cf. Charts A-E. The indicators were also assessed based on their historical performance in relation to financial crises in both Denmark and abroad. However, there was a limited

number of crises in the period for which data is available while developments in the indicators were also affected by policy measures in the periods under review. In its forward-looking assessment of the indicators, the Systemic Risk Council takes both the level and recent developments into account.

According to international guidelines, a buffer guide is to be calculated when the credit-to-GDP gap in Chart A exceeds a threshold of 2 percentage points.<sup>1</sup> The buffer guide – shown in Chart F – is a mechanical calculation based on the credit-to-GDP gap.

In step 2, the key indicators are supplemented by other quantitative and qualitative information. Developments in other indicators is used to put key indicator developments into perspective and provide an overview of the overall risk outlook.<sup>2</sup> Furthermore, other policy measures are also taken into account when setting the buffer rate. These may include other measures that are better suited to addressing the risks identified, including other microprudential or macroprudential requirements. Other planned measures, e.g. fiscal measures, may also be relevant to take into account.

In step 3, the Systemic Risk Council determines the level of the buffer rate based on an overall assessment of steps 1 and 2. When the buffer rate is changed, the Systemic Risk Council will publish a recommendation addressed to the Danish Minister for Business and Growth, who is responsible for determining the buffer rate in Denmark every quarter. If the buffer rate is unchanged, including at zero, the advice is published when deemed relevant by the Systemic Risk Council. Data underlying the key indicators is released quarterly.

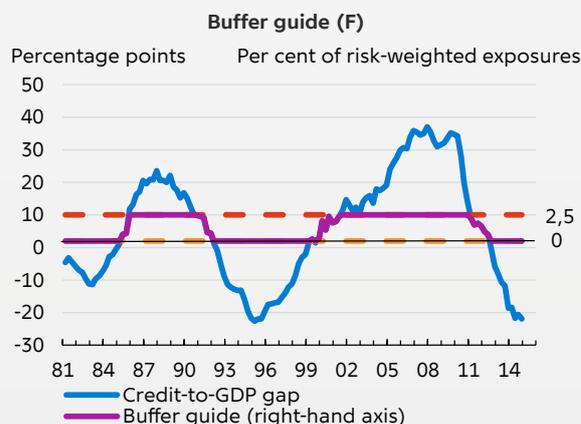
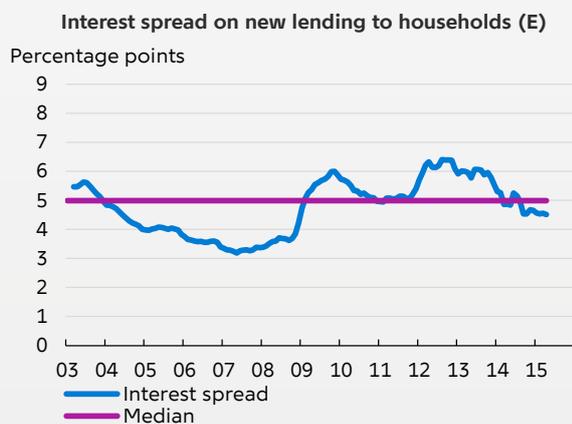
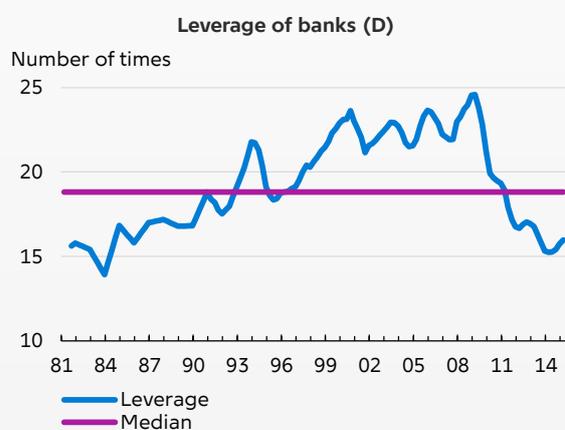
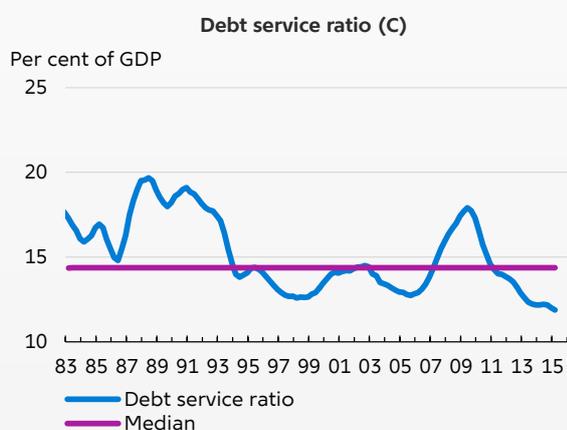
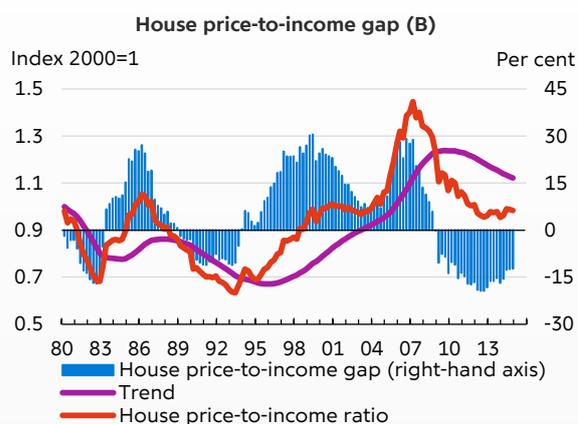
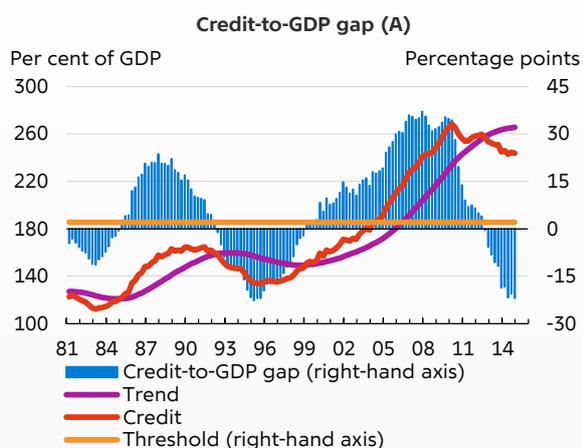
The countercyclical capital buffer could be determined for the first time on 1 January 2015. The buffer framework is to be gradually phased in, cf. the Danish Financial Business Act. The buffer rate can be set at up to 0.5 per cent of risk-weighted exposures in 2015, 1 per cent in 2016, 1.5 per cent in 2017, 2 per cent in 2018 and 2.5 per cent in 2019. After that time, the buffer rate can then be set higher than 2.5 per cent if this is justified by the assessment basis. For instance, if the development in e.g. credit extension in the period up to 2019 warrants setting a countercyclical buffer in excess of the framework for the relevant year, new legislation will be required.

1. Cf. recommendation from the European Systemic Risk Board, ESRB, concerning guidelines for setting the countercyclical capital buffer rates of 18 June 2014 and Basel Committee, *Guidance for national authorities operating the countercyclical capital buffer*, December 2010. According to international guidelines, when the buffer guide is greater than zero, the relevant authorities must as a minimum consider whether to activate the countercyclical capital buffer. However, there will be no mechanical link between the buffer guide and the final advised buffer rate, as other quantitative and qualitative information must also be taken into account in the assessment.

2. For details about the Systemic Risk Council's general risk monitoring, see the memo "Monitoring of systemic risks" on [www.risikoraad.dk](http://www.risikoraad.dk).

3. Abildgren, *Financial Liberalisation and Credit Dynamics in Denmark in the post-World War II Period*, *Danmarks Nationalbank*, Working Paper 47, October 2007 and Abildgren, *Business cycles, Monetary Transmission and Shocks to Financial Stability – empirical evidence from a new set of Danish quarterly national accounts 1948-2010*, *Danmarks Nationalbank*, Working Paper 71, November 2010.

## Key indicators



Note: A and B are defined as deviations of credit/GDP and house price/income, respectively, from a long-term trend estimated using a recursive HP filter with an initialisation period of 5 years. C is defined as households' and non-financial corporations' interest payments and debt repayments relative to GDP. D is defined as the sum of assets, guarantees and commitments divided by Tier 1 capital (including Additional Tier 1 capital). E is defined as the banks' lending rate on new lending, excluding overdrafts, relative to Denmark's Nationalbank's lending rate. F is calculated as  $(0.3125 * A) - 0.625$ , when A is between 2 and 10 percentage points, cf. international recommendations. F is 0, when A is smaller than 2 percentage points. F is 2.5, when A is greater than 10 percentage points. C and D are 4-quarter moving averages, and E is 3-month moving averages. The series have been adjusted for data breaks back in time.

Source: Abildgren (2007) and (2010)<sup>3</sup>, Statistics Denmark, the MONA data bank, Danish Financial Supervisory Authority, Denmark's Nationalbank and own calculations.

Danmarks Nationalbank's stress test shows that the systemic banks are robust. The five systemic banks have considerable excess capital adequacy in relation to the minimum requirements in 2017 in all stress test scenarios, cf. Chapter 3. In the most severe stress test scenario, some non-systemic banks will have a capital shortfall by the equivalent of about 0.3 per cent of the total risk-weighted exposures of the stress test population relative to compliance with the minimum requirements.

Overall, the systemic groups considerably increased their dividend payments relative to 2013, but the dividend payments did not exceed the profit for the year (excluding goodwill) for the institutions, implying a slight increase in capitalisation in 2014.

Two systemic groups, Danske Bank and Sydbank, have implemented share buy-back programmes. At end-2014, both groups' Common Equity Tier 1 capital exceeded their respective targets. Danske Bank issued Additional Tier 1 capital

### Capital requirements for systemic institutions in countries outside the banking union

Box 2.3

As from 2019, the systemic groups in Denmark must comply with a Common Equity Tier 1 capital requirement of 8-10 per cent of risk-weighted exposures. In addition, there will be requirements that can be met using other capital instruments, i.e. Additional Tier 1 capital or Tier 2 capital. Overall, Denmark has the lowest capital requirements for systemic institutions compared with other countries outside the banking union which also have large financial sectors, cf. the table.

In Sweden and Norway, the authorities have implemented higher capital requirements for systemic institutions than in Denmark, but also measures regarding housing loans, entailing even higher capital levels for the systemic institutions.

Sweden's financial supervisory authority, Finansinspektionen, has introduced a floor of 25 per cent for risk weights for housing loans. The floor has been implemented under Pillar II. This implies no increase of risk-weighted exposures. Instead, the effect of the floor is converted to a Pillar II add-on. Calculations from Finansinspektionen show that the floor increases the Pillar II add-on for the systemic institutions by 1.4-6.3 per cent of risk-weighted exposures, to be covered predominantly by Common Equity Tier 1 capital. The Pillar II add-ons are not reflected in the table, since unlike Danish institutions, the Swedish institutions are not obliged to publish their individual capital needs.

Norway's financial supervisory authority, Finanstilsynet, has chosen to increase the risk weights for housing loans under Pillar I. Hence, institutions applying the IRB approach must calculate their risk-weighted exposures on the basis of a loss given default, LGD, ratio of at least 20 per cent. In accordance with the rules on reciprocity, Danish institutions using the IRB approach will also have to apply an LGD ratio of at least 20 per cent for housing loans in Norway.

New international requirements are forthcoming, aimed at supplementing the capital requirements and increasing the institutions' loss-absorbing capacity. The implementation of the Crisis Management Directive, BRRD, entails that all credit institutions in the EU will be subject to an individual minimum requirement for own funds and eligible liabilities, MREL, to be determined by the national resolution authorities. Concurrently, in November 2014 the Financial Stability Board, FSB, presented a proposal for a global standard for minimum amounts of Total Loss Absorbency Capacity, TLAC, to be held by global systemically important banks.<sup>1</sup> The TLAC requirement is expected to be approximately 16-20 per cent of risk-weighted exposures and at least 6 per cent of unweighted exposures. Nordea is the only institution in the Nordic countries which is expected to be directly comprised by the TLAC requirement.

### Expected capital requirements for systemic institutions as on 1 January 2019

Per cent of risk-weighted exposures	Common Equity Tier 1 capital	Other capital	Total
Denmark	8-10	3.5	11.5-13.5
Sweden	12	3.5	15.5
Norway	12	3.5	15.5
UK	8-10	3.5	11.5-13.5
Switzerland	10	9	19

Note: Requirements excluding the countercyclical capital buffer and individual Pillar II add-ons.

<sup>1</sup> The FSB proposal is described in more detail in Box 2.1 in Financial stability, 2nd Half 2014.

for 750 million euro in February, while Sydbank raised Tier 2 capital in the market for 100 million euro in March 2015. Additional Tier 1 capital and Tier 2 capital are debt instruments that may be included in the calculation of the capital base, according to CRD IV/CRR, but they are of lower quality than Common Equity Tier 1 capital.<sup>13</sup>

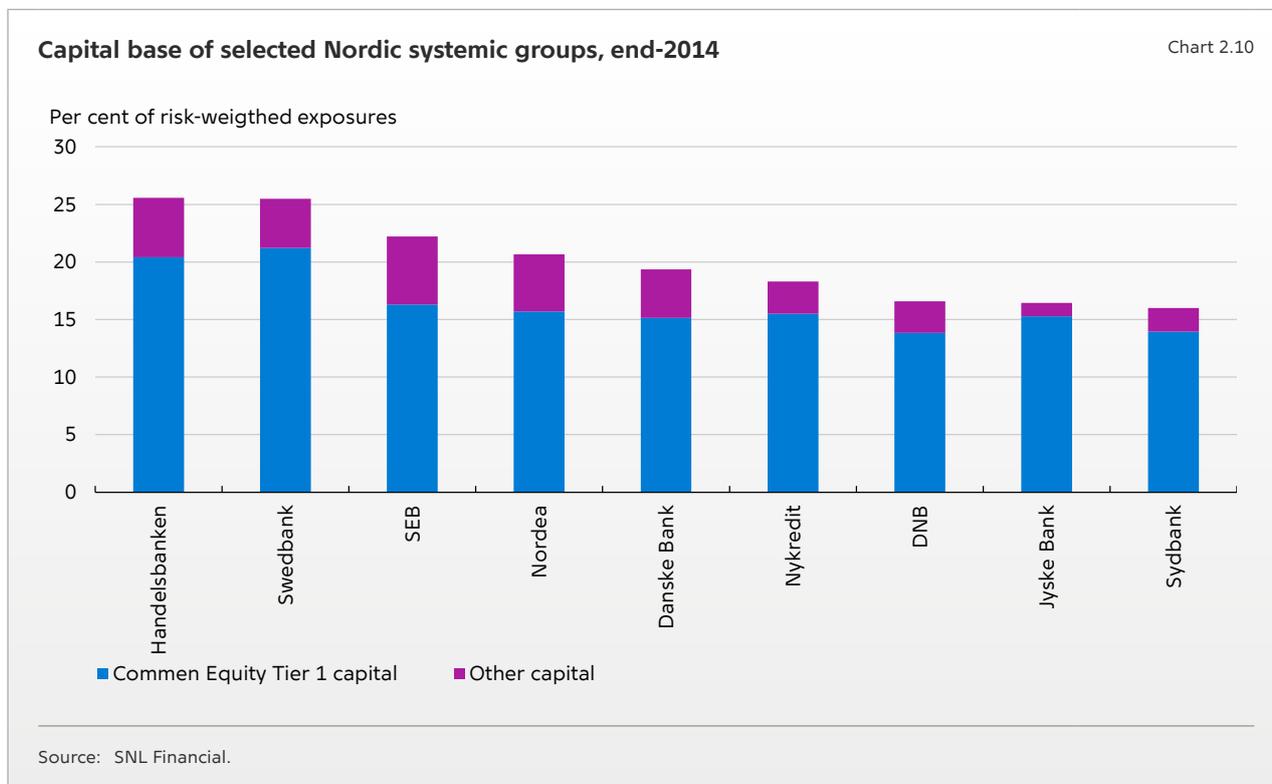
### THE CAPITAL REQUIREMENTS MAY BE TIGHTENED FURTHER

If Denmark opts out of the banking union, the basis for comparison regarding Danish credit institutions is expected to be institutions in other non-members of the banking union, e.g. the UK, Sweden, Norway and Switzerland, which also have large financial sectors. In these countries, capital requirements for the largest institutions are generally higher than the fully phased-in requirements in Denmark, cf. Box 2.3. Outside the banking union, Danish credit institutions will not obtain the quality stamp which the single ECB supervision is expected to constitute. Consequently, it is important that the systemic groups are prepared for possibly higher market requirements of the capitalisation of Danish credit institutions outside

the banking union than those applying inside the banking union. Today, the capitalisation of several Danish systemic groups is lower than the capitalisation of e.g. the largest Swedish and Norwegian credit institutions, cf. Chart 2.10.

In Danmarks Nationalbank's opinion, if Denmark opts out of the banking union, it should be carefully considered whether the Danish capital requirements of the systemic groups are sufficiently high, cf. the section on the banking union above.

International discussions of further capital requirement measures are still going on with the aim of strengthening financial stability and ensuring a level playing field for credit institutions. Cases in point are the Basel Committee's proposal for a new standardised approach for calculation of risk-weighted exposures and a new capital floor for risk weights, cf. Box 2.4, as well as a number of potential policy measures aimed at better reflecting the risks associated with sovereign exposures compared with the very low risk weights in the current regulation, cf. Box 2.5. The proposals are still only briefly outlined, so their effect on the capital base of Danish credit institutions is un-



<sup>13</sup> See Danmarks Nationalbank, Capital instruments, *Financial stability*, 1st Half 2014, Chapter 4.

In late 2014, the Basel Committee proposed revisions to the standardised approach for credit risk for calculation of institutions' risk-weighted exposures.<sup>1</sup> At the same time, it was proposed to introduce a new capital floor for credit institutions applying internal ratings-based models when calculating risk-weighted exposures. These proposals will have an impact on the capital requirements for credit institutions. How and to what extent remains to be seen, since the definitions and levels of risk weights and the capital floor are not yet in place. The Basel Committee plans to publish the final standards, including implementation arrangements, around the end of 2015.

**Revised standardised approach**

The revised standardised approach is to encourage credit institutions to more independent and appropriate risk management. Risk weights are to reflect the actual risk of the exposures to a higher degree than under the current standards. This can be achieved, inter alia, by updating risk weights and linking them to selected risk drivers for the

exposure or the borrower. This also reduces the reliance on external credit assessments, and according to the proposal, over-reliance on such ratings in standards, regulations and legislation may induce the institutions to be less than thorough in their own assessments of the exposures.

Moreover, the definitions are to be clearer in order to reduce the scope for interpretation across banks and countries. The changes should also increase comparability of risk weights whether they are calculated using the standardised approach or the IRB approach. A general increase of capital requirements is not an objective.

The most important changes to the various categories of exposures are described in the table below. In addition, it is proposed to give off-balance sheet items a higher weight in the calculation of risk-weighted exposures. It is also considered to implement simpler rules for how to include measures to reduce credit risk, e.g. third-party guarantees, as risk-weighted exposures for institutions. It is also considered whether to update the regulatory haircuts for potential financial collateral underlying the exposures.

**Risk weights for credit risk under the standardised approach**

Exposure	Proposal	Current
Sovereigns	No change.	External credit ratings, but with exceptions, e.g. in EU regulation where the risk weight of exposures to other EU member states can be zero.
Bank	Risk weights based on excess capital adequacy (CET1 ratio) and asset quality (share of non-performing assets).	Risk weights based on credit rating of the institution or the institution's home country.
Corporate	Classification into senior corporate exposures, specialised lending exposures and capitalinstruments. Senior exposures: Risk weights based on leverage and revenue. Higher risk weights for specialised lending and capital instruments.	Risk weights based on credit rating. Flat weight of 100 per cent in the absence of a credit rating.
Retail	Risk weight of 75 per cent if compliance with previous criteria. In addition, one borrower must not account for more than 0.2 per cent of total retail exposures. Furthermore, more risk divisions are being considered.	Risk weight of 75 per cent subject to compliance with certain criteria, such as the exposure, excluding exposures secured by residential real estate, not exceeding 1 million euro.
Exposures secured by residential real estate	Risk weights based on the LTV and the borrower's ability to service the debt relative to income.	Risk weight of 35 per cent for fully secured exposures (in Denmark the mortgage must not exceed 80 per cent of the property value).
Exposures secured by commercial real estate	It is being considered whether risk weights are to be linked to the counterparty or the LTV.	Risk weight of 50 per cent for fully secured exposures (in Denmark the mortgage must not exceed 50 per cent of the property value).

<sup>1</sup> See Basel Committee, *Revisions to the Standardised Approach for credit risk*, December 2014 and Basel Committee, *Capital floors: the design of a framework based on standardized approaches*, December 2014.

**Capital floor based on the standardised approach**

The Basel Committee has proposed a floor for IRB-based calculations of risk-weighted exposures, given as a certain share of risk-weighted exposures calculated using the revised standardised approach. The floor is to mitigate the effects of possibly too low risk weights when using the IRB approach due to model risks, measurement errors and inappropriate incentives.

The proposed capital floor is to replace the current Basel I floor that an institution applying for the IRB approach

should hold own funds which are more than or equal to 80 per cent of the total minimum amount of the own funds that the institution would be required to hold under Basel I. These rules are now outdated, which increases the need for replacing the current floor.

The proposal is very loosely outlined. For instance, it does not contain a capital floor level, and it is not stated whether the floor is to apply to total risk-weighted exposures or to the individual exposure categories.

certain. However, the proposal for a capital floor could potentially have considerable consequences for credit institutions in Denmark and the other Nordic countries, which apply relatively low risk weights to mortgage loans compared with institutions in other countries.

**Ongoing negotiation in the EU of implementation of supplementary leverage ratio**

The CRDIV/CRR implemented the leverage ratio in the EU as a supplementary measure of credit institutions' capital base. While the Tier 1 capital ratio is calculated as Tier 1 capital relative to

**New ESRB report on regulatory treatment of sovereign exposures**

Government bonds are normally regarded as an asset class with low credit and liquidity risk, inter alia because the central government has the right to impose taxes. This does not necessarily mean that government bonds are risk-free, since history shows that several sovereigns have defaulted on their payment obligations.<sup>1</sup>

In March 2015 an expert group under the ESRB presented a report on regulatory treatment of sovereign exposures.<sup>2</sup> The report describes the treatment of sovereign exposures under international regulation and analyses available data on portfolios of government bonds, mainly for credit institutions in the euro area. Against this background the report describes a number of potential policy measures:

1. Stricter capital requirements for sovereign exposures.
  - a. Removing the general zero risk-weighting of domestic (and other EU countries) sovereign exposures in the standardised approach.
  - b. Introducing a non-zero risk-weight floor for sovereign exposures in the standardised approach.
  - c. Reducing mechanistic reliance on external credit ratings in the standardised approach.
  - d. Setting a minimum (regulatory) floor in the IRB approach.
2. Diversification requirements.
  - a. Fully or partially removing the exemption of sovereign exposures from the large exposures regime.

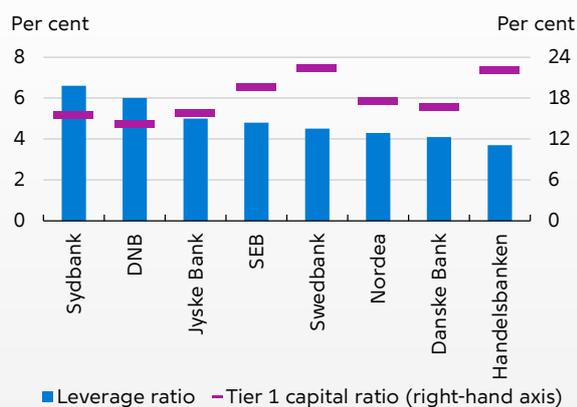
- b. Introducing a capital requirement for concentration risk.
3. Coverage of sovereign exposures in macro-prudential regulation, e.g. by allowing the capital requirement to vary over the financial cycle.
4. Enhanced requirements for calculation of individual Pillar II add-ons, e.g. guidance on stress tests and/or qualitative guidance on diversification.
5. Enhanced disclosure requirements on banks' sovereign exposures, e.g. by implementing mandatory templates for disclosure.
6. Consideration of alternative approaches to treating government bonds in liquidity regulation.

The potential policy options are all very briefly outlined. The expert group points out that the options require further analysis and calibration. For example, the potential interaction between the options has not been considered. The expert group also points out that the outlined options are not intended to be introduced in the current economic situation, but are aimed at ensuring financial stability in the longer term. Moreover, several of the options will require a relatively long phasing-in period. The work schedule of the Basel Committee for 2015 and 2016 also contains a review of the existing regulatory treatment of sovereign exposures.

1. See Brian Liltoft Andreasen, Morten Niels Haastруп, Thorsten Meyer Larsen and Lindis Oma, Favourable treatment of government bonds in financial regulation, Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2015.

2. ESRB, *Report on the regulatory treatment of sovereign exposures*, 2015.

**Leverage ratio and Tier 1 capital ratio for selected Nordic systemic groups, end-2014** Chart 2.11



Note: The numerator is Tier 1 capital in both the Tier 1 capital ratio and the leverage ratio. The denominator in the Tier 1 capital ratio is total risk-weighted exposures, while the denominator in the leverage ratio is total unweighted exposures. The systemic groups may have used different definitions of the unweighted exposures in their financial statements.

Source: Financial statements.

risk-weighted exposures, the leverage ratio is calculated as Tier 1 capital relative to unweighted exposures.

The Danish Financial Supervisory Authority may determine individual Pillar II add-ons on the basis of a credit institution's leverage. At end-2014, all Danish systemic groups had a leverage ratio above 3 per cent, which is the proposed minimum requirement in the current proposal from the Basel Committee, cf. Chart 2.11. It may be difficult to compare levels across groups, because the systemic groups may have used different definitions of unweighted exposures in their financial statements.

In 2016, the European Commission is to present a proposal for possible introduction of a minimum leverage ratio requirement in the EU as from 2018, and the possible level of such a minimum requirement.

For the leverage ratio as for any other kind of financial regulation, it is important to take into consideration its potential effects on actors' incentives and behaviour. Risk-based capital requirements – including use of IRB models – give the credit institutions an incentive to manage their risk and portfolio structure in an appropriate way. A binding target for the leverage ratio, on

the other hand, could mean that institutions with low average risk weights are given an incentive to take on more risk.

Danmarks Nationalbank finds that a requirement for disclosure of the leverage ratio, without a binding minimum requirement, may contribute to supporting the risk-based requirement. If the disclosed leverage is high, the market can be expected to require further information describing whether the risk-based capital requirement is unnaturally low – e.g. due to too optimistic modelling of risk weights.<sup>14</sup>

## CURRENT MARKET CONDITIONS MAY ENTAIL PRESSURE ON CREDIT STANDARDS

Total lending by credit institutions to households and corporate customers has been virtually stable after the financial crisis, cf. Chart 2.12 (left). The level of debt for Danish households is thus still very high in an international context.<sup>15</sup> The stable lending masks a downward trend in lending by banks and an upward trend in lending by mortgage banks. The development should be viewed in the light of the smaller decrease in interest rates on bank loans compared to mortgage loans. Lending to both households and corporate customers has increased slightly in 2015.

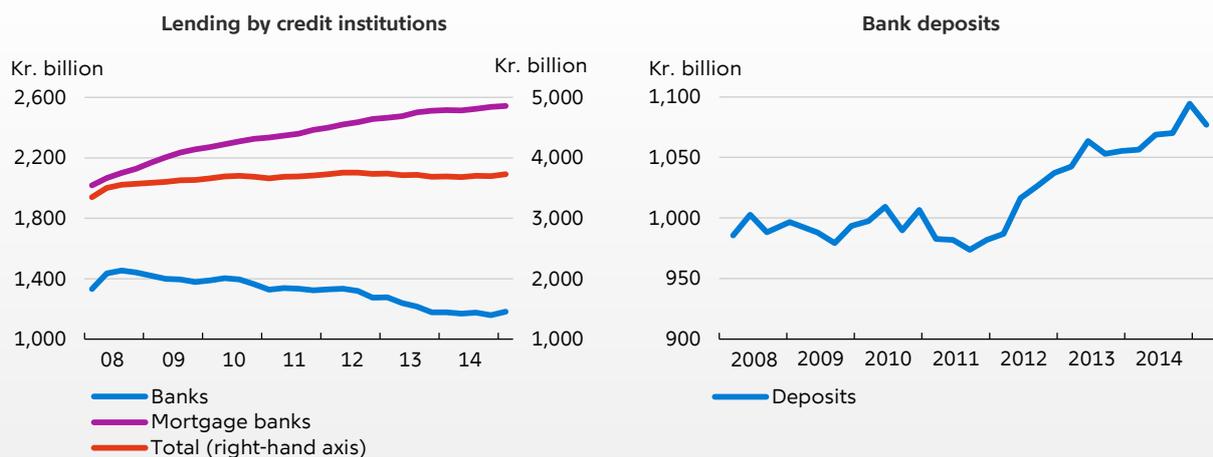
While lending by credit institutions has remained unchanged after the financial crisis, bank deposits have risen, cf. Chart 2-12 (right). This reflects that both retail and corporate customers have increased their aggregate deposits since 2011 rather than reducing their aggregate debt to credit institutions. Over the last decades, the interest margin, i.e. the difference between the banks' average lending and deposit rates, has narrowed considerably, cf. Chart 2.13 (left). As regards mortgage loans, the rate of interest on short-term adjustable rate loans has also fallen to a very low

<sup>14</sup> For an analysis of the interaction between risk-weighted capital requirements and the leverage ratio, see Danmarks Nationalbank, *Leverage ratio, Financial stability, 1st Half 2014, Chapter 5.*

<sup>15</sup> At the same time, the households have considerable wealth in the form of housing wealth, pension wealth and other financial assets, see Jacob Isaksen, Paul Lassenius Kramp, Louise Funch Sørensen and Søren Vester Sørensen, *Household balance sheets and debt – an international country study, Danmarks Nationalbank, Monetary Review, 4th Quarter 2011, Part 2.*

## Lending and deposits

Chart 2.12



Note: The charts show total lending and deposits for households and corporate sector.  
Source: Danmarks Nationalbank. The most recent observation is from the 1st quarter of 2015.

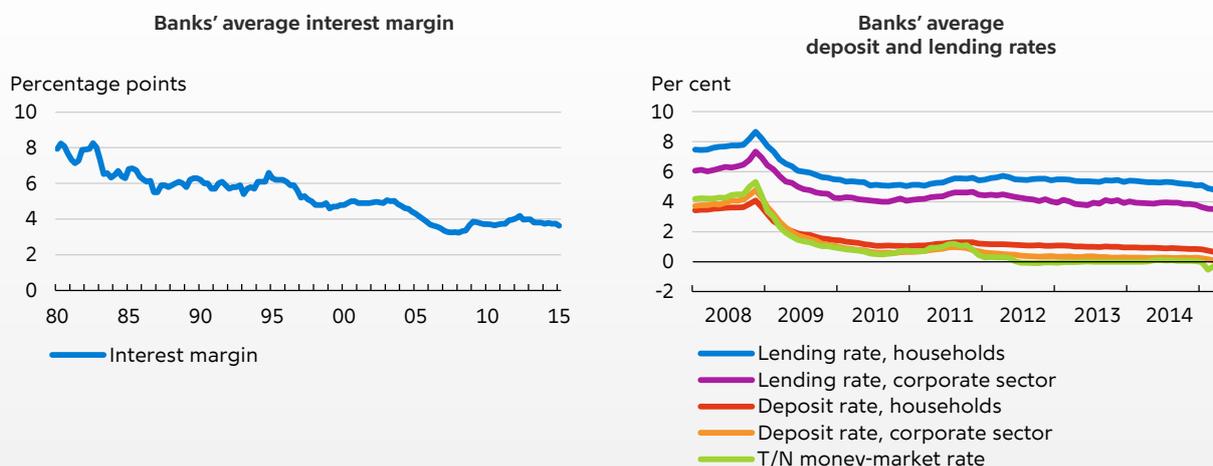
level. Overall it has become less costly to have deposits and loans at the same time.<sup>16</sup>

The banks' average lending rates have fallen slightly since 2012, cf. Chart 2.13 (right). The

spread between the average lending rate and the uncollateralised money market rate, i.e. the lending margin, reflects a credit risk premium for the institutions. The current market conditions entail

## Banks' average interest margin and deposit and lending rates

Chart 2.13



Note: The interest margin in the left-hand chart is based on several sources. Both interest margin and interest rates concern deposits and lending for households and the corporate sector.

Source: Danmarks Nationalbank and Kim Abildgren and Andreas Kuchler, Banks, credit and economic trends, Danmarks Nationalbank, *Monetary Review*, 2nd Quarter 2013, Part 2, and own calculations. In the left-hand chart, the most recent observation is from the 1st quarter of 2015. In the right-hand chart, the most recent observation is from April 2015.

<sup>16</sup> Households' balance sheet structures reflect the institutional framework, including the pension and mortgage credit systems, but also tax incentives to have large debt and financial wealth at the same time.

a risk of institutions failing to include a sufficiently high credit risk premium in their lending margins. In the longer term, the consequence of this could be a margin that is unable to cover the expected losses.

Danmarks Nationalbank's lending survey pointed to small increases in demand for loans from retail customers and new corporate customers over the last year. The survey also indicates that banks and mortgage banks expect demand to have risen slightly in the 2nd quarter of 2015. Hence, a potential for lending growth exists, but in previous upswings, the demand for loans typically did not rise until sometime after the upswing had set in. So it cannot be taken for granted that lending will rise notably in the near term.

The combination of a level of capitalisation that for many institutions exceeds the current capital requirements considerably, high excess liquidity cover, very low interest rates and limited demand for new loans creates the basis for fiercer competition for customers.

In March 2015, the Danish Financial Supervisory Authority published a survey of new corporate loans granted by selected banks. According to the survey, intensified competition among banks is reflected in lower lending rates for the best customers and to a lesser extent in easing of other terms and conditions such as collateral requirements. Danmarks Nationalbank's lending survey also points to a slight tendency for the banks to reduce interest rates on loans to corporate customers in response to competitor behaviour.

Competition may intensify further in the near future, and it is important that the banks do not lower their credit standards. If there are banks that do not have a viable business model in the current competitive situation, they should seek a market-based solution by e.g. merging or being acquired.

## LOW INTEREST RATES LEAD TO HIGHER RISKS IN THE HOUSING MARKET

### THE MORTGAGE BANKS SHOULD CONDUCT REALISTIC STRESS TESTING OF BORROWERS

Danish home owners have benefited from the low interest rates via low borrowing costs. At the

**Mortgage banks' average interest rates, including administration margins, on new lending to households, by fixed interest period**

Chart 2.14



Note: Interest rates for new lending in Danish kroner (nominal loans only). The most recent observation is from April 2015.

Source: Danmarks Nationalbank.

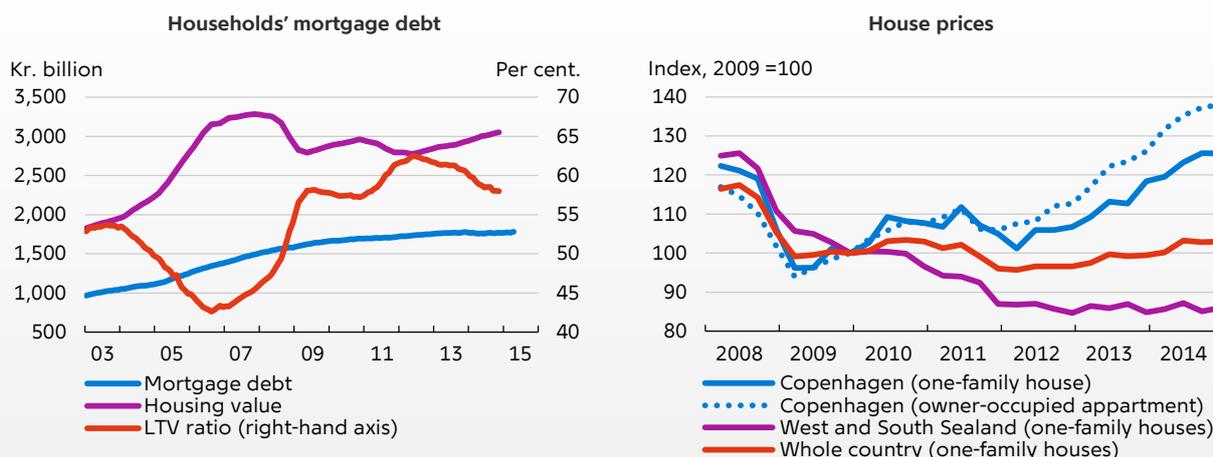
beginning of the year, mortgage bond yields fell below zero for bonds with a maturity of up to 3 years. Even though the mortgage banks have raised their administration margins, borrowing costs are still very low, cf. Chart 2.14.

Bond yields are a fundamental factor behind the development in the price of a home, since they reflect the financing costs of buying the home. Consequently, falling bond yields increase the demand for housing. If the housing supply is stable, higher demand leads to higher house prices. Prolonged price increases may become self-reinforcing over time, if households tend to base their current purchase prices on expectations of higher house prices in the future. This may create housing market bubbles.

According to the code of good practice, a mortgage bank should, before granting a variable rate mortgage loan, ensure that the borrower is able to service a 30-year fixed rate loan with amortisation. In the current environment, this means that a mortgage bank can grant a variable rate loan if only the borrower is able to service a loan with a fixed rate of 3 per cent. It is important that the mortgage banks, in their assessment of a borrower's finances, take into account that the variable rate may quickly exceed this level.

Households' mortgage debt relative to housing value and house prices in selected regions

Chart 2.15



Note: Mortgage debt is total lending by mortgage banks to households including sole proprietorships. LTV ratio is defined as total lending by mortgage banks to households as a percentage of housing value. The most recent observations for mortgage debt are from April 2015. The most recent observations for house prices are from the 4th quarter of 2014.

Source: Statistics Denmark and Danmarks Nationalbank.

**LARGE FLUCTUATIONS IN HOUSE PRICES WEAKEN MACROECONOMIC STABILITY**

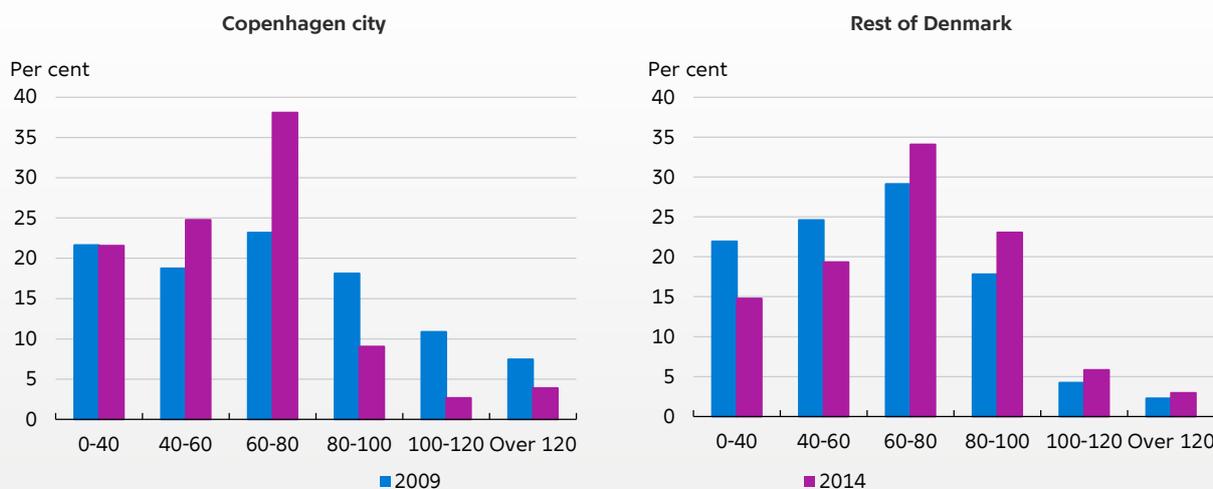
The households' average loan-to-value, LTV, ratio has fallen since mid-2012. This can be attributed to rising house prices, while households' total mortgage debt has risen over the same period, cf. Chart 2.15 (left). The large cities, especially Copenhagen, have accounted for the strongest

house price increases since 2009, while other areas have had falling house prices, cf. 2.15 (right).

In Copenhagen, rising house prices from 2009 to 2014 have reduced the share of home owners with an LTV ratio of more than 80 per cent, cf. Chart 2.16 (left), while the same tail in the LTV distribution for the rest of Denmark has increased, cf. Chart 2.16 (right). Rising house prices in Copenha-

Distribution of families' mortgage debt as a percentage of housing value, 2009 and 2014

Chart 2.16



Note: Only families with mortgage debt have been included in the chart. Debt is stated at year-end.  
Source: Own calculations based on data from Statistics Denmark and the mortgage banks.

gen increase home owners' opportunities to raise loans against the house as collateral. Alternatively, rising house prices reduce the need to repay the debt.

According to an analysis from Danmarks Nationalbank, households with high LTV ratios had higher consumption relative to income than other households in the years leading up to the financial crisis and reduced consumption more during the financial crisis. At the same time, the reduction in consumption at a given LTV ratio was most pronounced for households with the highest debt relative to income.

High LTV ratios can thus reinforce cyclical fluctuations in the Danish economy and thus have an indirect effect on financial stability.<sup>17</sup> In Danmarks Nationalbank's assessment, more subdued house price developments in the years leading up to the financial crisis would have resulted in a less pronounced fall in private consumption during the crisis. Against that backdrop, Danmarks Nationalbank has recommended that the link between property values and the property value tax be restored.<sup>18</sup>

#### LTV LIMIT FOR DEFERRED AMORTISATION SHOULD SUPPLEMENT THE SUPERVISORY DIAMOND FOR MORTGAGE BANKS

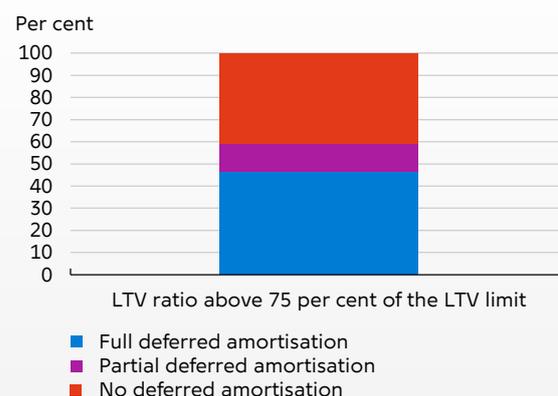
Deferred amortisation mortgage loans increase mortgage banks' credit risk, unless households use the deferred amortisation option for other consolidation purposes. Even small redemptions may influence mortgage banks' loss levels in the event of high LTV ratios. Since the collateral for housing loans from banks is often the property value beyond the LTV limit for the mortgage loan, deferred amortisation may also contribute to increasing the credit risk for banks.

One of the indicators of the Danish Financial Supervisory's Supervisory Diamond for mortgage banks aims to limit the proportion of deferred amortisation mortgage loans for properties with high LTV ratios. The indicator does not relate to a mortgage bank's individual loans, but to its overall portfolio. The mortgage bank chooses its

17 See Asger L. Andersen, Charlotte Duus and Thais L. Jensen, Household debt and consumption during the financial crisis, Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2014.

18 See Niels A. Dam, Tina S. Hvolbøl and Morten Hedegaard, A multi-speed housing market, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2014.

**Distribution of deferred amortisation for home owners with high LTV ratios, 2014** Chart 2.17



Note: Different LTV limits for holiday homes and owner-occupied homes. 75 per cent of the limit refers to an LTV ratio of 45 per cent for holiday homes and 60 per cent for owner-occupied homes. In the indicator, LTV ratios are calculated on the basis of the value of the home at the time of mortgaging, while all housing values in the chart are from 2014.

Source: Own calculations based on data from Statistics Denmark and the mortgage banks.

own portfolio composition with a view to complying with the indicator. The indicator will apply to mortgage banks by 2020.

The mortgage banks taken as one have granted full deferred amortisation for almost half of their loans to households with high LTV ratios, cf. Chart 2.17. Only few borrowers with high LTV ratios have been granted partial deferred amortisation. A simple example shows that, in principle, the mortgage banks would be able to distribute deferred amortisation among their retail customers in such a way that they comply with the indicator, and at the same time operate with deferred amortisation for almost 40 per cent of their loans to households with high LTV ratios, cf. Box 2.6.

Danmarks Nationalbank finds that the Supervisory Diamond is a good supervisory tool in relation to mortgage banks. However, it will still be possible for a considerable proportion of borrowers to be granted deferred amortisation right up to the LTV limit of 80 per cent. Hence, with a view to the security of the mortgage credit system Danmarks Nationalbank recommends that the Supervisory Diamond be supplemented by a lower deferred amortisation limit for the individual borrowers. The reduction should apply to deferred amortisation loans underlying covered

## Examples of compliance with the deferred amortisation indicator

Box 2.6

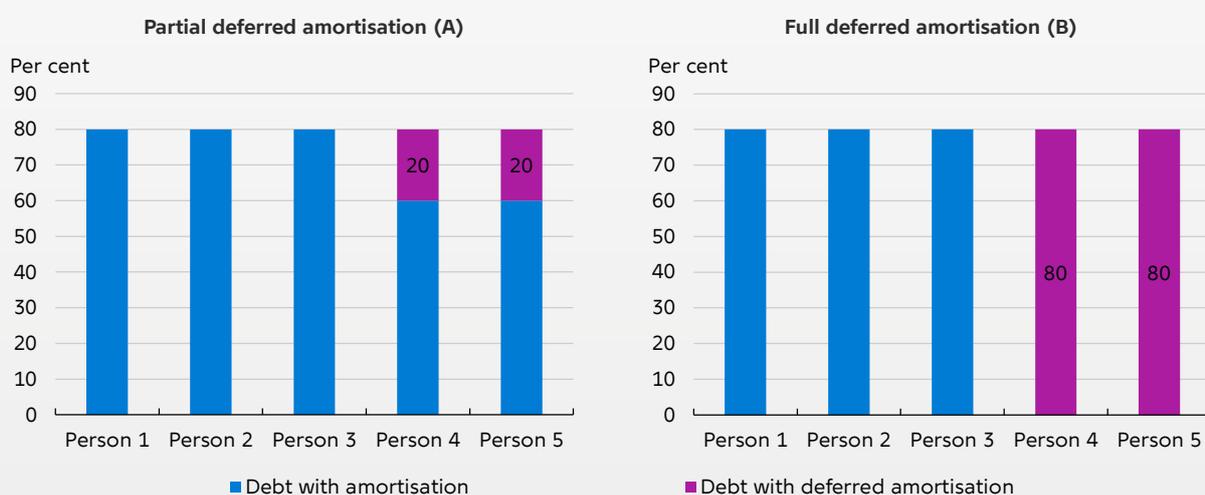
The indicator for deferred amortisation in the Supervisory Diamond for mortgage banks is to limit deferred amortisation on loans to households.

According to this indicator, the share of loans with deferred amortisation and LTV ratios above 75 per cent of the LTV limit may not exceed 10 per cent of total loans. At an LTV limit of 80 per cent, which is the current LTV limit for mortgage loans for owner-occupied homes, the share of deferred amortisation loans in the 60-80 per cent LTV band must not exceed 10 per cent of total loans. Deferred amortisation loans are included, irrespective of their ranking in relation to other mortgage loans.

A simple example is a mortgage bank with a portfolio of five borrowers. It is assumed that all five have mortgaged their homes up to the permitted LTV limit of 80 per cent, where deferred amortisation for loans in the 60-80 per cent

LTV band counts in the indicator. Since the mortgage banks overall have granted full deferred amortisation to almost half of their customers with high LTV ratios, it is assumed in the example that two out of five have full deferred amortisation, while the rest have no deferred amortisation. If two borrowers have full deferred amortisation for 20 per cent of the housing value, while the other three have no deferred amortisation, the indicator is only just observed, cf. Chart A. Since deferred amortisation loans are covered by the indicator irrespective of their ranking, the indicator is also only just observed with two borrowers with full deferred amortisation, cf. Chart B. Even though the indicator is observed in both cases, the total volume of deferred amortisation accounts for 10 per cent of total loans in the situation with partial deferred amortisation and 40 per cent in the situation with full deferred amortisation.

## Examples of compliance with the deferred amortisation indicator



Note: The charts show a loan portfolio of five borrowers, all with an LTV ratio of 80 per cent. The indicator for deferred amortisation is only just observed in both charts.

Source: Own calculations.

bonds, covered mortgage bonds or mortgage bonds issued by banks and mortgage banks.

### HOME OWNERS ARE INCREASINGLY OPTING FOR FIXED RATE MORTGAGE LOANS

Since 2004, households taken as one have opted for both variable rate loans and deferred amortisation loans rather than fixed rate loans with amortisation, cf. Chart 2.18 (left). Today, variable rate loans with deferred amortisation account for 42 per cent of mortgage lending to households.

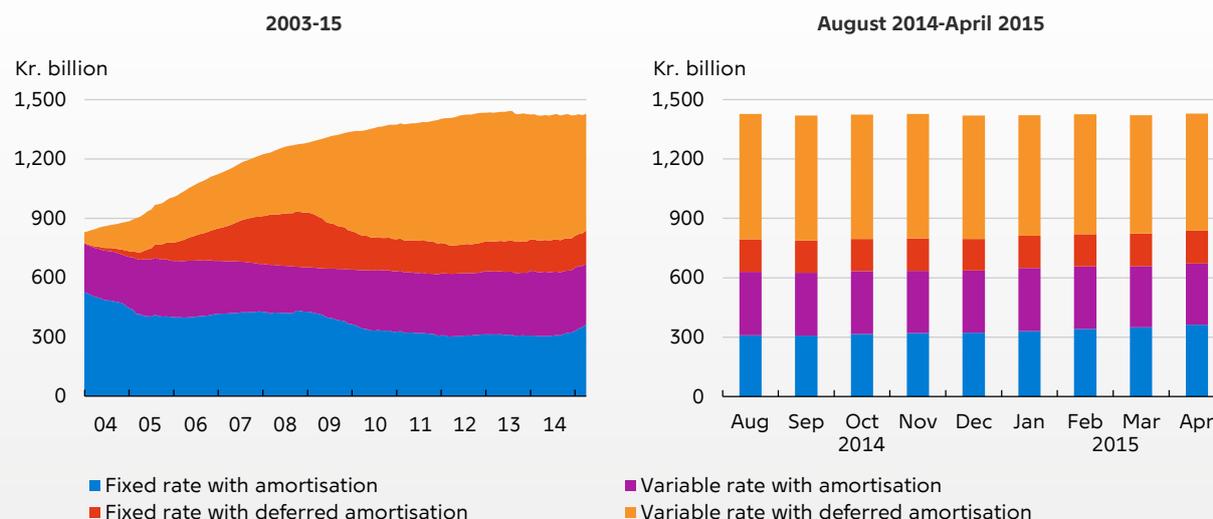
During 2014 and 2015 households have increasingly remortgaged in connection with the

declining interest rates. Until March 2015, households have remortgaged in favour of mortgage loans with longer maturities and fewer loans with deferred amortisation, cf. Chart 2.18 (right). There are indications of continued remortgaging activity up to the next settlement date in June 2015.

Compared with previously, fixed rate mortgage loans have become more attractive over variable rate mortgage loans. One reason is the increasing differentiation of administration margins, which ensures better coherence between price and risk on the various types of mortgage loans. At the same time, the interest spread between a long-

## Households' mortgage debt

Chart 2.18



Note: Total domestic lending by mortgage banks to owner-occupied homes and holiday homes.  
Source: Danmarks Nationalbank.

term loan and a short-term loan has declined since mid-2014.

## FIRMS' CAPITALISATION HAS GENERALLY IMPROVED, WHILE AGRICULTURE IS EXPERIENCING INCREASING LOSSES

### FIRMS' ENHANCED CAPITALISATION REDUCES CREDIT RISK

The solvency ratio of Danish firms has improved since 2006 due to higher level of equity, cf. Chart 2.19. In the years leading up to the financial crisis, the firms reduced their solvency by raising more debt. The risk of a firm defaulting on its debt commitments depends on its solvency and earnings volatility. For instance, a firm in an industry where substantial drops in earnings are frequently experienced should have a higher solvency, aiming at a buffer of sufficient size to be able to service its debt.

### Corporate debt to banks and mortgage banks

Corporate debt primarily consists of short-term and long-term loans mainly financed by banks and mortgage banks, cf. Chart 2.20. Loans and trade credits from other firms and loans from

foreign units also constitute significant funding sources for many firms. Moreover, the largest Danish firms can raise debt directly in the financial markets by issuing corporate bonds.

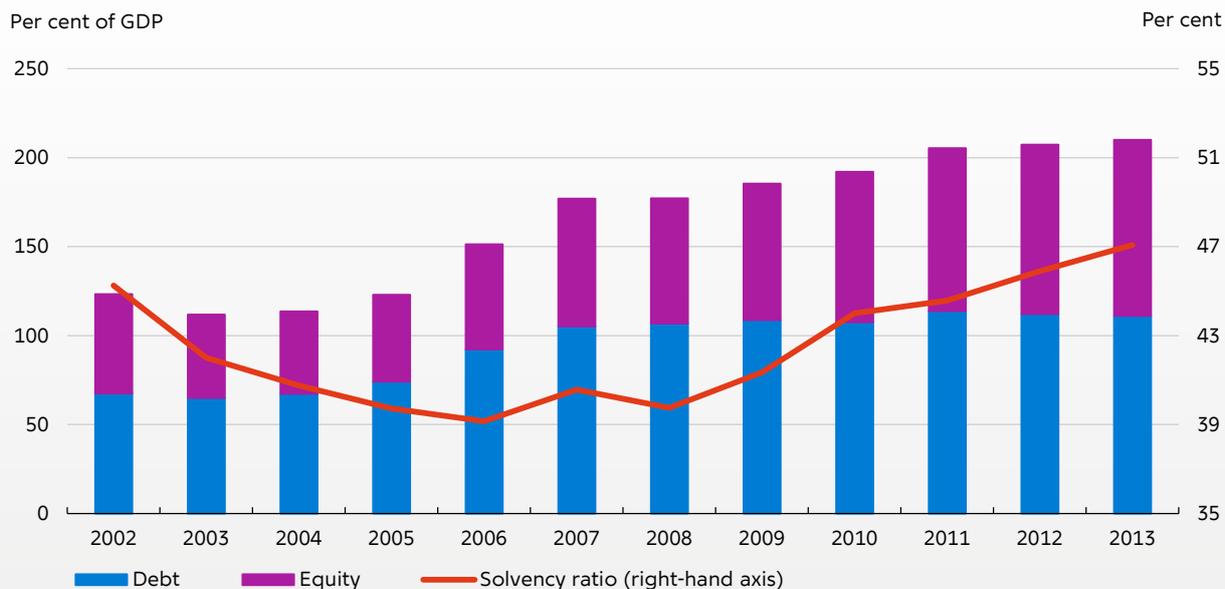
In recent years, insurance companies and pension funds and their investment funds have shown growing interest in lending directly to small and medium-sized enterprises. Given the current low level of interest rates, insurance companies and pension funds can obtain a higher return by lending directly to firms than by investing in e.g. the bond market. The higher return reflects the insurance companies' and pension funds' larger credit risk exposure on direct lending to small and medium-sized enterprises. So far, corporate debt to insurance companies and pension funds accounts for a small share of the firms' total debt, but in the longer term the development may lead to intensified competition on lending to corporate customers.

### High-solvency firms account for the largest share of debt

On average, the largest firms have the highest solvency, as a larger proportion of their funding comes from equity than from debt, while the smallest firms have the lowest solvency, cf. Chart 2.21 (left). Large firms with high solvency have raised more than two-thirds of total corporate debt.

**Firms' capital structure and solvency ratio**

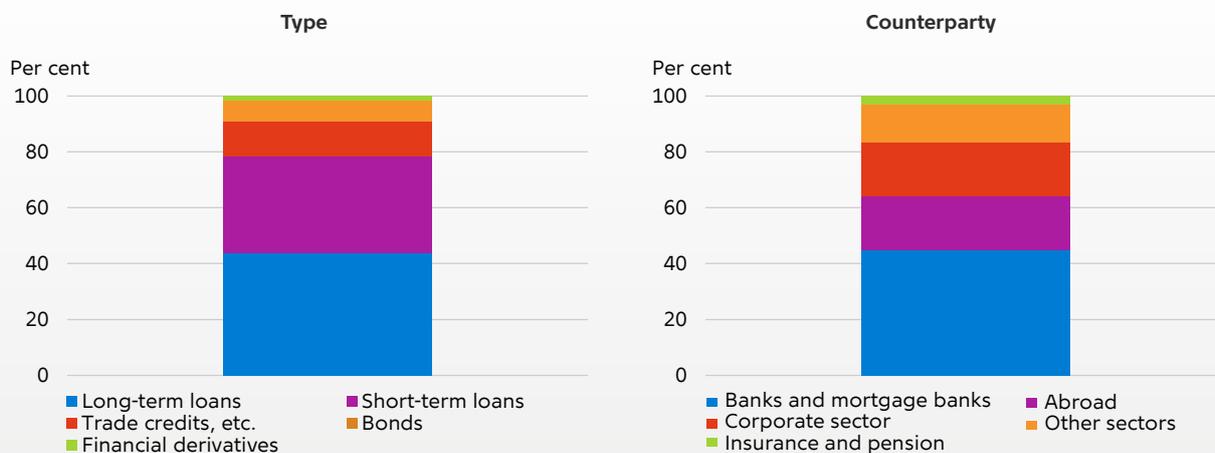
Chart 2.19



Note: In the chart, firms are firms in the industries building and construction, real property, etc., manufacturing, etc., trading, etc., transport, etc., other and industry not stated. Agriculture is not included in the chart. Debt has been calculated as firms' total liabilities less equity. Solvency ratio is total equity as a percentage of total assets.  
 Source: Own calculations based on data from Experian.

**Firms' total debt, end-2014**

Chart 2.20



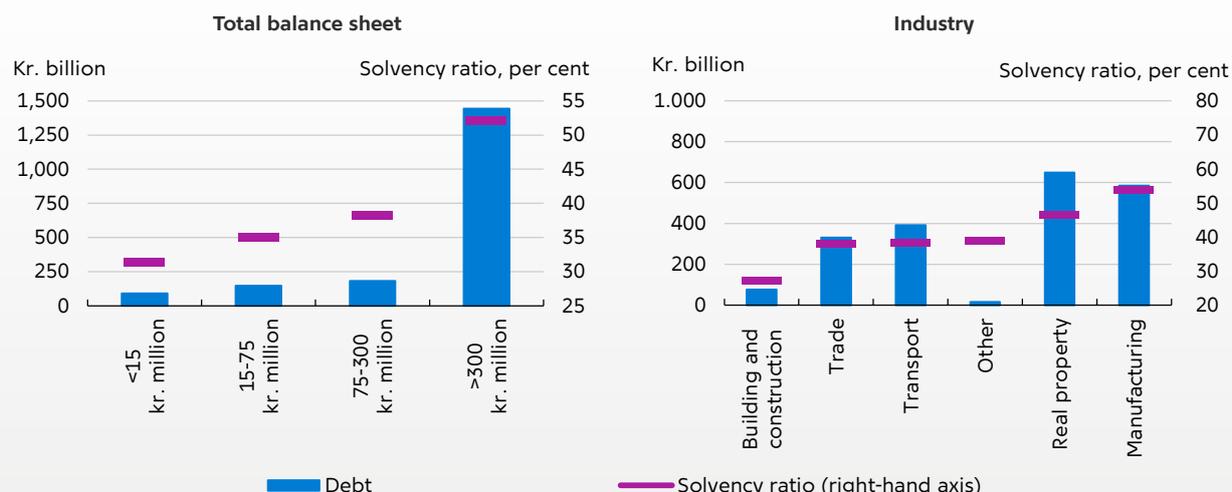
Note: The charts show the debt of non-financial corporations. There is minor divergence between the population of non-financial corporations in Quarterly financial accounts and firms in Experian data.  
 Source: Danmarks Nationalbank.

Building and construction has the lowest average solvency, cf. Chart 2.21 (right), and some parts of this industry are also exposed to price fluctuations in the real estate market. Indeed, the banks' loan impairment charge ratios since the financial

crisis reflect that firms in building and construction and the real estate industry are relatively more risky than firms in other industries. A large share of total debt has been raised by firms in industries with high average solvency.

Firms' total debt and average solvency, end-2013

Chart 2.21



Note: Debt has been calculated as firms' total liabilities less equity. Solvency has been calculated as equity as a ratio of total assets. Agriculture is not included in the chart.  
 Source: Own calculations based on data from Experian.

The number of defaults among Danish firms decreased from 2010, but since mid-2014 it has again increased somewhat.

An increase in interest rates from the current low level should be expected to entail a larger share of corporate customers struggling to service their debt obligations. Particularly firms with low solvency may come under pressure in the event of falling earnings and rising funding costs. This emphasises the importance of credit institutions thoroughly assessing the credit quality of their corporate customers.

### NON-SYSTEMIC BANKS HAVE SUBSTANTIAL LOAN IMPAIRMENT CHARGES ON AGRICULTURE

The average solvency of farms declined considerably from 2008 to 2014, and low-solvency farms accounted for a large share of debt to banks and mortgage banks and other creditors in 2014, cf. Chart 2.22 (left). Many of these low-solvency farms also had operating losses.<sup>19</sup> In general, for farms with low solvency and losses, a smaller share of the debt is funded via mortgage banks. All else equal, this is good news for the mortgage banks' risk of losses.

Due to falling food prices in the international markets in 2014, a part of the industry has been unable to service their debt despite the very low interest rates. However, over the past 10 years, agricultural sales prices have fluctuated several times by a rate equivalent to the decline in 2014 and, in a longer perspective, the current price levels are not abnormal. In view of previous fluctuations in earnings, farms should increase their solvency to build up a buffer of sufficient size to cushion future low sales prices.

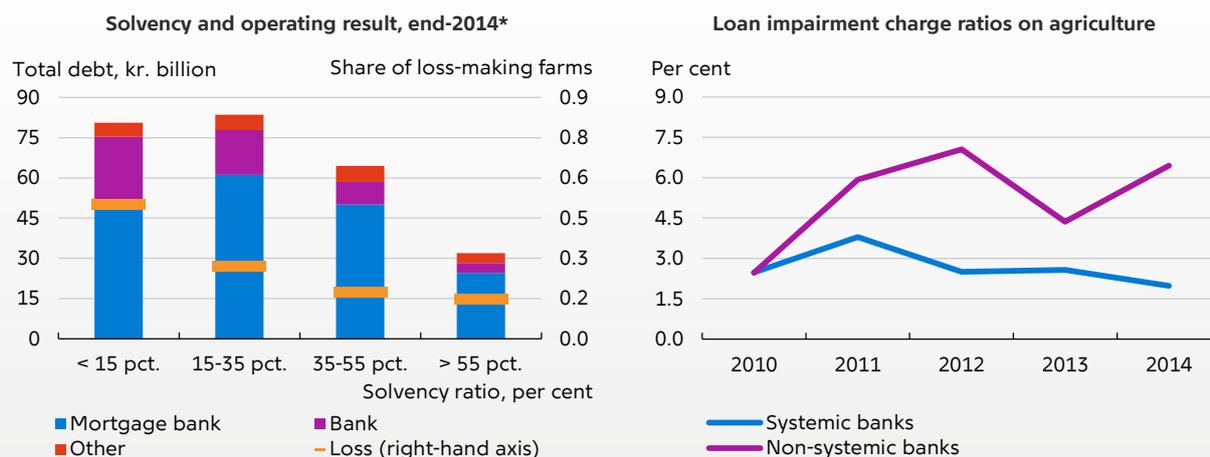
The non-systemic banks' loan impairment charges on agriculture were higher in 2014 than in 2013, while the loan impairment charge ratio for agricultural customers declined a little for the systemic groups, cf. Chart 2.22 (right). At the same time, agricultural loans account for a larger share of total lending for the non-systemic banks than for the systemic groups. Loan impairment charge ratios vary strongly among the non-systemic banks.

In May 2015 the Danish government reached agreement with the agricultural sector and the bank and mortgage bank sector about a joint effort to strengthen developments in agriculture.

19 An analysis of agriculture is contained in Erik Haller Pedersen, Birgitte Vølund Buchholst and Peter Askær Drejer, Danish agriculture, Danmarks Nationalbank, *Monetary Review*, 2nd Quarter 2014.

## Debt and loan impairment charges for agriculture

Chart 2.22



Note: The right-hand chart shows all full-time farms. The estimation of data for 2014 takes as its point of departure the sample of farm financial statements on which Statistic Denmark's latest accounts statistics for agriculture are based.  
 Source: Danish Financial Supervisory Authority and own calculations based on data from Statistics Denmark (individual data).

The objective is to reduce agricultural debt and inject capital into efficient farms while closing down or instigating change of ownership of farms unable to achieve sufficient progress in efficiency. A new investment fund, Dansk LandbrugsKapital, will be established with capital amounting to at least kr. 2 billion with the purpose of funding Danish agriculture.



# 3

## STRESS TEST OF THE BANKS' CAPITALISATION

### ASSESSMENT

Danmarks Nationalbank's stress test shows that the systemic banks are robust. The five systemic banks have considerable excess capital adequacy in relation to the minimum requirements in all of the stress test scenarios.

Previously, the banks' individual excess capital adequacy in addition to the minimum requirements and the individual Pillar II add-on requirement was unregulated. Until 2019, the excess capital adequacy will be partly regulated through capital buffer requirements<sup>1</sup>. This may help to ensure that banks will meet the minimum capitalisation requirements, also in downturn periods. The buffer requirements also enable early intervention by the Danish Financial Supervisory Authority. Banks that currently only just comply with the fully phased-in buffer requirements can be expected to gradually increase their capitalisation over the coming years to provide some scope for meeting the buffer requirements.

Danmarks Nationalbank's stress test shows Danish banks' excess capital adequacy – not just in relation to the minimum requirements, but also in relation to the capital buffer requirements. In the most severe stress test scenario, in 2017 some systemic banks will have a small capital shortfall, in relation to the capital buffer requirements, of about kr. 1 billion, or 0.1 per cent of the total risk-weighted exposures of the stress test pop-

ulation. The capital buffer requirements were introduced to enable the banks' capital buffers to absorb losses in the event of severe economic shocks. Given that the capital shortfall of systemic banks arises in the most severe scenario and since they still have considerable excess capital adequacy in relation to the minimum requirements, Danmarks Nationalbank assesses that the capital shortfall of systemic banks in relation to the capital buffer requirements in the most severe scenario will not pose any threat to financial stability. However, the systemic banks should prepare for the situation that market standards outside the banking union could be tougher than the regulatory capital buffer requirements.

In the most severe stress test scenario, some non-systemic banks will have a capital shortfall by the equivalent of about 0.3 per cent of the total risk-weighted exposures of the stress test population to comply with the minimum requirements. In Danmarks Nationalbank's assessment, the size of the capital shortfall and its distribution among non-systemic individual banks will not pose any threat to financial stability either.

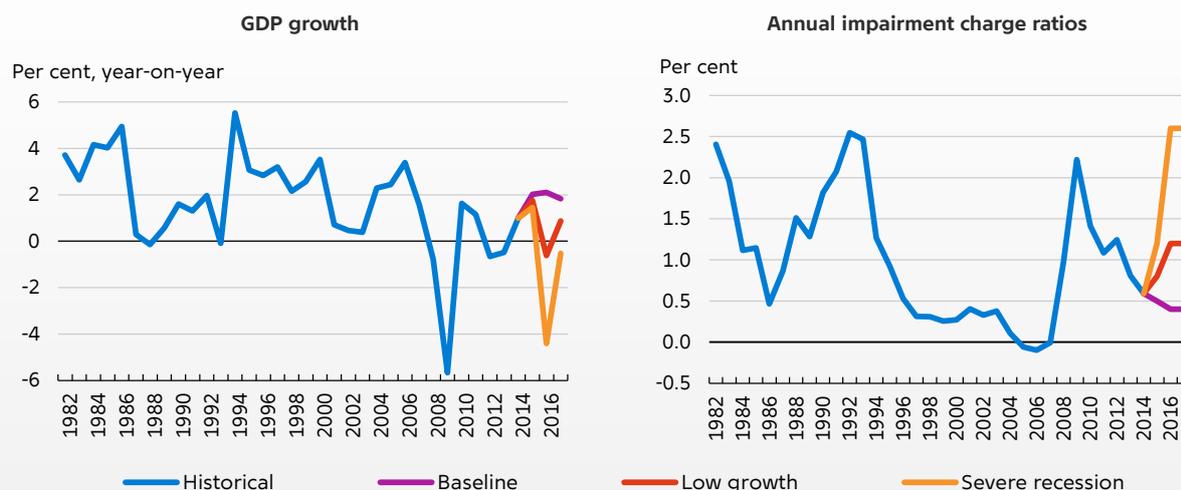
Banks have various options to mitigate a capital shortfall, for instance raising capital in the market, reducing risk or balance sheets or improving cost efficiency. Subsidiary banks in financial groups also have the option of obtaining a capital injection from the parent company. For some banks, a merger could also be a solution.

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<sup>1</sup> The capital buffer requirements of Danmarks Nationalbank's stress test comprise the capital conservation buffer and the SIFI capital buffer.

GDP growth and annual impairment charge ratios

Chart 3.1



Note: In the right-hand chart, loan impairment charges are calculated as a ratio of lending and guarantees before loan impairment charges. The historical series until 2014 is based on banks in the Danish Financial Supervisory Authority's groups 1-3. The estimated loan impairment charge ratios for 2015-17 are 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.

## RESULTS

Based on Danmarks Nationalbank's stress test model, Danmarks Nationalbank assesses the capitalisation of Danish banks in various macroeconomic scenarios. The stress test includes five systemic and 11 non-systemic banks, which accounted for 85 and 9 per cent, respectively, of Danish banks' lending and guarantees at end-2014.<sup>2</sup> The analysis is based on the banks' financial statements for 2014. The banks' profit and loss accounts and balance sheets are projected up to and including the 4th quarter of 2017, making the stress test period three years. The projection is performed in three scenarios (baseline scenario, low growth and severe recession), cf. Chart 3.1 (left). The baseline scenario is based on Danmarks Nationalbank's macroeconomic projection, cf. *Monetary Review*, 1st Quarter 2015. But as the model is based on a number of careful assumptions in the projection, the baseline scenario does

not represent a projection of banks' capitalisation. In the severe recession scenario, the banks' loan impairment charges will increase significantly, cf. Chart 3.1 (right).

The structure, assumptions and macroeconomic scenarios of the stress test model are detailed in the technical appendix to this chapter.

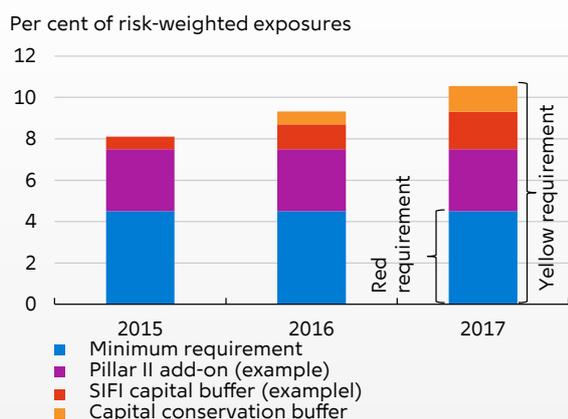
### CAPITALISATION

In the stress test, the banks' capital in the projection period is tested against two capital requirements, a red requirement and a yellow requirement. The red requirement is the minimum requirements under CRD IV/CRR.<sup>3</sup> The yellow requirement is the total capital requirement, i.e. the red requirement plus the Pillar II add-on requirement and the capital buffer requirements, cf. Chart 3.2. Non-compliance with the red requirement will prompt the Danish Financial Supervisory

<sup>2</sup> The population is the Danish Financial Supervisory Authority's groups 1 and 2, excluding Saxo Bank and FIH Erhvervsbank, cf. Appendix 1 (Table B1.1).

<sup>3</sup> The minimum Common Equity Tier 1 risk-based capital ratio is 4.5 per cent. The minimum Tier 1 risk-based capital ratio is 6 per cent and the minimum total risk-based capital ratio is 8 per cent. 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 it is fully loss-absorbing.

**Illustration of the Common Equity Tier 1 capital requirements in the stress test** Chart 3.2



Note: The red requirement is the minimum requirements under CRD IV/CRR. Common Equity Tier 1 capital must account for at least 4.5 per cent. In addition to Common Equity Tier 1 capital, the red requirement includes minimum levels for Tier 1 capital and total capital of 6 and 8 per cent, respectively. The yellow requirement is the red requirement plus the Pillar II add-on requirement, which has been set at 3 per cent for illustration purposes, the SIFI capital buffer, which has been set at the upper limit of the buffer for each of the years in question for illustration purposes, and the capital conservation buffer.

Authority to revoke the banking licence unless the bank recapitalises within a fixed short deadline. Non-compliance with the yellow requirement means that Danish Financial Supervisory Authority

may impose restrictions on dividend payments or orders in terms of other initiatives that will increase gradually with the size of the capital shortfall. The two capital requirements are described in more detail in the technical appendix to this chapter.

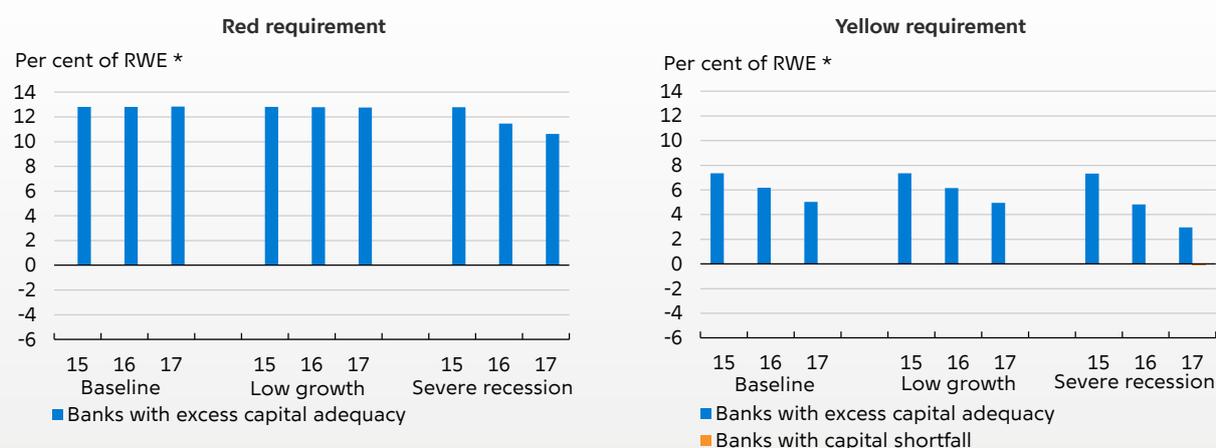
In the event of banks' non-compliance with one of the requirements, the individual bank's Common Equity Tier 1 capital shortfall relative to the requirement is calculated. The capital shortfall can be interpreted as the capital injection the bank in question needs in the stress test period to ensure compliance with the given requirement. For banks with more Common Equity Tier 1 capital than is needed for compliance with one of the requirements, the excess capital adequacy relative to the requirement is also calculated.

### Systemic banks

In all the stress test scenarios, the five systemic banks have considerable excess capital adequacy in relation to the red requirement, cf. Chart 3.3 (left). Relative to the yellow requirement, the banks' excess capital adequacy declines towards 2017 – also in the baseline scenario. In the baseline scenario, the decline is due solely to the phasing-in of the capital conservation buffer and the SIFI capital buffer towards 2019. In the severe recession scenario, some systemic banks will have a capital shortfall of about kr. 1 billion relative

**Excess capital adequacy or shortfall of systemic banks**

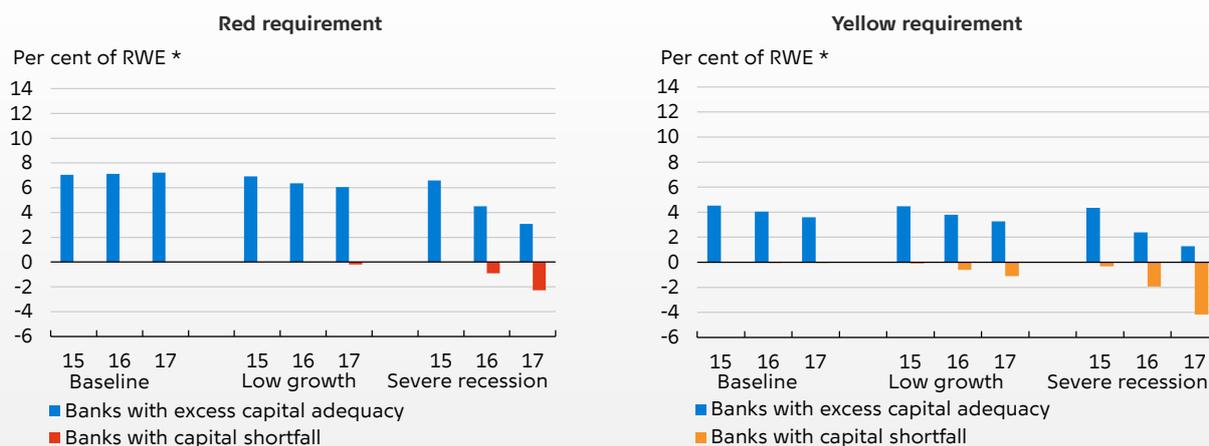
Chart 3.3



Note: \* The total risk-weighted exposures, RWE, of systemic banks.  
Source: Danish Financial Supervisory Authority and own calculations.

Excess capital adequacy or shortfall of non-systemic banks

Chart 3.4



Note: \* The total risk-weighted exposures, RWE, of non-systemic banks.  
Source: Danish Financial Supervisory Authority and own calculations.

to the yellow requirement in 2017, equivalent to approximately 0.1 per cent of the systemic banks' total risk-weighted exposures, cf. Chart 3.3 (right).

### Non-systemic banks

In the baseline scenario, all non-systemic banks will have excess capital adequacy relative to the red requirement. In the low growth scenario, they will experience a modest capital shortfall in 2017, cf. Chart 3.4. In the severe recession scenario, some non-systemic banks will have a total capital shortfall of around kr. 4 billion in 2017. That is equivalent to approximately 2 per cent of the total risk-weighted exposures of the non-systemic banks – or approximately 0.3 per cent of the total risk-weighted exposures of the stress test population. Relative to the yellow requirement, the capital shortfall will be kr. 8 billion in the severe recession scenario. This reflects the current low excess capital adequacy of several non-systemic banks.

### Sensitivity of the stress test model to negative interest rates

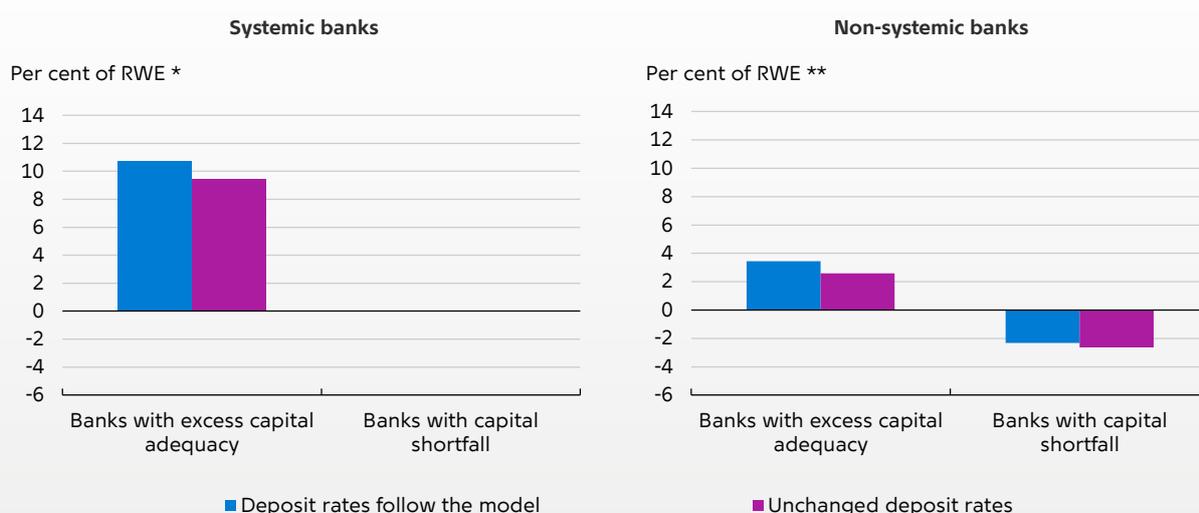
Danmarks Nationalbank's stress test model projects the banks' earnings based on modelled relationships between historical interest income and interest expenses and macroeconomic variables, mainly interest rate developments, cf. the technical appendix to this chapter. With the prevalence

of negative interest rates, bank earnings may be impacted by factors that are not reflected in the estimated relationship between earnings and interest rates. Since banks are hesitant to introduce negative deposit rates, deposit funding can be particularly sticky when it comes to the adjustment to negative interest rates. This may cause interest rates on bank deposits to be higher than the modelled rates, thereby increasing banks' interest expenses and reducing earnings.

To examine the sensitivity of the stress test results to this stickiness, a sensitivity analysis is performed in which banks' current deposit rates are maintained in the projection period and are thus not affected by the decline in interest rates in early 2015. With this analysis, the deposit rate will be about 0.5 percentage point higher than projected by the model. Lower earnings caused by higher interest expenses will erode banks' Common Equity Tier 1 capital. However, in the severe recession scenario, systemic banks will still have considerable excess capital adequacy in 2017 in relation to the minimum requirements, the red requirement, cf. Chart 3.5 (left). For non-systemic banks, the capital shortfall increases marginally by 0.3 percentage point to 2.6 per cent of their total risk-weighted exposures in the severe recession scenario, cf. Chart 3.5 (right). Thus, the result of the sensitivity analysis does not change Danmarks Nationalbank's assessment of the robustness of

**Excess capital adequacy or shortfall of banks relative to the red requirement at modelled and unchanged deposits rates, respectively**

Figur 3.5



Note: The chart shows excess capital adequacy or shortfall in the most severe scenario in 2017. \* The total risk-weighted exposures, RWE, of the systemic banks. \*\* The total risk-weighted exposures, RWE, of the non-systemic banks.  
 Source: Danish Financial Supervisory Authority and own calculations.

banks. Moreover, banks have various options when it comes to mitigating the effect of negative interest rates, cf. Chapter 4. These effects are not included in the sensitivity analysis.

## TECHNICAL APPENDIX: DANMARKS NATIONALBANK'S STRESS TEST

The stress test simulates the development in the banks' capitalisation in various macroeconomic scenarios. The banks' profit and loss accounts and balance sheets are projected using a number of satellite models. The models consist of relations between macroeconomic developments on the one hand and bank earnings and loan impairment charges on the other. The stress test is based on a number of assumptions and delimitations. For instance, the banks' liquidity risks or direct influence on each other are not taken into account. The stress test also assumes that there is no scope for management intervention in the form of cutbacks or extraordinary reductions of the business volume. The results of the stress test are included in a more broad-based assessment of the development in the banks' capital and risks.

### SATELLITE MODELS

The stress test model is based on a number of satellite models. The following section describes the various satellite models and the underlying assumptions.

#### Core earnings

Core earnings are banks' earnings before impairment charges. The model projects the key interest-bearing income and expense items and the largest other income and expense items. Relations between historical interest income and interest expenses and macroeconomic variables, mainly interest rate developments, have been estimated. Moreover, bank-specific additions have been estimated, reflecting the banks' different business models, including credit quality of loans, maturities, collateral, etc.

The sum of the individual items provides overall estimated core earnings for each quarter of the projection period.

#### Loan impairment charges

The banks' loan impairment charges on lending and guarantees are modelled by estimating relationships between the historical loan impairment charges for households and six corporate sectors

on the one hand and a number of macroeconomic variables on the other (macro factor model). The results of the loan impairment charge models are compared with results of models of the relationship between accounts-based estimated failure rates and the loan impairment charges in the sectors.

The projection of banks' loan impairment charges is described in Danmarks Nationalbank's *Monetary Review* 2012, 1st Quarter, Part 2.

### Balance sheets and capitalisation

The banks' balance sheets and capital are projected once every quarter based on the following assumptions:

- The bank's average risk weight is assumed to be constant over the entire projection period.
- A tax rate of 25 per cent and a dividend share of 25 per cent of profit after tax are assumed for all the banks.
- A threshold value is defined for the banks' Common Equity Tier 1 capital as a percentage of risk-weighted exposures (CET1 percentage). The threshold is the bank's yellow requirement plus 1 percentage point. The projection of the bank's balance sheet depends on its level relative to this threshold value and whether it generates a profit or loss after tax and dividend:
  - *In the event of a profit and if the CET1 percentage is above the threshold in the preceding quarter, profit after tax and dividend is transferred to equity. Total assets rise proportionally with equity, leaving the bank's capitalisation unchanged. In other words, the bank uses the profit to increase its business volume.*
  - *In the event of a profit and if the CET1 percentage is below the threshold in the preceding quarter, profit after tax and dividend is transferred to equity. Total assets remain unchanged, thus improving the bank's capitalisation. In other words, the bank uses the profit to strengthen its capitalisation.*
  - *In the event of a loss, the loss after tax and dividend is transferred to equity. Total assets are also reduced by the loss after tax and dividend, i.e. the bank's loss reduces the capital relatively more than the business volume, leading to a decline in the bank's capitalisation.*

### Stress scenarios

Box 3.1

#### *Low growth*

The scenario implies low economic activity. The development in private consumption, private investment and house prices is less favourable than in the baseline scenario.

#### *Severe recession*

The scenario implies a strong global shock to business and consumer confidence. Export market growth is reduced relative to the baseline scenario. The Danish economy is affected by an erosion of business and consumer confidence, leading to negative shocks to private consumption, private investment and house prices.

### SCENARIOS

The capitalisation of banks is assessed in three scenarios. The baseline scenario is based on Danmarks Nationalbank's macroeconomic projection, cf. *Monetary Review*, 1st Quarter 2015. As the model is based on a number of conservative assumptions in the projection, cf. above, the scenario does not represent a projection of banks' capitalisation.

The other two scenarios imply negative shocks to the economy, representing a low growth scenario and a severe recession scenario, respectively, cf. Box 3.1. The negative shocks to the economy will occur only towards the end of 2015.

Table 3.2 shows selected key variables for the three scenarios, which have been prepared in cooperation with the Danish Financial Supervisory Authority.

### CAPITAL REQUIREMENTS

The rules of CRD IV/CRR set out the minimum requirements for banks' capitalisation. The rules entail that

- Common Equity Tier 1 capital must be at least 4.5 per cent of risk-weighted exposures.
- Tier 1 capital must account for at least 6 per cent of risk-weighted exposures.
- Total capital must account for at least 8 per cent of risk-weighted exposures.

Non-compliance with one of the three minimum requirements will prompt the Danish Financial Supervisory Authority to revoke the banking licence unless the bank recapitalises within a fixed short deadline.

**Scenarios, selected key variables**

Table 3.2

	2015	2016	2017
<b>Baseline scenario</b>			
GDP, per cent year-on-year	2.0	2.1	1.8
Private consumption, per cent year-on-year	2.2	2.2	2.1
Export market growth, per cent year-on-year	4.6	5.2	4.9
Unemployment rate, per cent	3.4	3.1	2.9
House prices, per cent year-on-year	3.4	3.3	3.5
<b>Low growth</b>			
GDP, per cent year-on-year	1.8	-0.6	0.9
<i>-, deviation from baseline scenario, percentage points</i>	-0.2	-2.7	-0.9
Private consumption, per cent year-on-year	1.9	-1.9	-0.2
<i>-, deviation from baseline scenario, percentage points</i>	-0.3	-4.1	-2.3
Export market growth, per cent year-on-year	4.6	5.2	4.9
<i>-, deviation from baseline scenario, percentage points</i>	0.0	0.0	0.0
Unemployment rate, per cent	3.5	3.9	4.5
<i>-, deviation from baseline scenario, percentage points</i>	0.1	0.8	1.6
House prices, per cent year-on-year	2.9	-5.1	-2.7
<i>-, deviation from baseline scenario, percentage points</i>	-0.5	-8.4	-6.2
<b>Severe recession</b>			
GDP, per cent year-on-year	1.5	-4.4	-0.5
<i>-, deviation from baseline scenario, percentage points</i>	-0.5	-6.5	-2.3
Private consumption, per cent year-on-year	1.8	-3.8	-1.0
<i>-, deviation from baseline scenario, percentage points</i>	-0.4	-6.0	-3.1
Export market growth, per cent year-on-year	3.0	-8.6	3.6
<i>-, deviation from baseline scenario, percentage points</i>	-1.6	-13.8	-1.3
Unemployment rate, per cent	3.5	5.2	7.5
<i>-, deviation from baseline scenario, percentage points</i>	0.1	2.1	4.6
House prices, per cent year-on-year	2.4	-11.7	-5.3
<i>-, deviation from baseline scenario, percentage points</i>	-1.0	-15.0	-8.8

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

Danish banks must meet the Pillar II add-on requirement using Common Equity Tier 1 capital

or other capital with loss-absorbing properties.<sup>4</sup> In addition, more buffer requirements have been

<sup>4</sup> Cf. the Danish Financial Supervisory Authority's guide to section 124(5) of the Danish Financial Business Act – Capital requirements for meeting the Pillar II add-on under the 8+ method.

## Capital requirements in the stress test

Box 3.2

In the stress test, banks' Common Equity Tier I capital<sup>1</sup> is assessed in relation to two requirements, i.e. a red and a yellow requirement, cf. the table below. The red requirement

is the minimum requirements under CRD IV/CRR. The yellow requirement is the red requirement plus the Pillar II add-on requirement and the capital buffer requirements.

Red requirement	Yellow requirement
<ul style="list-style-type: none"><li>• Common Equity Tier 1 capital must account for at least 4.5 per cent.</li><li>• Tier 1 capital must account for at least 6 per cent.</li><li>• Total capital must be at least 8 per cent.</li></ul>	<ul style="list-style-type: none"><li>• The Pillar II add-on requirement must be met using Common Equity Tier I capital and is assumed to be constant over the period.</li><li>• Phasing-in of the SIFI capital buffer will commence in 2015. The SIFI capital buffer must be met by means of Common Equity Tier 1 capital and be between 0.2 and 0.6 per cent in 2015, between 0.4 and 1.2 per cent in 2016 and between 0.6 and 1.8 per cent in 2017 for systemic banks.</li><li>• In 2016, the phasing-in of the capital conservation buffer will commence. It is to be met using Common Equity Tier 1 capital. The requirement is 0.625 per cent in 2016 and 1.25 per cent in 2017.</li></ul>

1. Banks will be able to use Additional Tier 1 capital and Tier 2 capital held at end-2014 to meet the minimum requirements for Common Equity Tier 1 capital and total capital in the projection.

introduced, which are also to be covered by Common Equity Tier 1 capital.<sup>5</sup>

In the event of non-compliance with the Pillar II add-on requirement or a buffer requirement, the Danish Financial Supervisory Authority may impose transaction restrictions and initiate several supervisory processes.

The stress test defines a red and a yellow capital requirement, described in more detail in Box 3.2.

5 Cf. *Financial stability*, 2nd half 2013, Appendix 3.

# 4

## NEGATIVE INTEREST RATES AND THEIR IMPACT ON CREDIT INSTITUTIONS' EARNINGS

### INTRODUCTION AND SUMMARY

In the first months of 2015, negative market rates reached an extent and a level not previously seen in Denmark. There is little experience to show how negative interest rates affect credit institutions. The current evidence suggest that at the present level they affect the earnings and risk appetite of credit institutions in more or less the same way as marginally positive interest rates. However, negative interest rates may strengthen some of the risk factors associated with a sustained low level of interest rates and expectations of a continued low level, such as increased risk appetite among e.g. credit institutions and borrowers.

In recent years, bank earnings have been under pressure due to limited demand for new loans and low interest rates. Negative interest rates could add to this pressure if the banks are unable to reduce funding costs in step with the falling interest rates on assets.

The banks are adapting to a situation with negative interest rates. In the first months of 2015, deposit rates fell considerably, and negative deposit rates became more common. However, deposit rates are adjusted with a certain lag, and it is still only a small share of total deposits that earn interest at a negative rate. For banks with a high share of deposit funding, pressure on earnings from negative interest rates will, other things being equal, be greater.

The banks' income from fees has been rising in recent years and has made up for the decline in net interest income. When interest rates fall, banks

can also be assumed to adjust their return on equity, ROE, targets downwards.

The fall in interest rates in early 2015 also led to rising earnings for credit institutions in the form of e.g. more remortgaging and income from sale of forward exchange contracts to domestic and foreign investors.

The increased occurrence of negative interest rates raised a number of technical and legal questions, particularly in relation to taxation and issuance of mortgage bonds with negative yields. Most of these issues have been clarified by now, and the impact of negative interest rates on mortgage banks is assessed to be limited.

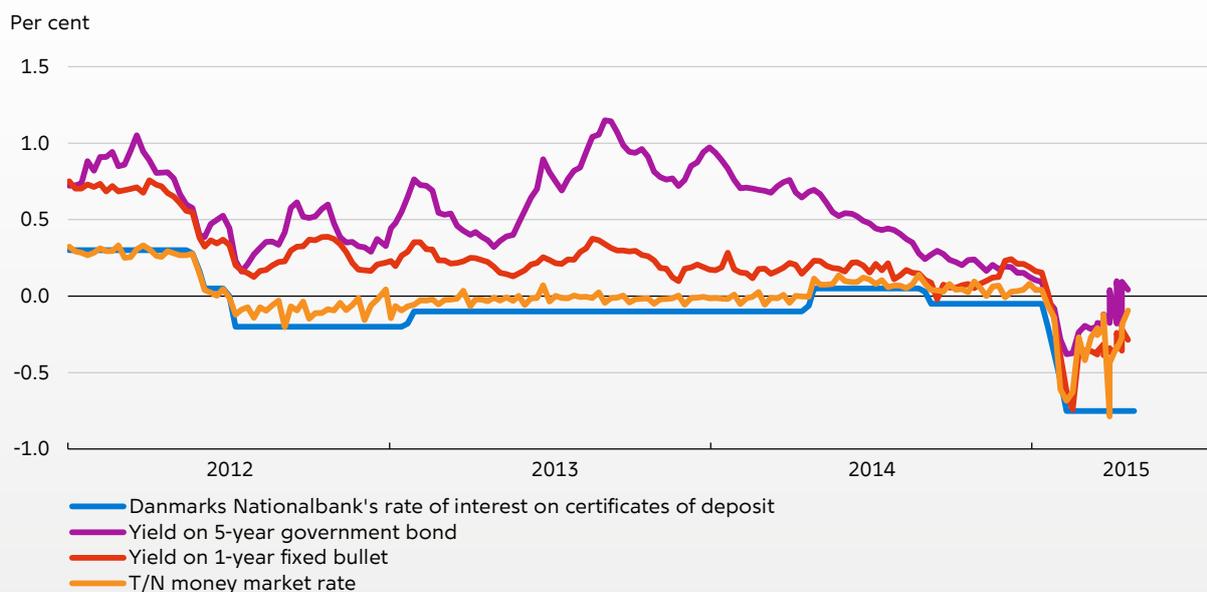
### INCREASED OCCURRENCE OF NEGATIVE INTEREST RATES

In January and February 2015, a tendency for the krone to strengthen against the euro led Danmarks Nationalbank to reduce the rate of interest on certificates of deposit on four occasions in order to keep the exchange rate stable. Since 6 February, the rate of interest on certificates of deposit has been -0.75 per cent. These interest rate reductions, combined with suspension of sales of government bonds and falling interest rates in Europe, led to negative market rates, also for longer maturities, cf. Chart 4.1.

In 2012-14, the rate of interest on certificates of deposit and short-term money market interest rates were also negative at times. But this time

Interest rate developments for selected maturities

Chart 4.1



Note: Weekly averages. The 5-year government bond yield is a 5-year zero coupon yield. The most recent observations are from the week that began on 25 May 2015.  
Source: Danmarks Nationalbank and RIO.

around the increased occurrence of negative interest rates across maturities and instruments is far greater than previously.

There is little historical experience with negative rates of interest. However, several central banks in Europe – including the ECB, Sveriges Riksbank and the Schweizerische Nationalbank, SNB – have recently introduced negative monetary policy interest rates to varying degrees. The ECB's deposit rate was -0.2 per cent at end-May 2015, while the Riksbank's repo rate was -0.25 per cent. In early 2015, the SNB lowered its deposit rate to -0.75 per cent.

Negative interest rates were previously regarded as a curiosity that was scarcely likely to function in practice on a large scale. This is because they can, in principle, be circumvented by holding cash, which always offers a nominal return of zero. The reason why interest rates can, nonetheless, be negative is that holding large cash amounts entails substantial costs, including costs for secure

storage and transport. Furthermore it is cumbersome to use cash for transactions involving large amounts or over geographical distances.<sup>1</sup>

## RISK APPETITE INCREASES IF INTEREST RATES REMAIN LOW

The current evidence suggest that at the present level negative interest rates affect the earnings and risk appetite of credit institutions in more or less the same way as marginally positive interest rates. However, negative interest rates may strengthen some of the risk factors linked to a sustained low level of interest rates and expectations of a continued low level.

At end-May 2015, the markets expected interest rates in Europe and Denmark to remain low in the coming years. The combination of an upswing in the Danish economy and extraordinarily low interest rates means that the conditions for build-up of

<sup>1</sup> See Carina Moselund Jensen and Morten Spange, The pass-through of interest rates and the demand for cash when interest rates are negative, Danmarks Nationalbank, *Monetary Review*, 2nd Quarter 2015

systemic risks exist. It could be brought on by e.g. excessive risk appetite among credit institutions and borrowers. The extraordinarily low interest rates could speed up this development and lead to faster build-up of systemic risk.

For the insurance and pension sector, a sustained period of low interest rates could challenge the ability to meet future pension disbursement commitments in the longer term. This applies particularly to companies with a large share of guaranteed benefit pensions. However, the sector has been moving towards fewer interest rate guarantees and a higher share of market rate products. Recently, the companies have increased their alternative investments, including direct loans to firms, in order to boost returns, cf. Chapter 2.

In a situation where market conditions are changing, very uniform investment strategies may increase the risk that several institutions respond in the same way. The response pattern in the insurance and pension sector, which is very large in Denmark, could thus amplify market developments. This underscores the importance of taking herd mentality in connection with strong price fluctuations into account in the individual company's risk management.

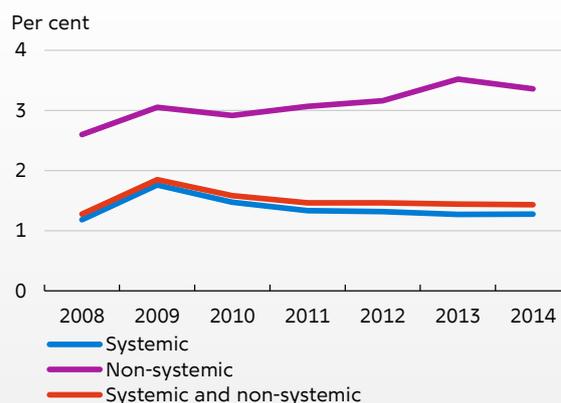
## BANK EARNINGS IN THE CURRENT INTEREST RATE ENVIRONMENT

Bank earnings are affected by the negative interest rates through several channels. One channel is the banks' net interest income, which accounts for the lion's share of bank earnings. Another channel is income from trading and value adjustment of bonds and derived products such as interest rate swaps.<sup>2</sup> Net interest income in relation to the banks' interest-bearing assets, i.e. the net interest margin, has been decreasing slightly since 2009 for the Danish banks taken as one, cf. Chart 4.2. This development seems to be continuing in 2015, as net interest income was lower in the 1st quarter of 2015 than in the 4th quarter of 2014. The slightly decreasing net interest margin reflects factors such as the banks' risk appetite, increased

<sup>2</sup> On the basis of a questionnaire survey among the largest banks in March 2015, the Danish Financial Supervisory Authority assesses that the net effect of negative interest rates on the banks' earnings is limited. However, the low interest rates may constitute a further challenge for the banks that are already posting negative earnings.

Net interest margin for banks

Chart 4.2



Note: The net interest margin has been calculated as net interest income as a percentage of interest-bearing assets.

Source: Danish Financial Supervisory Authority and own calculations.

competition and the low level of interest rates, cf. Box 4.1.

Interest income is the return on the banks' interest-bearing assets, while interest costs are the funding costs linked to the banks' interest-bearing liabilities. The composition of the banks' balance sheets has a strong impact on how interest rate developments affect the banks' interest income and costs. Since 2008, the banks have generally increased their deposit funding, and for the sector overall a large customer funding gap has made way for a customer funding surplus, cf. Chart 2.5. In general, a downward trend in interest rates on the banks' interest-bearing assets can be countered by letting interest rates on interest-bearing liabilities move in parallel with those of the assets.

The banks' own ROE targets and the returns expected by investors should also reflect current market conditions, especially the level of interest rates, cf. Chapter 2. So when interest rates fall, banks can be assumed to adjust their ROE targets downwards while investors lower their return requirements.

The composition of bank assets and liabilities is examined below, followed by a discussion of alternatives to lower interest rates on bank liabilities

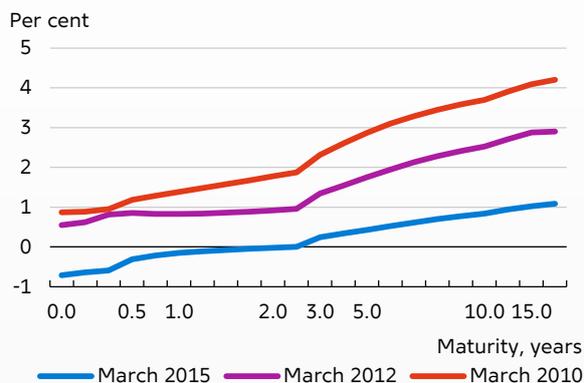
In recent years, interest rates have fallen for both short and long maturities, cf. Chart A. The banks' net interest income may be affected by the level of interest rates as well as the slope of the interest rate curve and a number of other factors such as competition within the sector and demand for loans.

The relationship between the level of interest rates, the slope of the interest rate curve and net interest income can be illustrated by a simple bank transaction. The bank can generate net interest income via three channels:

- The bank's investments, e.g. lending, entail a risk of losses and illiquidity. This is reflected in the bank charging a margin in relation to a risk-free rate of interest in order to cover this risk, cf. distance *a* in Chart B (left).
- The bank can obtain inexpensive funding, e.g. via deposits, and in many cases this is cheaper than the risk-free rate of interest, cf. distance *b* in Chart B (left).
- The maturity is much shorter for the bank's funding than for its investment. If both funding and investment are at a fixed rate of interest, this will make a positive contribution to the bank's interest margin, cf. distance *c* in Chart B (left). However, in most cases the funding and investments of Danish banks are at variable rates of interest and hence interest rate risk plays only a small role in relation to net interest income.

In an interest rate environment with positive rates of interest and a positive slope of the interest rate curve, the sum of these three effects will be a positive net interest margin. In the current situation with negative interest rates, the bank's funding margin may be squeezed, e.g. because it is difficult to set negative deposit rates. In some cases, the sign of the funding margin may change, i.e. the bank's average funding costs exceed the risk-free rate of interest, cf. Chart B (right).

Chart A. Development in the Danish swap curve

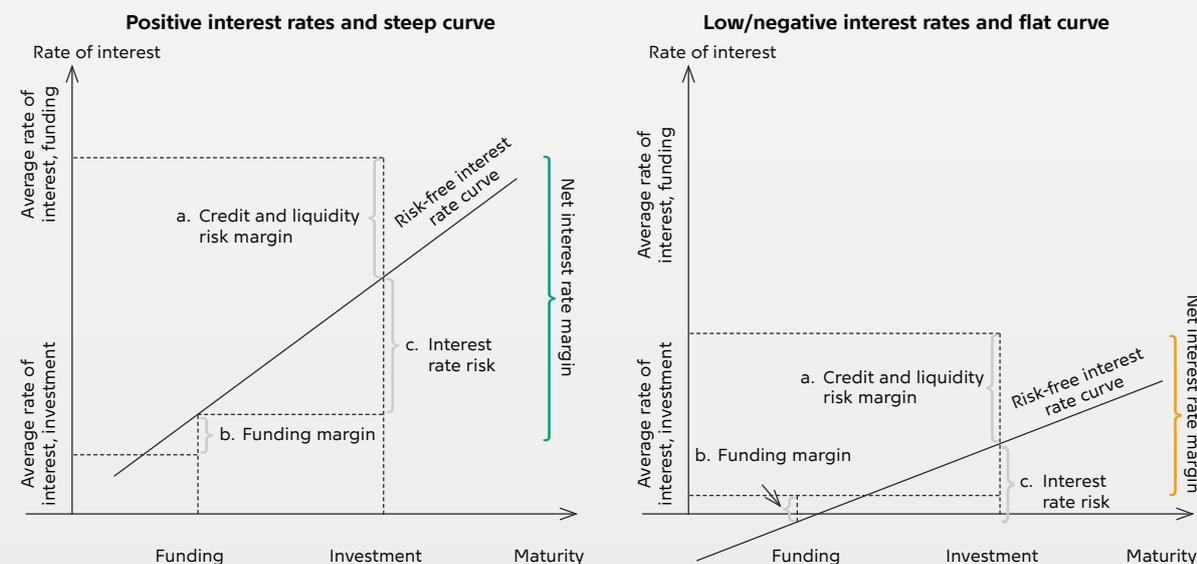


Note: Swap curves from 26 March of each of the years stated.  
Source: Nordea Analytics.

It is easier for large banks to maintain access to raise loans in the market, and hence to other sources of funding than deposits, than it is for small banks. Small banks typically have a larger share of deposit funding so, all else equal, their funding margins will be squeezed more than those of the larger banks as a result of the difficulties in setting negative deposit rates. Deposits made up 69 per cent of the non-systemic Danish banks' total equity and liabilities at end-2014, while the corresponding figure for the systemic banks was 38 per cent.

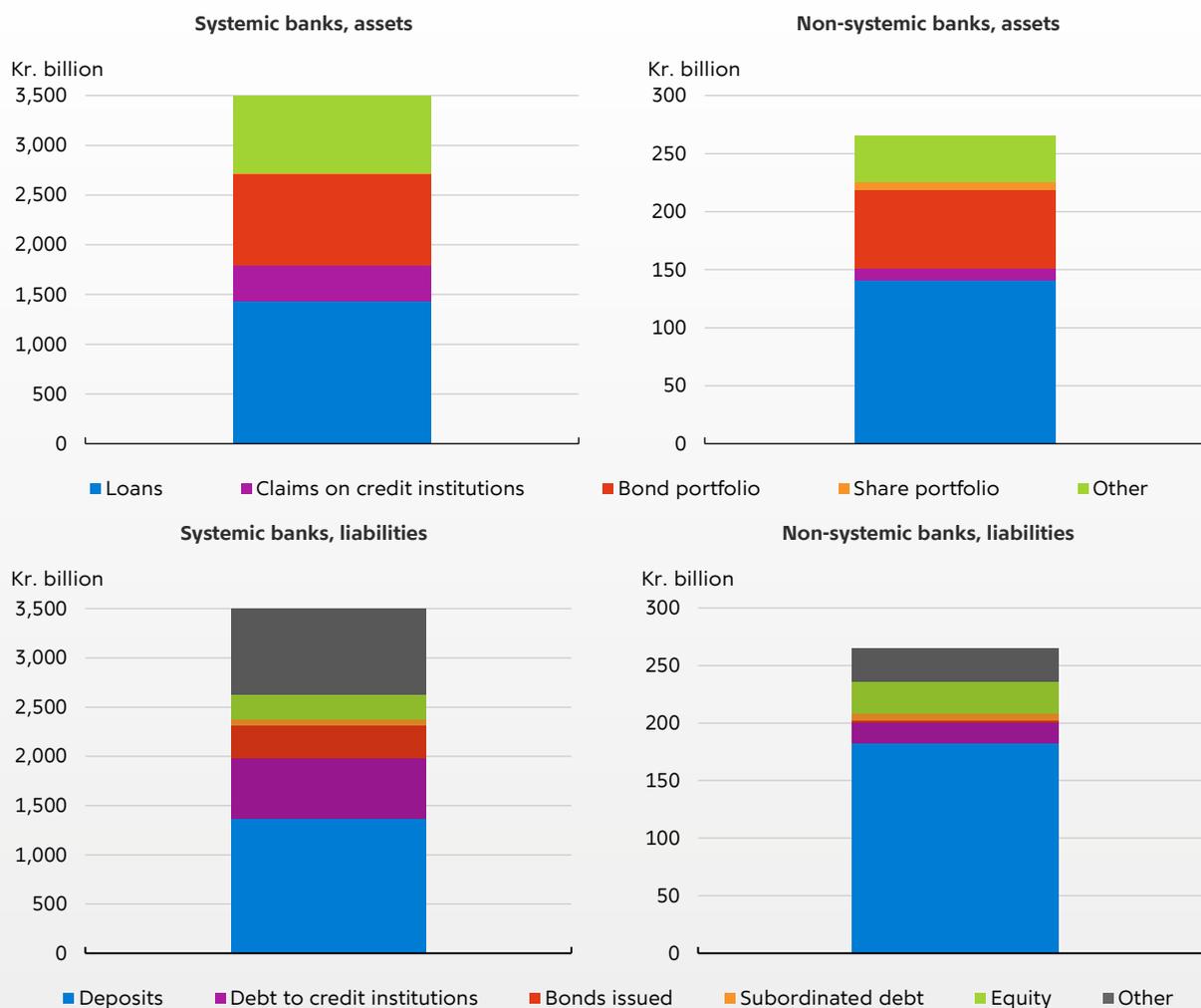
A possible response to the pressure on the net interest margin is to assume more credit or liquidity risk in order to increase the margin. However, the higher risk will lead to heavier loan impairment charges and losses and greater fluctuations in capitalisation over time.

Chart B: Illustration of relationship between level of interest rates, slope of the interest rate curve and net interest income



Composition of assets and liabilities for systemic and non-systemic banks

Chart 4.3



Note: The charts show the banks' balance sheets at end-2014.  
 Source: Danish Financial Supervisory Authority and own calculations.

when it comes to countering the earnings pressure caused by negative interest rates.

**ASSETS AND INTEREST INCOME**

Loans, bonds and claims on credit institutions make up a large share of the banks' assets, cf. Chart 4.3 (top).

The rates of interest on the banks' holdings of bonds and claims on credit institutions generally mirror market rates. This means that interest income from these assets has fallen in recent years as interest rates have declined, while the banks' asset composition has changed only little.

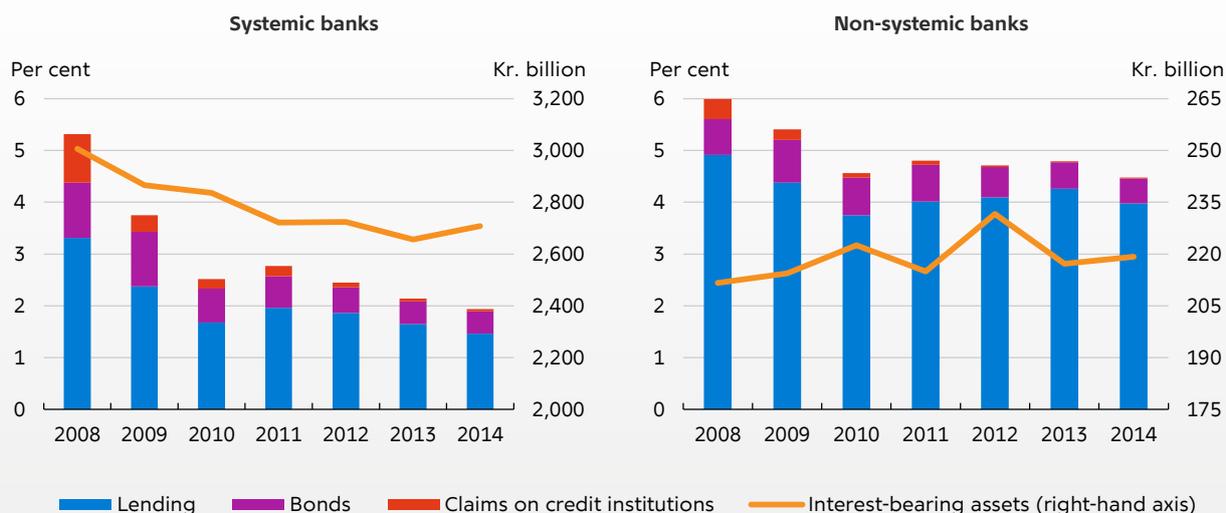
The fall in interest rates in early 2015 means that a larger share of the bonds held by banks earns interest at a negative rate. This may give

the banks an incentive to invest in longer-term or more risky bonds in order to achieve a positive or higher return. So far there are no indications that the banks have increased their investments in lower-rated bonds, as the share of bonds with a credit rating of BBB+ or lower has been unchanged at approximately 5 per cent over the last year. But there is a slight tendency for the remaining maturity of the bond portfolios to have risen in February and March 2015.

Lending rates do not always follow market rates closely. For example, the margin between lending and market rates widened substantially in 2009 and 2011-12. As market rates have fallen, interest income from lending has made up a larger share of the banks' interest income, cf. Chart 4.4.

## Interest income

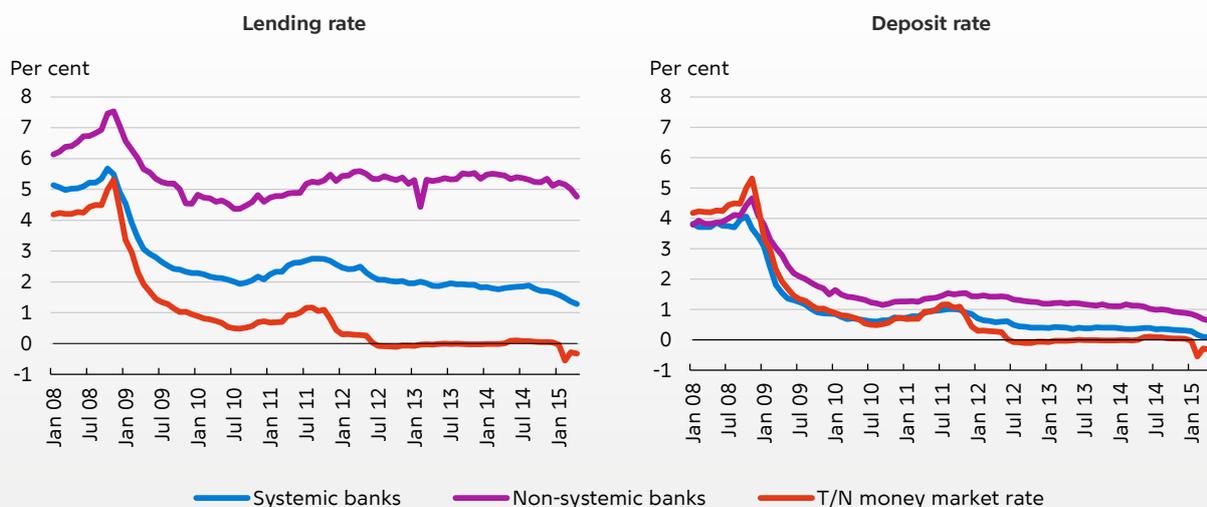
Chart 4.4



Note: Interest income as a percentage of interest-bearing assets excluding derivatives.  
Source: Danish Financial Supervisory Authority and own calculations.

## Average lending and deposit rates for systemic and non-systemic banks

Chart 4.5



Note: Interest rates comprise deposits and lending in all currencies. The most recent observations are from April 2015.  
Source: Danmarks Nationalbank.

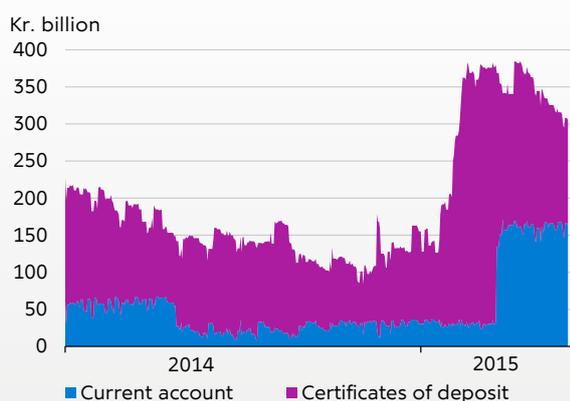
The non-systemic banks have achieved a higher return on interest-bearing assets than the systemic banks. This reflects a higher average lending rate among non-systemic banks, cf. Chart 4.5, partly as a result of a different loan composition with a higher level of impairments.

### Deposits at Danmarks Nationalbank

At end-May 2015, the banks' deposits in current accounts at Danmarks Nationalbank yielded a return of 0 per cent, while investments in certificates of deposit yielded a return of -0.75 per cent. In view of the increased demand for kroner, Danmarks Nationalbank intervened in the foreign

### Certificates of deposit and current account deposits

Chart 4.6



Note: The most recent observation is from 1 June 2015.  
Source: Danmarks Nationalbank.

exchange market in January and February 2015 in order to keep the exchange rate stable. In this connection, the monetary policy counterparties' net position vis-à-vis Danmarks Nationalbank increased from approximately kr. 120 billion to approximately kr. 360 billion. The current account

limit meant that a large share of this liquidity was placed in certificates of deposit, cf. Chart 4.6.

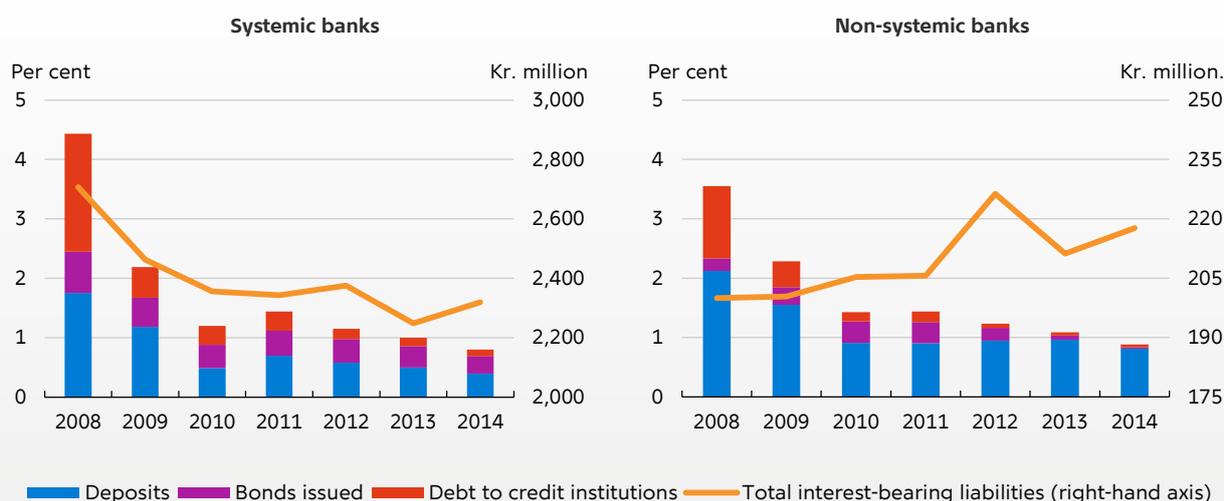
Much of the increase in the net position was attributable to the banks' hedging of forward exchange contracts for domestic and foreign investors. By concluding and hedging forward contracts the banks have, overall, achieved a positive net return despite the negative return on their holdings of certificates of deposit.<sup>3</sup> In March 2015, Danmarks Nationalbank increased the overall current account limit from kr. 37 billion to kr. 173 billion. This means that some of the funds which the banks need to deposit – roughly corresponding to the funds deposited before the pressure on the krone – accrue interest at 0 per cent instead of the negative rate of interest on certificates of deposit.

### LIABILITIES AND INTEREST COSTS

The banks' equity and liabilities are mainly made up of customer deposits, deposits from other credit institutions, bonds issued and equity, cf. Chart 4.3 (bottom). As with assets, a number of the banks' funding sources are closely linked to developments in market interest rates. Hence, interest costs on short-term debt to other credit

### Interest costs

Chart 4.7

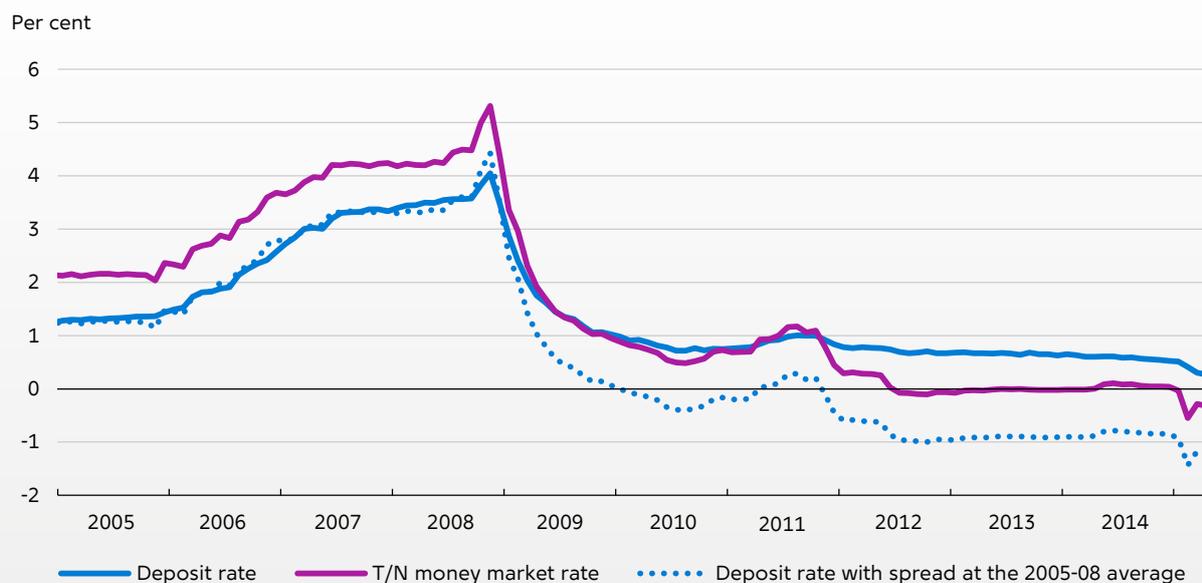


Note: Interest costs as a percentage of interest-bearing liabilities excluding derivatives and subordinated debt.  
Source: Danish Financial Supervisory Authority and own calculations.

<sup>3</sup> Cf. The Danish krone under pressure in January-February 2015, Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2015.

Deposit rate and money market rate

Chart 4.8



Note: Rate of interest on outstanding deposits in all currencies.

Source: Danmarks Nationalbank and own calculations. The most recent observations are from April 2015.

institutions and bonds issued will fall in step with market rates, cf. Chart 4.7.

However, there seems to be some stickiness in the downward adjustment of deposit rates when interest rates are very low, cf. below.

### Effect on bank earnings via deposit rates

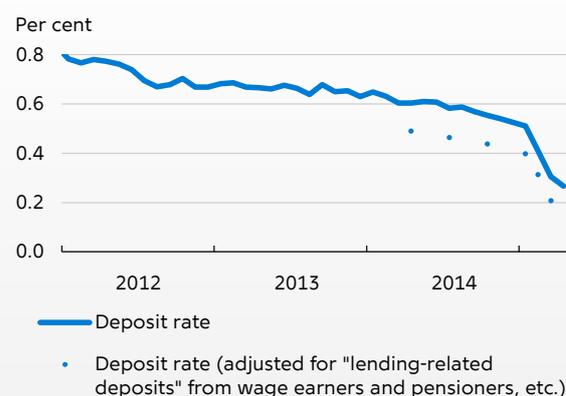
Since deposits from households and the corporate sector are an important source of funding for many banks, adjustment of deposit rates will have a major impact on earnings. In the period 2005-08, the average deposit rate was approximately 0.9 percentage point lower than the overnight interest rate in the money market, cf. Chart 4.8. Deposit rates have not fallen in step with interest rates since 2008, and especially the fall in interest rates in 2011-12 had little impact on average deposit rates. In the 1st quarter of 2015, the average deposit rate was 0.7 percentage point higher than the money market rate. If the spread seen in the period 2005-08 had been maintained, the average deposit rate would have been well below zero today.

However, the average deposit rate is to some extent buoyed up by the rate of interest on deposits directly linked to bank mortgage loans. When a bank grants a mortgage loan, the cus-

tommer is often also offered a deposit account which accrues interest at the lending rate. Since the lending rate is normally substantially higher than the average deposit rate, this type of loan will push up the average deposit rate. The adjust-

Average deposit rate adjusted for lending-related deposits

Figur 4.9



Anm.: A "lending-related deposit" is a loan against real property as collateral where the customer, when taking the loan, is also offered a deposit account that accrues interest at the lending rate. The most recent observation is from April 2015.

Kilde: Danmarks Nationalbank.

ed deposit rate is approximately 0.1 percentage point lower, cf. Chart 4.9.

The average return on deposits varies considerably across banks. This is to some extent attributable to differences in deposit and customer types and the need to retain depositors.

Negative deposit rates have initially been seen for professional customers such as institutional investors and large firms, for whom the money market is an alternative investment option. On the other hand, many banks can be assumed to keep the rate of interest positive or at zero for deposits from small firms and households, i.e. retail deposits.

On average, the non-systemic banks have a relatively higher deposit rate than the systemic banks, cf. Chart 4.10. This is partly due to banks with a larger share of deposits from households and a smaller share from financial counterparties having a higher average deposit rate.

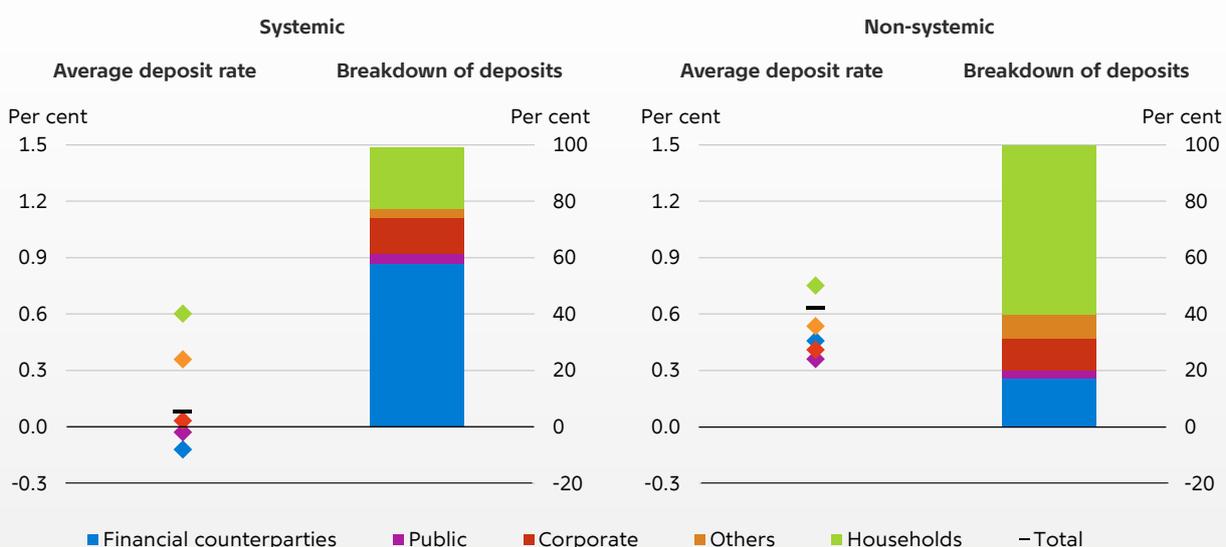
Another explanation of the relatively higher deposit rates of non-systemic banks could be differences in deposit types, as certain banks have a large share of deposits with agreed maturity or deposits redeemable at notice, which generally accrue interest at a higher rate, cf. Chart 4.11.

If these deposits are comprised by contracts already concluded, the rate of interest cannot be reduced with immediate effect. Conversely, the systemic banks have a larger share of repo deposits, for which the rate of interest typically mirrors the market rate closely. Moreover, the non-systemic banks typically have poorer access to market-based funding sources such as bond issuance, which gives them a greater incentive to retain depositors.

The stickiness of deposit rates causes an imbalance between the adaptation of interest rates on the assets and liabilities sides. This imbalance becomes more pronounced the more negative interest rates are and the larger the bank's deposit share is. Deposit rates fell substantially in the first months of 2015. The banks regularly adjust their pricing structures, and deposit rates are increasingly becoming negative, especially for financial counterparties and corporate customers. Danmarks Nationalbank has conducted a survey which shows that corporate customers have almost the same volume of deposits at a negative rate of interest as they have at a positive interest rate. However, the vast majority of corporate loans accrue interest at 0 per cent. The share

**Breakdown of deposits by sector and average sector deposit rate**

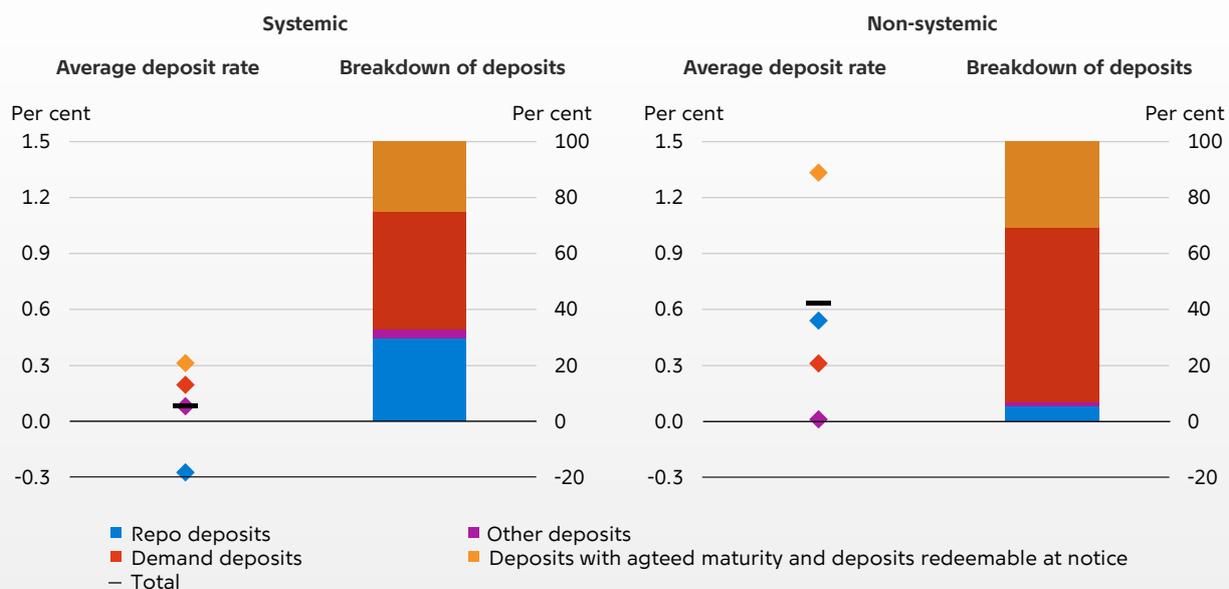
Chart 4.10



Note: "Financial counterparties" are monetary financial institutions (MFIs), insurance companies and pension funds as well as other financial institutions. "Households" covers deposits from wage earners and pensioners. "Corporate" covers deposits from private sector non-financial corporations. "Public" covers local and regional government, public sector non-financial corporations, central government and social security funds. "Others" covers sole proprietorships and non-profit institutions serving households. Data is from April 2015.  
 Source: Danmarks Nationalbank and own calculations.

**Breakdown of deposits by type and average deposit rate for each type**

Chart 4.11



Note: Deposits excluding pooling schemes. "Demand" covers transferable deposits in the MFI statistics. Data is from April 2015.  
 Source: Danmarks Nationalbank and own calculations.

of total deposits that earns interest at a negative rate is still small.

### ALTERNATIVES TO LOWER RETURNS ON THE BANKS' LIABILITIES

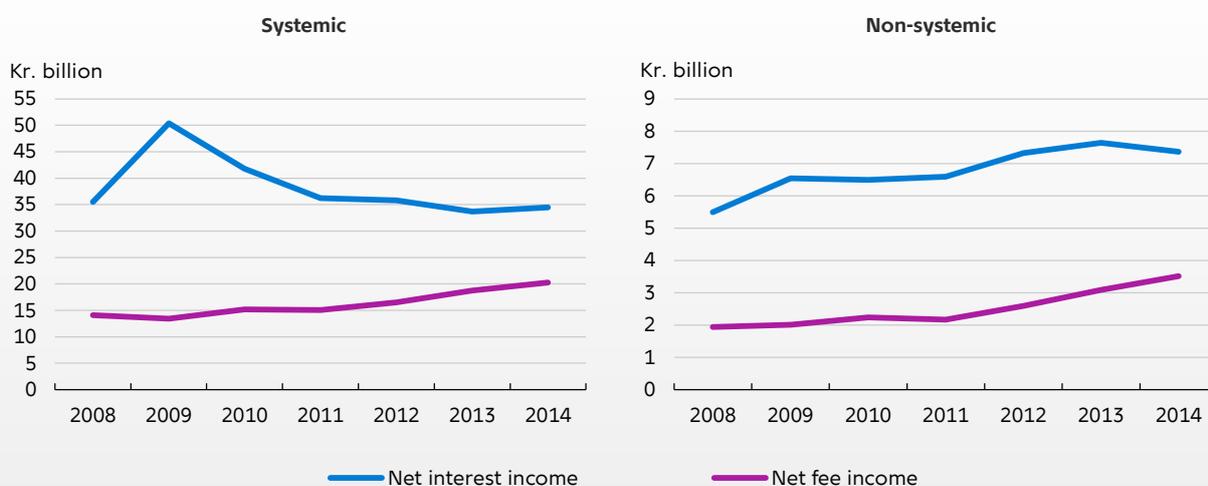
The earnings pressure from a lower net interest margin has been offset by higher fee income. Net

fee income rose by 8 and 14 per cent, respectively, for the systemic and non-systemic banks from 2013 to 2014 and is becoming an increasingly important source of earnings, cf. Chart 4.12.

Instead of reducing interest rates for deposits and other liabilities, banks can boost net interest income by increasing interest income from lend-

**Net interest and fee income**

Chart 4.12



Source: Danish Financial Supervisory Authority.

ing. This can be achieved either by raising lending rates or by increasing the loan volume or changing the loan composition. Over the last few years, when demand for loans has been low and competition for borrowers has intensified, there has been a tendency for lending rates and margins to decrease slightly. Consequently, there is presumably a limit to how much the banks can increase their net interest income by raising lending rates.

## IMPACT OF NEGATIVE INTEREST RATES ON MORTGAGE BANKS

The lower monetary policy interest rates have filtered through to the mortgage banks. The rate of interest on adjustable rate loans with short fixed interest periods has been negative since February 2015, while the long-term rate fell to approximately 2.1 per cent in February, cf. Chart 4.13(right). The spread between short-term and long-term bond yields averaged 2.3 percentage points in the first four months of the year.

In the current interest rate environment, a rising number of homeowners have chosen to remortgage or raise additional loans against their home equity. So in the first four months of 2015 the number of loan offers was high relative to the level in recent years, cf. Chart 4.13(left). If an offer

results in remortgaging, the borrower must pay a fee to the mortgage bank. Hence the current situation with low and falling interest rates may increase the earnings of the mortgage banks. Remortgaging also boosts the earnings of banks that have concluded cooperation agreements with mortgage banks.

### HANDLING NEGATIVE RATES OF INTEREST ON MORTGAGE LOANS

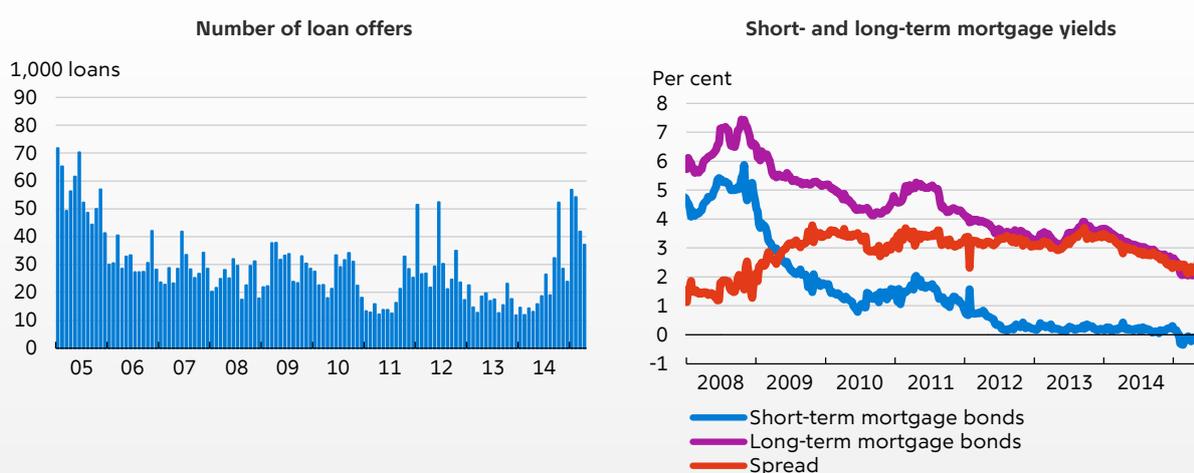
Negative rates of interest on mortgage loans have raised a number of issues in relation to the practical, contractual and tax-related handling of negative interest. Against this background, the Minister for Business and Growth in February 2015 set up a rapid task force to identify potential issues in relation to negative rates of interest on mortgage loans.

As regards taxation, the Danish tax authorities, SKAT, on 27 February 2015 issued guidelines describing the taxation and deductibility of negative interest. The guidelines state that interest income in the form of a negative rate of interest is taxable for the borrower, while interest costs in the form of a negative rate of interest are deductible for the lender.

The task force on negative rates of interest on mortgage loans published a report in April 2015. The report concludes that negative rates of

**Number of loan offers and short- and long-term mortgage yields**

Chart 4.13



Note: The left-hand chart shows the number of loan offers from mortgage banks for financing private homes and commercial properties. The most recent observation is from April 2015. In the right-hand chart, the short-term yield is the average yield on 1- and 2-year fixed bullets for financing adjustable-rate loans. The long-term mortgage yield is the yield on a 30-year fixed-rate callable bond. Weekly averages. The most recent observations are from the week that began on 25 May 2015.

Source: Association of Danish Mortgage Banks and Danish Mortgage Banks' Federation.

interest do not cause any significant problems in relation to adjustable rate loans, but may constitute a challenge in relation to loans based on variable rate bonds with and without amortisation. As regards *existing* loans, the report concludes that it is up to the individual mortgage bank to determine how it handles negative interest rates. This will depend on the interpretation of the relevant terms and conditions of the loans and bonds and of contract law in general. For *new* loans, the report outlines various models for handling negative rates of interest on loans financed via variable rate bonds – including models with and without interest rate floors – where the borrower receives the negative interest either as a direct disbursement, as a reduction of the outstanding debt or as a capital gain. At the same time, the task force assesses that there is no immediate need for legislation in this area as the individual mortgage bank is free to choose the model that matches its business model best.

Before the report was published, all mortgage banks except Nordea Kredit had announced that for existing loans based on variable rate bonds, typically based on a reference rate such as CITA or CIBOR, an interest rate floor of 0 per cent would apply.<sup>4</sup> As regards new loans, Nordea Kredit and Nykredit in May 2015 announced that in future they will issue mortgage bonds without any interest rate floor.

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4 The CITA rate, Copenhagen Interest T/N Average, is based on the interest rate swaps concluded by the banks when swapping a variable overnight rate for a fixed rate. CIBOR, Copenhagen Interbank Offered Rate, is a reference rate for liquidity offered in the interbank market on an uncollateralised basis.

# APPENDIX



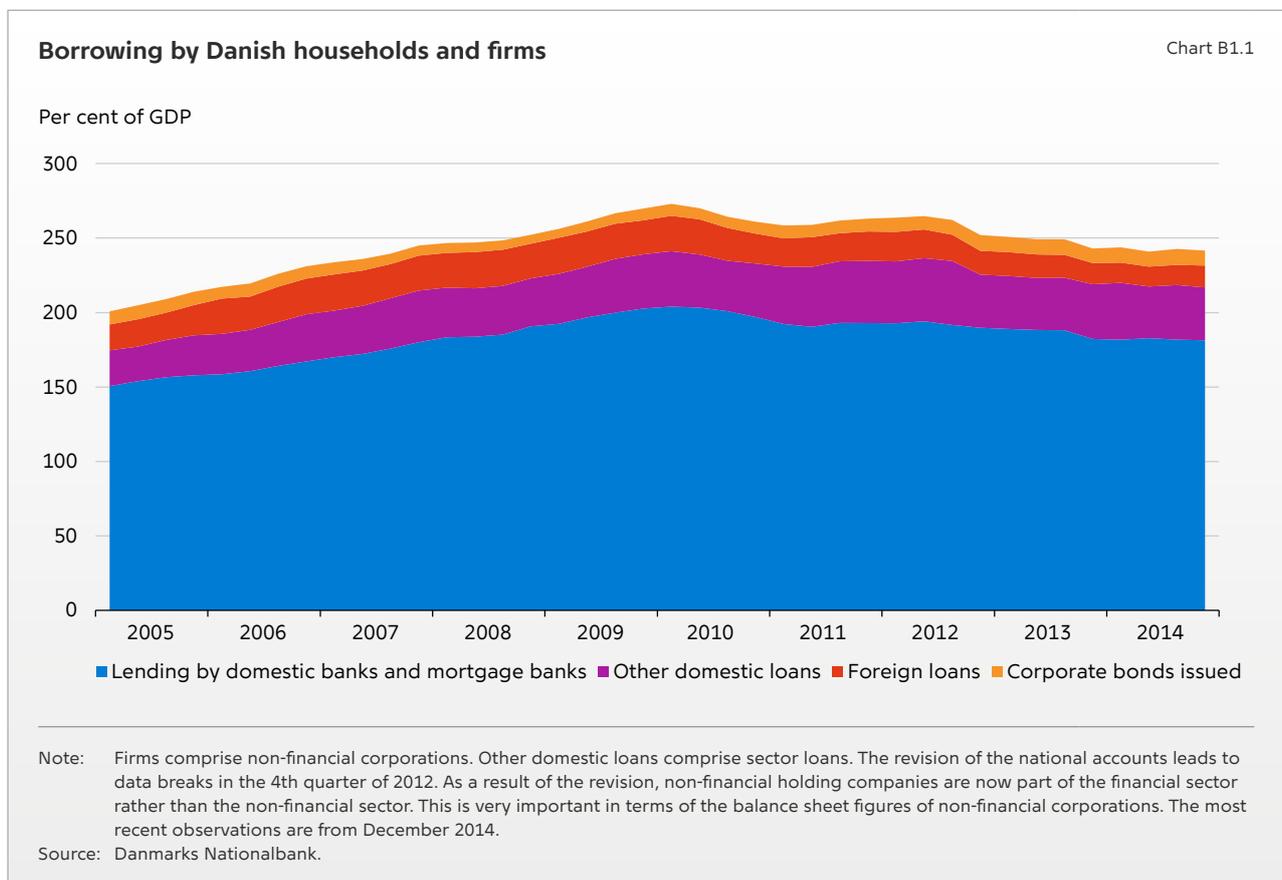
# THE STRUCTURE OF THE DANISH BANK AND MORTGAGE BANK SECTOR

Measured in terms of GDP, the Danish bank and mortgage bank sector is among the largest and most concentrated in Europe. Danish banks and mortgage banks account for the vast majority of lending to Danish households and firms, while only a small portion of lending comes from other financing sources, cf. Chart B1.1.

Total lending by Danish banks and mortgage banks amounts to approximately kr. 4,800 billion.

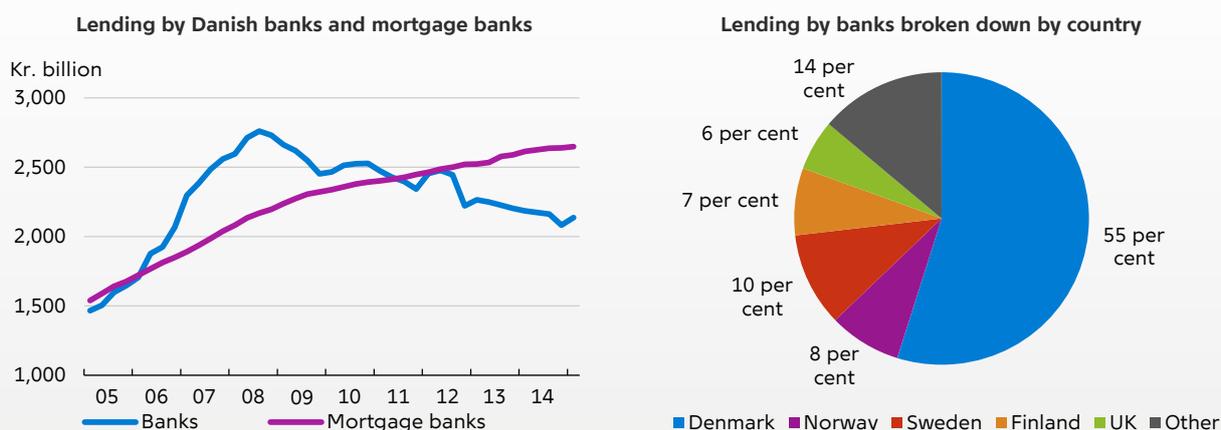
Lending by mortgage banks has been on the rise in recent years and currently accounts for 55 per cent of total lending, cf. Chart B1.2 (left). Lending by mortgage banks is primarily concentrated in Denmark, while lending by banks is distributed on several countries, cf. Chart B1.2 (right).

Danish banks offer a wide range of loan products and other financial services, while mortgage banks exclusively provide loans secured on real



**Lending by Danish banks and mortgage banks and lending by banks broken down by country**

Chart B1.2



Note: Both charts show lending including lending by foreign units. Lending to central banks and credit institutions is not included. The transition to MFI3 leads to data breaks in the 3rd quarter of 2014. The most recent observations are from March 2015.  
Source: Danmarks Nationalbank.

property. In contrast to banks, mortgage banks do not receive deposits from the public, but finance lending through the issuance of mortgage bonds. Mortgage banks provide financing for permanent residences of up to 80 per cent of the property value and financing for commercial properties of up to 60 per cent of the property value.<sup>1</sup> Banks are not subject to the same loan-to-value, LTV, limits and often offer to finance the portion of the property value exceeding the LTV limit for mortgage credit, less a small down payment.

The four largest banks are all affiliated with a mortgage bank, while many small banks have entered into agreements with one or more mortgage banks on the provision of mortgage loans. Bank loans are usually variable rate loans, while mortgage loans have traditionally been based on a model with a fixed interest rate for the life of the loan and with amortisation. In 1996, Danish mortgage banks were permitted to provide long-term adjustable rate mortgages, typically financed through issuance of short-term fixed rate mort-

gage bonds. In 2003, they were also permitted to provide mortgage loans with deferred amortisation for up to 10 years.<sup>2</sup> Following liberalisation, a number of new product varieties, such as deferred amortisation loans with annual interest rate fixing, have become increasingly prevalent, cf. Chart B1.3. Since mid-2014, the portion of traditional fixed rate loans with amortisation has increased, while the portion of deferred amortisation loans with annual interest rate fixing has declined.

The number of banks has been declining for several decades, cf. Chart B1.4. In June 2015, the Danish bank and mortgage bank sector comprised 76 banks and 7 mortgage banks.

#### POPULATION IN THE REPORT

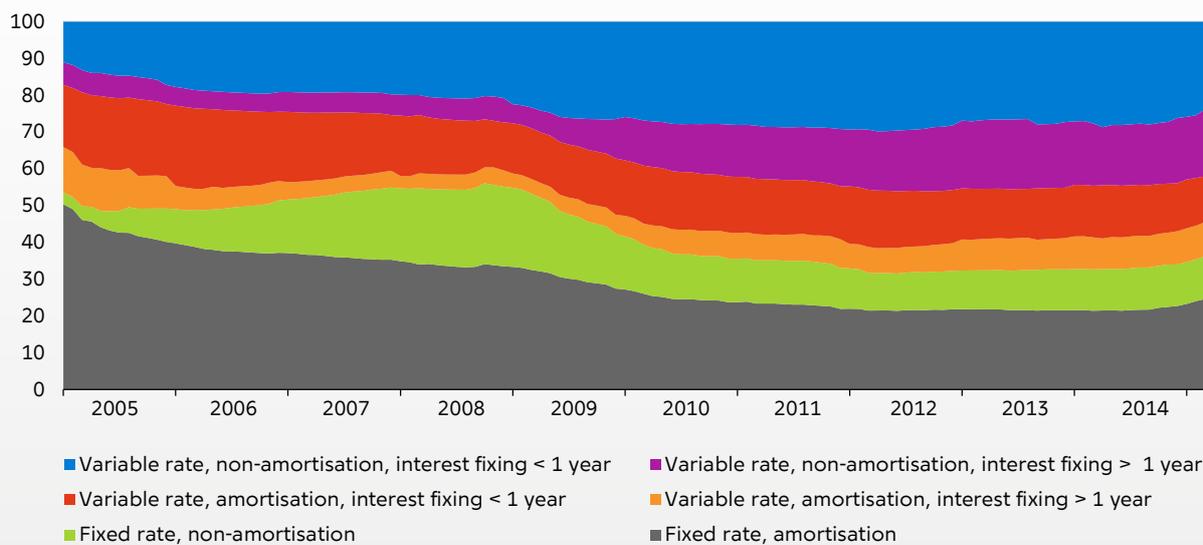
In this report, Danske Bank, Nykredit Realkredit, Jyske Bank, Nordea Bank Danmark, Sydbank and DLR Kredit are referred to as *systemic groups*, cf. Table B1.1. This term covers activities in both banking and mortgage banking. In June 2014, these six groups were designated as systemically important financial institutions (SIFIs) in Den-

1 For loans based on covered bonds the LTV limit for commercial properties may be increased to 70 percent if top-up collateral is provided for the portion of the loan exceeding 60 per cent of the property value.

2 For a loan with an original maturity of 30 years, the expiry of the 10-year deferred amortisation period means that the principal must be repaid over 20 years. In practice, the deferred amortisation period can often be extended by refinancing the loan with a new deferred amortisation loan at the expiry of the first deferred-amortisation period.

**Mortgage loans for owner-occupied homes and summer cottages broken down by loan type** Chart B1.3

Per cent

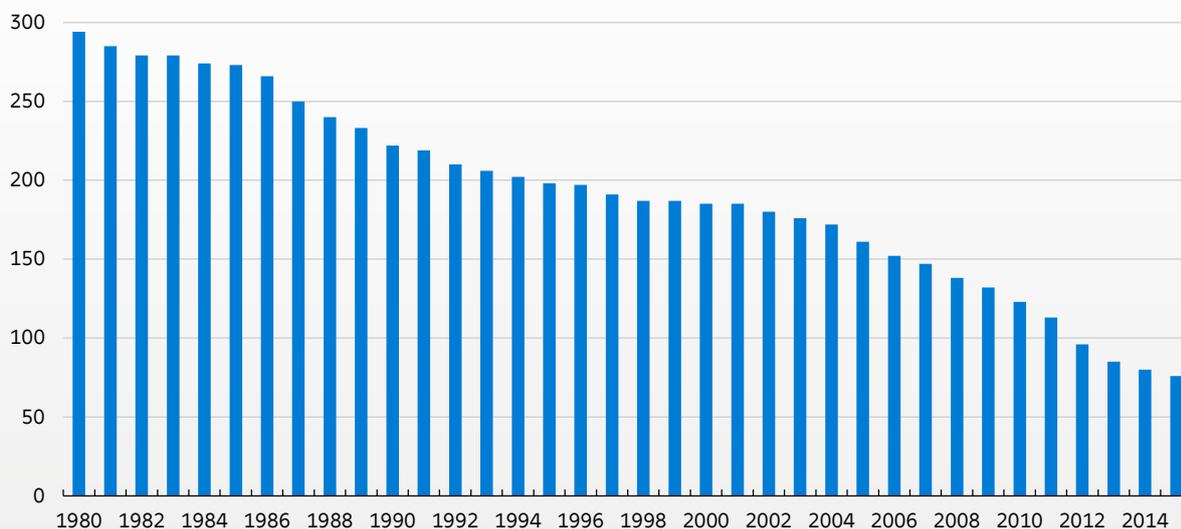


Note: The breakdown is based on the period until the next interest rate fixing. Consequently, some loans with fixed interest periods of more than 1 year will be included in the category of up to and including 1 year.  
 Source: Danmarks Nationalbank.

**Number of banks in Denmark**

Chart B1.4

Number



Note: Banks in the Danish Financial Supervisory Authority's groups 1-4. Data is stated at year-end. The 2015 observation is from 19 May 2015.  
 Source: Danish Financial Supervisory Authority.

mark by the Minister for Business and Growth. This designation is based on three indicators of systemic importance:

- Balance sheet as a percentage of GDP > 6.5 per cent.
- Lending as a percentage of total sector lending > 5 per cent.
- Deposits as a percentage of total sector deposits > 5 per cent.

A number of the analyses of the report, e.g. the stress test, are based only on data for banks. The report classifies banks as *systemic banks* and *non-systemic banks*. Systemic banks are the banks in the Danish Financial Supervisory Authority's

group 1 (banks with working capital of more than kr. 65 billion), while non-systemic banks are the banks in Danish Financial Supervisory Authority's group 2 (banks with working capital of more than kr. 12 billion), excluding Saxo Bank and FIH Erhvervsbank. Saxo Bank has been omitted from the population due to the bank's business model, while FIH Erhvervsbank has been omitted due to discontinuation of activities. Lending by the five systemic and 11 non-systemic banks accounts for 85 and 9 per cent, respectively, of total lending by Danish banks. The analyses of *mortgage banks* comprise data for all mortgage banks. The grouping also applies back in time.

**Banks and mortgage banks in the population by total assets as at 31 December 2014, kr. million**

Table B1.1

	Beløb		Beløb
<i>Systemic groups</i>		Vestjysk Bank	21,804
Danske Bank (including Realkredit Danmark)	3,453,015	Ringkjøbing Landbobank	21,238
Nordea Bank Danmark (including Nordea Kredit)	817,305	Sparekassen Kronjylland	16,697
Jyske Bank (including BRFkredit)	541,679	Den Jyske Sparekasse	16,045
Nykredit Realkredit (including Nykredit Bank)	1,458,153	Sparekassen Sjælland	14,502
Sydbank	152,316	Alm. Brand Bank	14,292
DLR Kredit	157,637	Jutlander Bank	14,123
<b>Systemic groups, total</b>	<b>6,580,105</b>	Lån & Spar Bank	13,693
		Sparekassen Vendsyssel	12,727
<i>Systemic banks</i>		<b>Non-systemic banks, total</b>	<b>264,872</b>
Danske Bank	2,276,448		
Nordea Bank Danmark	584,490	<i>Mortgage banks</i>	
Jyske Bank	316,258	Nykredit Realkredit	1,322,918
Nykredit Bank	228,920	Realkredit Danmark	834,591
Sydbank	152,839	Totalkredit	674,753
<b>Systemic banks, total</b>	<b>3,558,956</b>	Nordea Kredit	451,927
		BRFkredit	256,145
<i>Non-systemic banks</i>		DLR Kredit	157,637
Spar Nord Bank	79,691	LR Realkredit	20,364
Arbejdernes Landsbank	40,060	<b>Mortgage banks, total</b>	<b>3,718,335</b>
<i>Continues next column</i>			

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