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Lengthy period of increasing risk appetite in parts of the banking sector

- The times are good for the financial sector. The banks' competition to offer loans puts pressure on their credit standards, which have been eased for quite a while.
- Especially the medium-sized banks have been easing credit standards and are gaining market shares. Low interest rates and rising asset prices boost risk appetite. So it is essential that the competitive pressure does not ultimately affect the risk appetite of the banking system overall.
- This development emphasises the importance of having well-capitalised banks and of building up the countercyclical capital buffer so that the institutions have funds to mitigate the effects when the economy reverses.

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Capacity in the repo market

in Denmark is not being limited by regulatory requirements

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Falling risk weights

reflect increased use of internal models, among other factors

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Banking union participation

can strengthen handling of cross-border systemic branches

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Summary and assessment

Expectations of higher interest rates lead to increased volatility

The global upswing has continued and growth is robust in both advanced and emerging economies. In the USA, monetary policy is gradually being normalised, while the level of interest rates remains very low in the euro area. Following a lengthy period of low stress in the financial markets, volatility in the equity market rose sharply in early February 2018. This episode shows that sudden changes in market participants' expectations of monetary policy may lead to strong increases in risk premia and falling asset prices. There are indications that trade in volatility-related financial products amplified price fluctuations in the underlying assets. The turmoil was brief and did not spread to other markets such as the bond market.

High earnings among systemic credit institutions

The Danish economy is also picking up, which supports financial sector developments. In 2017, the earnings of the systemic credit institutions were record-high for the second year in a row. The financial statements for the 1st quarter of 2018 were also robust. Profits have been boosted in recent years because loan impairment charges have been reversed in view of the improved cyclical position. Extraordinarily high value adjustments also made a positive contribution in 2017.

The low level of interest rates is squeezing net interest income

The net interest income of credit institutions is still falling due to the low level of interest rates, which is squeezing the institutions' interest margins. To limit the fall in net interest income, the institutions have increasingly introduced negative interest rates on corporate deposits. In addition, income from fees and administration margins has risen as interest income has fallen.

Banks are competing on credit standards

In general, the banks have built up large capacity to increase lending. Combined with limited growth in demand for loans, this has intensified competition for customers. Hence, there is a foundation for lowering the credit quality and easing credit conditions that is not reflected in total lending growth. According to Danmarks Nationalbank's lending survey, the banks have gradually eased credit standards for corporate customers since 2013, mainly due to pressure from

competitors. According to the survey, the medium-sized banks have eased their standards the most.

The medium-sized banks gain market shares in periods of high risk appetite

There is a large spread in lending growth across the sector, and growth tends to be particularly high among the medium-sized banks, which have started gaining market shares recently. In the period up to the latest financial crisis, market shares of the medium-sized banks also rose amid economic growth and high risk appetite. Back then, some of the banks contributed to the pressure on credit standards and credit quality requirements in the market. It is essential that the competitive pressure does not ultimately affect the risk appetite of the banking system overall.

Growth in lending to corporate customers is concentrated on the cyclical industries

As regards corporate lending, lending to cyclical industries such as building and construction, trade and property trading and letting has shown the strongest growth since 2014. Firms in cyclical industries have previously experienced large fluctuations in financial performance as a result of cyclical fluctuations. Consequently, the banks should assess the financial robustness of loan applicants over the entire business cycle.

Households may be vulnerable to rising interest rates combined with falling house prices

In recent years, households have opted for mortgage loans with longer fixed interest periods. More than half of all mortgage loans are still at variable rates of interest. So a rise in interest rates will have a marked impact on the interest burden of homeowners. Highly indebted households are particularly vulnerable to changes in interest rates. In 2016, one third of homeowner debt was held by households whose total debts exceeded the value of their homes. For highly indebted households, it is important to amortise the debt in order to reduce vulnerability to rising interest rates and falling house prices in the future.

Non-systemic banks are challenged in severe stress scenario

The results of Danmarks Nationalbank's stress test show that the systemic institutions have capital to withstand a severe recession, but several are close to exceeding the capital buffer requirements. Several of the small, non-systemic banks are challenged in

the stress test, and some may have difficulty meeting the minimum capital requirement. Before the non-systemic banks reach the minimum requirement, the authorities will be able to step in if the buffer requirements are not met.

The countercyclical buffer has now been activated

On the basis of a recommendation from the Systemic Risk Council, the Minister for Industry, Business and Financial Affairs in March 2018 decided to set a countercyclical capital buffer rate for exposures in Denmark of 0.5 percentage point with effect from 31 March 2019.

The buffer is to be used to counter a negative impact on the real economy when the financial system is stressed. In that situation the buffer must be released. A buffer of 0.5 percentage point is a very modest counterweight to the potential losses during an economic downturn, so it is important that the buffer rate is increased if risk continues to build up.

Ample liquidity in the financial sector

Liquidity is high in the Danish financial sector and all credit institutions observe the Liquidity Coverage Ratio, LCR, with a certain margin. The systemic banks primarily hold highly liquid assets in their liquidity buffers, which contributes to the robustness of their liquidity reserves. But in the calculation of the LCR, the current adjustment of repo lending and deposits may have unintended consequences for the assessment of the institutions' portfolios of liquid assets.

Capacity in the repo market is assessed to be sufficient

The Danish repo market, which helps to support liquidity in the sector, has shrunk in recent years. In general, developments seem to be a result of falling demand, reflecting factors such as declining interest rates and narrowing interest rate spreads. There are no indications that Danish credit institutions' supply of repo financing is curbed by the new regulations. Consequently, it is assessed that the institutions have the capacity to increase their repo lending without breaching the regulatory requirements.

Risks linked to systemically important branches can be handled in the banking union

Danske Bank's increasing activities in Sweden and

Norway exemplify how the Nordic-Baltic banking market is becoming still more integrated. In step with the growing financial integration, close cooperation between the various national authorities is becoming more important in relation to safeguarding financial stability. In the assessment of Danmarks Nationalbank, the systemic risks linked to the cross-border activities of the large institutions are best handled via strengthened collaboration within the banking union, where there is a single central supervisory authority and resolution authority.

Expectations of higher inflation and interest rates lead to increased volatility

The global economy is picking up steam

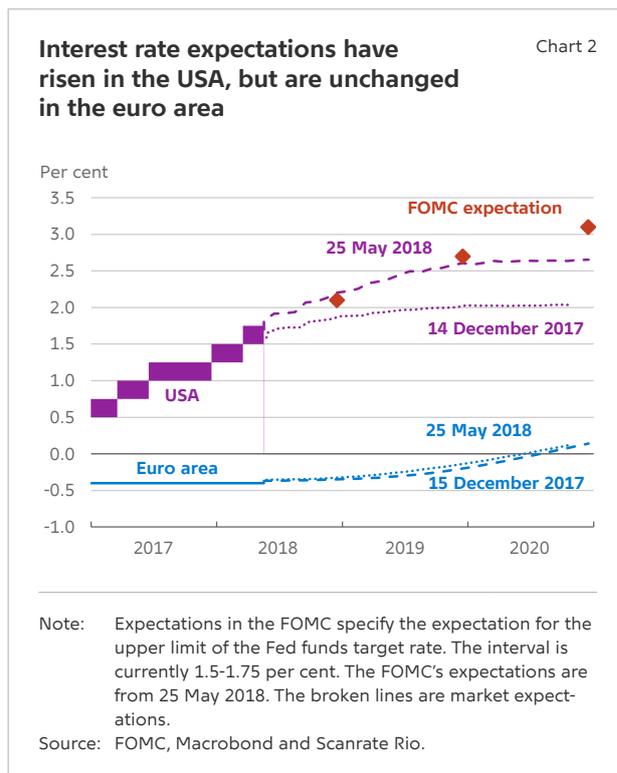
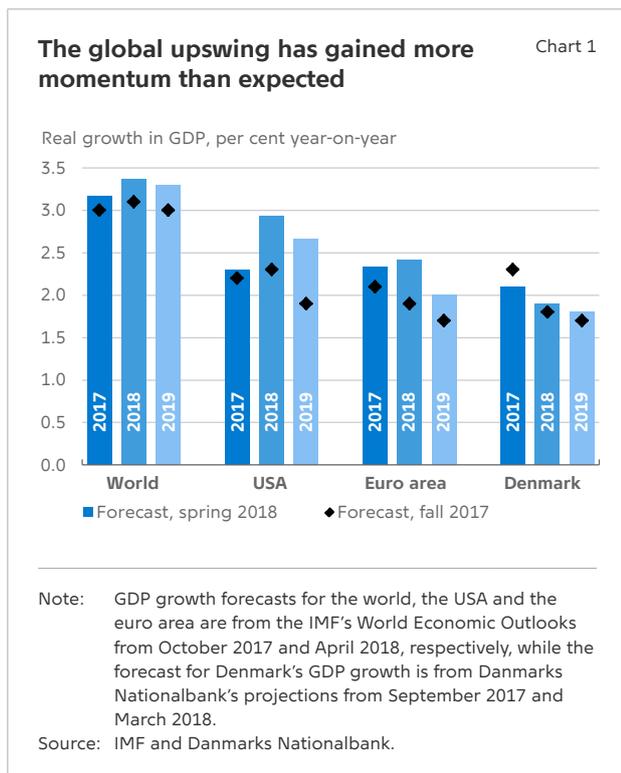
The global upswing has continued and growth is robust in both advanced and emerging economies. In the last six months, the upswing has been stronger than expected and economic forecasts have been adjusted upwards, cf. Chart 1. Global growth is expected to be 3.4 per cent in 2018, while growth in the euro area and the USA is expected to be 2.4 and 2.9 per cent, respectively.¹

At the same time, the IMF, the OECD and the European Commission all observe larger negative risks to the global upswing in the medium term. The impact of sudden interest rate shocks, asset price corrections, protectionism and geopolitical tensions are all mentioned as risks. The International organisations also caution against procyclical fiscal policy, notably in the United States.

Expectations of rising interest rates

The upswing in the USA and the euro area has led to rising pressure on the labour markets and has brought forward market participants' expectations that monetary policy will be normalised. Since December 2017, market participants' expectations of future interest rate increases in the USA have moved closer to the expectations of the Federal Open Market Committee, FOMC, cf. Chart 2. The FOMC has raised

¹ IMF, *World Economic Outlook*, April 2018. ([link](#))



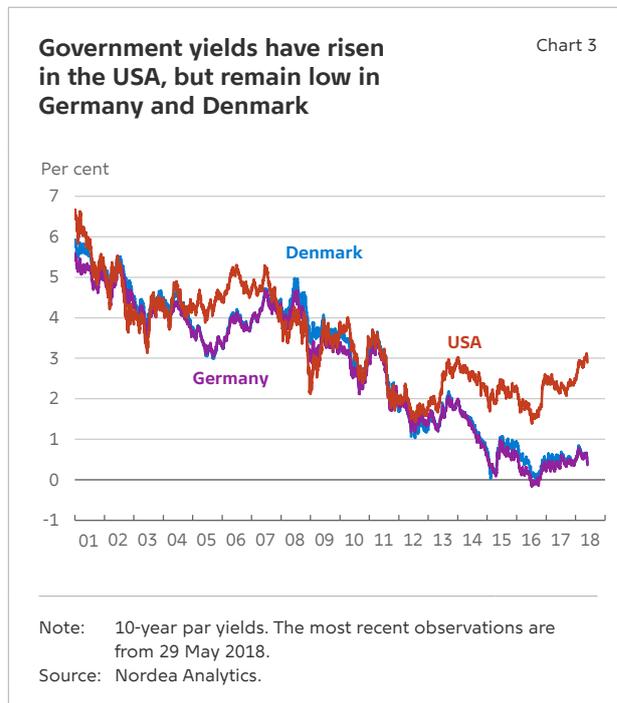
the interest rate once in March 2018 and in its forecast envisages a further two increases in 2018 and two in 2019. Furthermore, in October 2017 the Federal Reserve gradually began to reduce its balance sheet.

In the euro area, the European Central Bank, ECB, has kept its monetary policy interest rates unchanged, but from the turn of the year monthly net purchases under the asset purchase programme have been halved to 30 billion euro. The programme runs until September 2018 with the option of further extension. Market expectations of rising interest rates in the euro area were brought forward in the first months of 2018, but have been postponed again. The first interest rate increase is expected in 2019.

In the USA, the 10-year Treasury yield has risen since September 2017, to more than 3 per cent in April 2018, cf. Chart 3. German and Danish government yields rose in early 2018, reflecting, inter alia, expectations of faster normalisation of monetary policy, but they have fallen again and remain very low.

Short, but sharp adjustment in the equity market

In early February, the equity market was characterised by high volatility. Following a lengthy period of rising prices in the market, the benchmark stock indices dived, cf. Chart 4 (left). In just one week, the



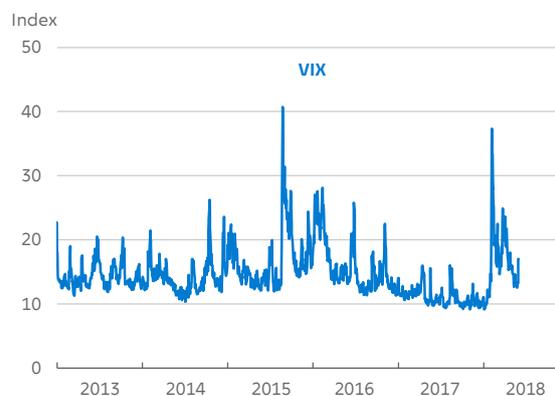
Strong adjustment in the equity market in February 2018

Chart 4

Stock indices



Volatility index, VIX



Note: The stock indices are OMXC25 for Denmark, Eurostoxx 50 for the euro area and S&P 500 for the USA. The most recent observations are from 30 May 2018. VIX is a US volatility index based on implied volatilities on S&P 500 index options with a maturity of 30 days, i.e. investor expectations of volatility over the next month. Daily observations are shown here, the most recent one being 30 May 2018.

Source: Bloomberg.

S&P 500 index fell by 9 per cent, while the EuroStoxx 600 and OMXC25 indices fell by 5 and 2 per cent, respectively. The falls came immediately after the publication of better-than-expected wage growth figures for the USA. This induced market participants to adjust their expectations of inflation, and hence the speed at which monetary policy would be normalised, upwards.

Concurrently with the fall in equity prices, implied volatility, measured by the VIX index, rose strongly, cf. Chart 4 (right). The VIX measures investors' expectations of fluctuations in the S&P 500 over the next month, calculated on the basis of prices for S&P 500 option contracts. The VIX rose to a level not seen since August 2015.

The strong falls in equity prices indicate that sudden changes in market participants' expectations regarding normalisation of monetary policy may lead to soaring risk premia and falling asset prices.

The effects of volatility-based speculation

There are indications that the market fluctuations cannot be explained by changes in inflation expectations in the market only, but were also amplified by trade in volatility-related financial products, cf. Box 1. Trade in such products may have amplified the fluctuations in the VIX index itself in connection with the

February episode, as issuers in the market for derivative products needed to hedge their risks when the VIX rose. The VIX rose substantially more than the historical link between the S&P 500 and VIX indices would imply, which could indicate self-reinforcing effects, cf. Chart 5.

Furthermore, the adjustment in the VIX market may have itself reverberated on the equity markets, as investors are also able to hedge exposures in VIX futures via purchase/sale of S&P 500 futures or options.

The turmoil in the equity market did not spread to the bond market

Market developments in early February show how synthetic and leveraged products can create and amplify market fluctuations even though the market itself is small.² If turmoil erupts in the international financial markets, this is highly likely to affect markets in Denmark too.

The market correction came after a long period of historically low volatility in the markets, and the changes in the S&P 500 and volatility have subsequently reversed to some extent. Furthermore, the

² The total VIX-ETP market is estimated at approximately 8 billion dollars, based on the value of the largest VIX-ETPs.

The market for VIX-related financial products

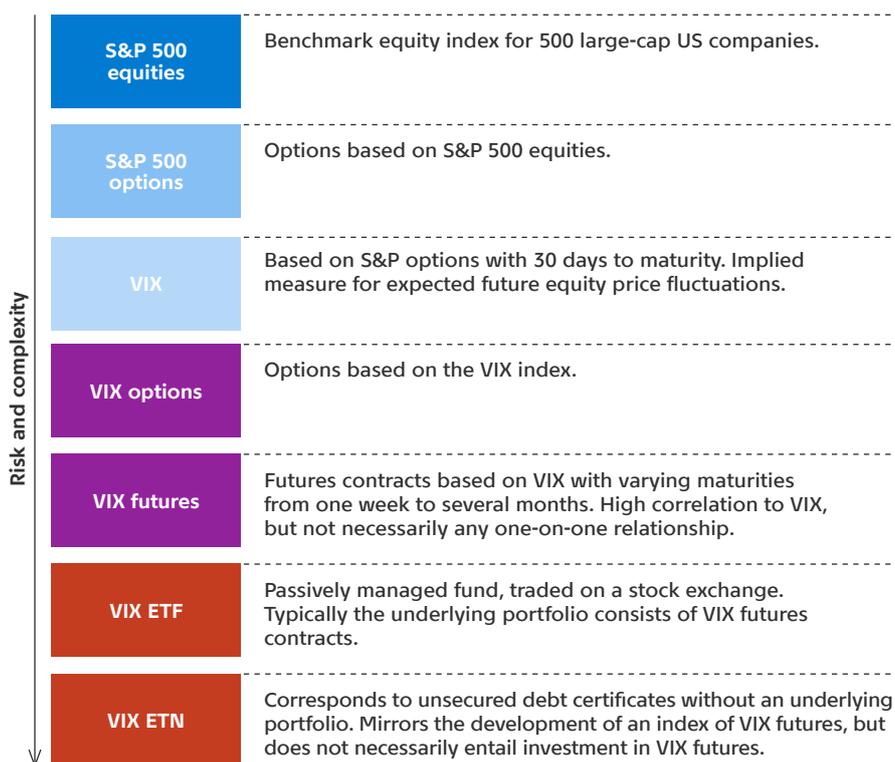
Box 1

A number of products traded in the financial markets are directly or indirectly related to the development in the VIX, cf. the Chart. The further you get into the product hierarchy, the more complex the products become. Since these products are multi-layer derivatives which may also be leveraged to different extents, fluctuations in both equity prices and volatility may have a strong impact on the market value of the products. Interconnection of the markets for options, futures contracts and exchange traded products, ETPs, may also have self-reinforcing effects.

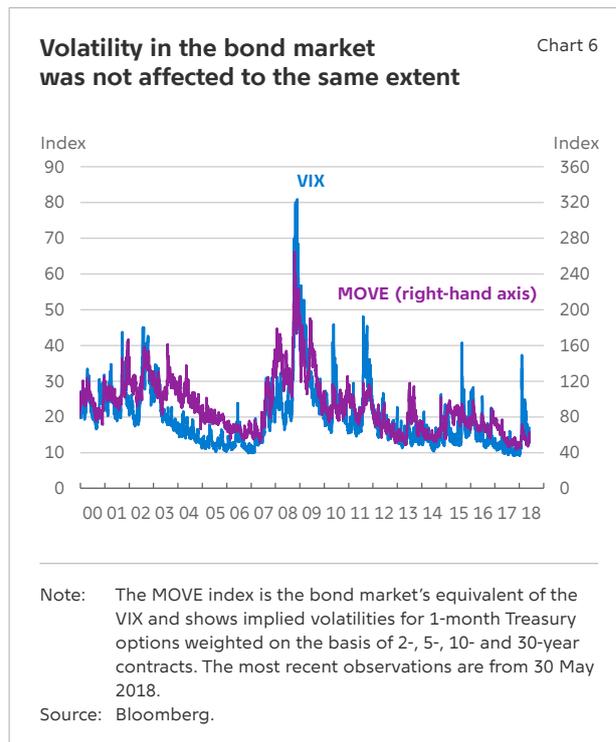
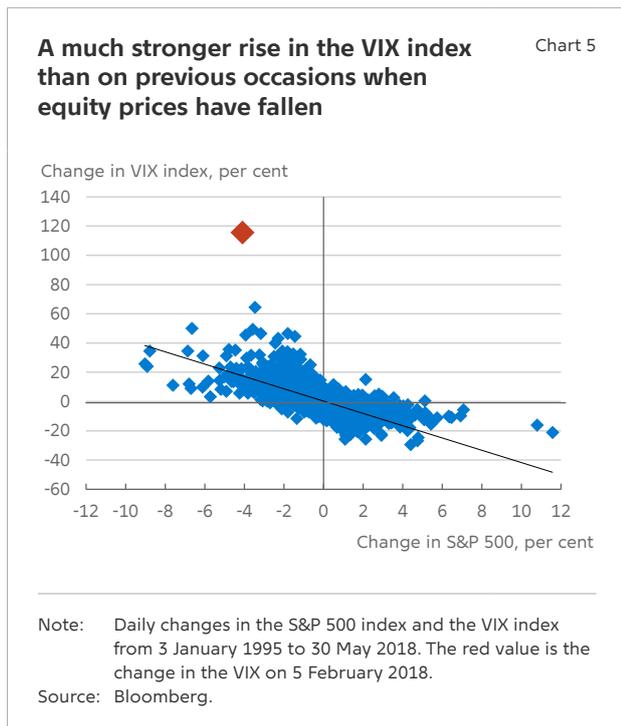
The VIX index is calculated on the basis of prices for S&P 500 options traded on the Chicago Board of Exchange, CBOE, and allow investors to speculate in the future development of the S&P 500 stock index. While the VIX index itself cannot be traded, the CBOE introduced trade in VIX-based futures

in 2004 and options in 2006. The long period of historically low volatility has made special trading strategies, based on continued low implied volatility, popular. These trading strategies may entail trade in both S&P 500 options and futures, as well as trade in VIX options and futures.

The post-crisis period has seen the introduction of trade in the above-mentioned ETPs, which are to varying degrees based on VIX futures, including Exchange Traded Funds, ETFs, and Exchange Traded Notes, ETNs. ETFs are funds managing a portfolio consisting of VIX futures. ETNs are uncollateralised debt certificates issued by a bank that follow the development in an index of VIX futures. Especially the ETPs have been attracting the attention of media and supervisory authorities in connection with the large market fluctuations in early February 2018.



Source: CBOE and US Industry Regulatory Authority, finra.org.



turmoil did not spread to other markets such as the bond market, cf. Chart 6. During other episodes of violent stress in the financial markets, credit spreads for corporate bonds and volatility in the bond markets have typically also been affected.

The reduction of the repo market seems to be driven by demand

Falling volumes of repo loans and deposits between Danish counterparties

The repo market plays a key role in relation to liquidity in the financial markets. The use of repo transactions allows market participants to place liquid funds, obtain short-term funding or gain access to collateral. In some situations, repo transactions may increase the vulnerability of the financial system. These transactions are typically short-term agreements and must be rolled over frequently to ensure long-term funding. Repo transactions may also be used to leverage the balance sheet of a credit institution. Refinancing risk and excessive leverage are precisely some of the risks that international legislation has sought to address in the wake of the latest financial crisis. As new regulation has been implemented in recent years, it has been discussed

internationally whether parts of this regulation may have affected the functionality of the repo markets. One concern is that the banks have reduced their supplies of repo loans too much.

In Denmark, repo lending by credit institutions fell by almost kr. 80 billion from October 2013 to January 2018, cf. Chart 7.

New regulation does not limit repo lending in Denmark

As regards the regulatory initiatives that may have affected the repo market, focus, both internationally and in Denmark, has been on the leverage ratio, the Liquidity Coverage Ratio, LCR, and the Net Stable Funding Ratio³, NSFR, cf. Box 2.

Credit institutions that are active in the Danish repo market report all key figures for leverage ratio and LCR. The institutions must observe an LCR of 100 per cent, while the future leverage ratio requirement is 3 per cent. On the basis of this reporting, it has been concluded that there is ample extra capacity to increase total repo lending without the statutory

³ The NSFR is still to be finalised by the EU so it has not been taken into account in the calculations.

Regulation and repo lending

Box 2

The **leverage ratio** may contribute to reducing the banks' incentive to conclude repo transactions. This is because the ratio is calculated relative to unweighted exposures, unlike the risk-weighted capital requirements. Repo transactions, which are collateralised loans, have low risk weights, which mean that they are more capital intensive under the leverage ratio requirement than under the risk-weighted requirement. So a binding leverage ratio may affect the institutions' use of repo transactions.

The **Liquidity Coverage Ratio, LCR**, is a requirement for credit institutions to hold sufficient liquid assets to withstand 30 days of severe liquidity stress. If the maturity of the repo loan is more than 30 days, the loan cannot be included in the portfolio of liquid assets. As the LCR rules lay down specific requirements for the volume of highly liquid assets, banks may have an incentive to reduce repo lending with maturities of more than 30 days.

requirements becoming binding, even if a certain buffer to the requirements is taken into account, cf. Chart 8.

The estimated capacity fluctuates over time but shows that in March 2018 there was scope to increase repo lending for the sector by a further kr. 114 billion. At the lowest level, the extra capacity exceeds kr. 90 billion. In fact, the extra capacity exceeds the total fall in repo lending since 2013. Hence, the credit institutions' capacity to provide repo lending is not assessed to be limited at present.

Current market conditions give banks less incentive for repo financing

The reduction in repo financing has been most pronounced among credit institutions, which today borrow only one third of the October 2013 volume in the repo market, cf. Chart 9. The insurance and pension sector has also reduced its repo loans, except in a period in 2015-16 when the sector increased its repo balance sheets considerably. Alternative financial intermediaries, including e.g. hedge funds, have practically not changed their level of repo financing over this period and are now the largest loan takers in the market.

A falling volume of repo lending in Denmark

Chart 7

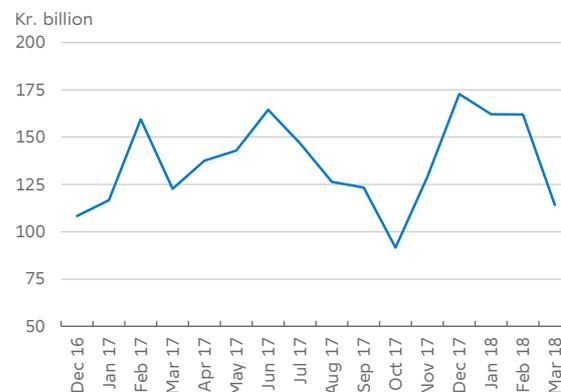


Note: Repo lending comprises repo transactions and securities lending etc. between Danish credit institutions and counterparties. Intragroup transactions have been left out. The most recent observations are from end-April 2018.

Source: Danmarks Nationalbank.

Considerable extra capacity in the Danish repo market

Chart 8



Note: It has been assumed that the banks will meet a minimum LCR of 110 per cent and a minimum leverage ratio of 4 per cent. The estimate has been calculated on the basis of the banks' reporting and takes into account the diversification rules, including statutory limitations in LCR, caps, and use of own bonds as collateral. That implies the largest possible effect from repo lending on LCR. The most recent observation is from end-March 2018.

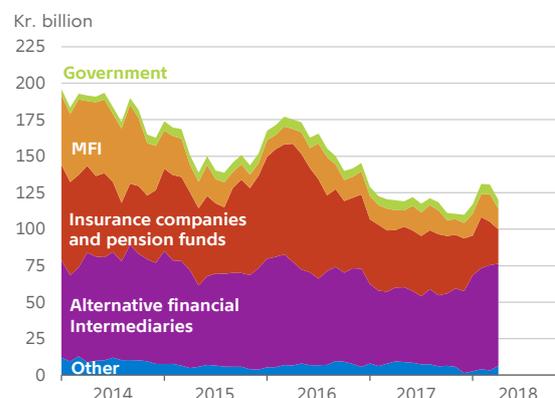
Source: Danish Financial Supervisory Authority and own calculations.

The fall in the credit institutions' repo deposits came at the turn of the year 2014/15 and continued in early 2015. That was the period when Danmarks Nationalbank reduced the rate of interest on certificates of deposit to -0.75 per cent and intervened in the foreign exchange market in response to a strengthening trend for the Danish krone. These interventions caused the banks' net position at Danmarks Nationalbank to rise substantially. Combined with non-residents' strong demand for assets in kroner, the banks' marginal placement opportunity was primarily certificates of deposit. In such a situation, the banks have an incentive to reduce repo deposits as the net interest from borrowing in the repo market and investing the funds in certificates of deposit is negative.

Since mid-2016, the net position has been back at the 2013 level, while the rate of interest on certificates of deposit has been -0.65 per cent since the beginning of 2016. Yields on short-term mortgage bonds and government bonds have both fallen to almost the same level. So at present the banks' marginal placement yield is close to the rate of interest on certificates of deposit, cf. Chart 10. This may be part of the explanation for the banks' current lower demand for short-term repo financing.

It is primarily the credit institutions that have reduced their repo financing

Chart 9

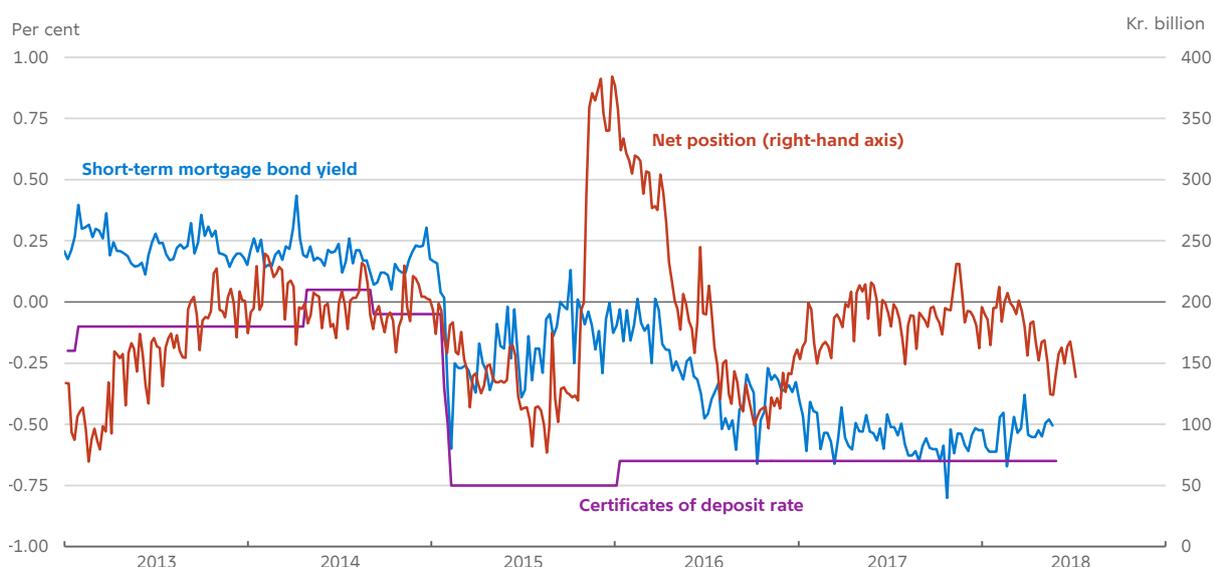


Note: Repo lending by Danish credit institutions to domestic sectors. The most recent observations are from end-April 2018.

Source: Danmarks Nationalbank.

There is a link between the banks' marginal placement yield and the volume of repo financing

Chart 10



Note: The short-term mortgage bond yield is the effective yield to maturity on non-callable short-term Danish bullets. The net position indicates the Danish monetary policy counterparties' total net deposits at Danmarks Nationalbank. The most recent observation is 21 May 2018 for the mortgage bond yield and 28 May 2018 for the net position and the certificates of deposit rate.

Source: Finance Denmark and Danmarks Nationalbank.

The insurance and pension sector's use of refinancing depends on the investment opportunities

The insurance and pension sector needs repo financing to fund its leveraged investments in e.g. Danish mortgage bonds. So the financing requirement will depend on the investment opportunities. In 2015-16, the sector's repo financing increased considerably. Over the same period, the option-adjusted yield for mortgage bonds rose to more than 10 basis points, cf. Chart 11. This indicates that the sector uses repo financing in periods when the yield on mortgage bonds is above a certain level. This link also points to the fall in repo lending since 2013 having been driven by demand. So the lower level of repo lending seems to reflect market conditions rather than increased difficulty in procuring liquidity in the repo market.

The earnings of the systemic credit institutions continue to increase

Loan impairment charges now make a positive contribution to profits

Continuing the upward trend in earnings seen in recent years, the systemic credit institutions posted record-high financial results for the second year in a row, cf. Chart 12. Reversal of loan impairment charges and large value adjustments boosted profits. If these income items are disregarded, earnings fell slightly in 2017. The financial statements for the 1st quarter of 2018 continued to show robust results. All the same, earnings were a little lower than in the same quarter of the preceding year, primarily due to large value adjustments in 2017.

The banks' loan impairment charges for the year can be broken down by reversals and new impairment charges, cf. Chart 13. 2017 was the first post-crisis year in which reversals exceeded new impairment charges. Over the last few years, the volume of reversals has been more or less constant so the fall in current loan impairment charges reflects a decline in new impairment charges.

The low level of new loan impairment charges primarily reflects an improved cyclical position. As regards transactions with retail customers, net reversals totalled just over kr. 700 million in 2017, cf. Chart 14. For corporate customers, the largest net reversals were seen in the real estate sector.

Repo financing increases in periods of high mortgage bond yields

Chart 11

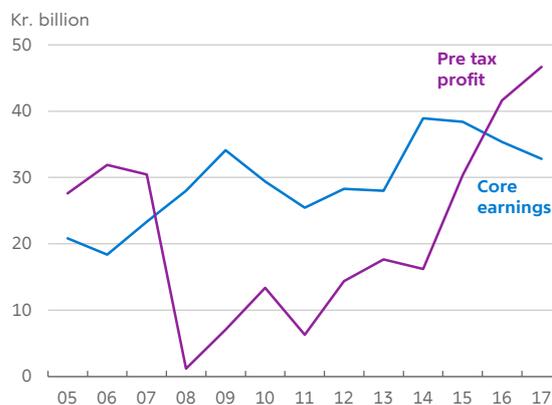


Note: The Nykredit Danish Mortgage Bond Index is calculated on the basis of a portfolio composed of the most liquid listed mortgage bonds. The grey area indicates the period during which the insurance and pension sector increased its repo financing. The most recent observations are from 29 May 2018.

Source: Nykredit Danish Mortgage Bond Index and Danmarks Nationalbank.

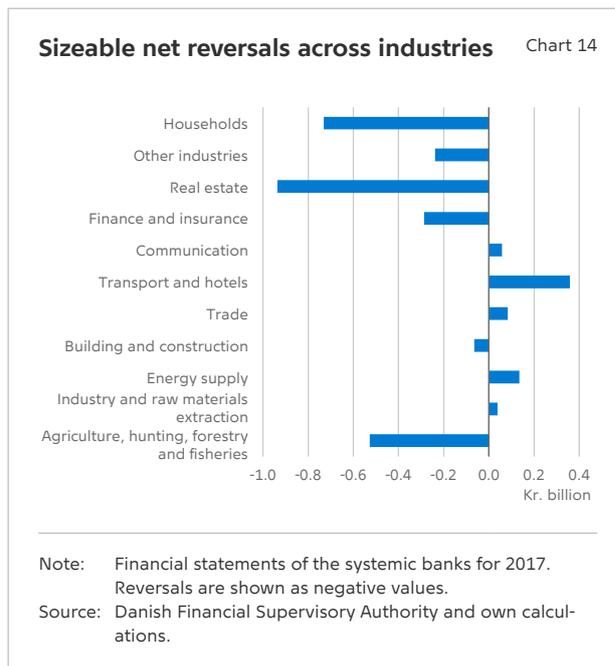
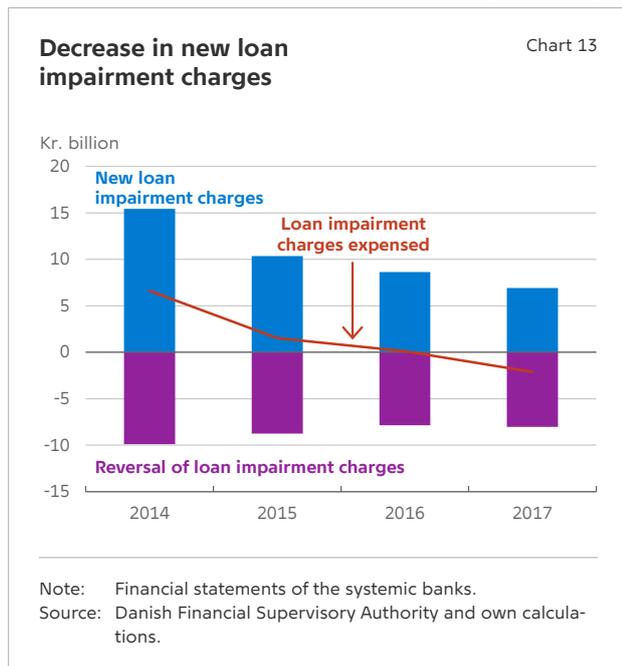
High earnings among the systemic credit institutions

Chart 12



Note: Financial statements of the systemic credit institutions. Core earnings have been defined as profit before tax adjusted for goodwill less value adjustments, loan impairment charges and income from investments.

Source: Danish Financial Supervisory Authority and own calculations.



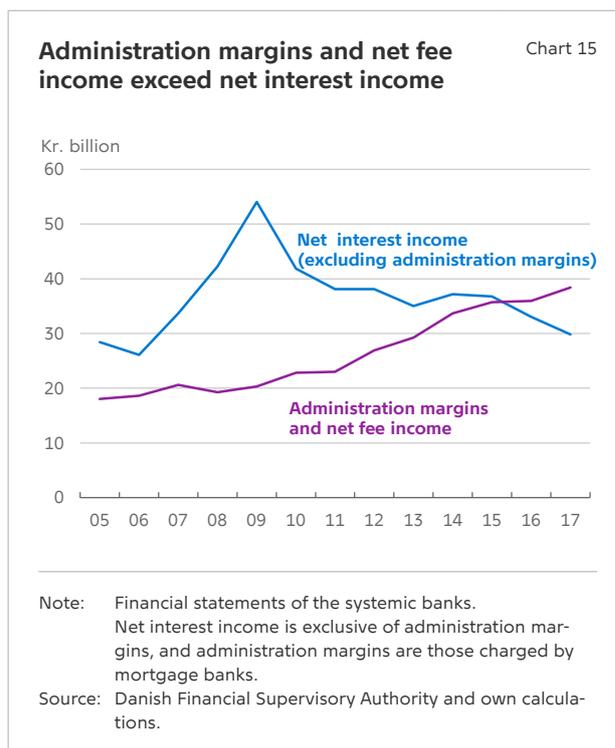
Income from administration margins and net fees exceeds net interest income

Net interest income is still being squeezed by the low level of interest rates and was just over kr. 3.1 billion lower in 2017 than in 2016, cf. Chart 15. The systemic credit institutions have compensated for this by increasing income from fees and administration margins, which has exceeded net interest income since 2016.

The reason for the low net interest income is that interest rates remain low and this puts the banks' interest margins under pressure. Since 2014, the interest margin across the large and medium-sized banks has fallen by 1 percentage point for the corporate sector and 0.7 percentage point for retail customers, cf. Chart 16.

Banks increasingly operate with negative interest rates for corporate deposits

To reduce the fall in net interest income, some banks began to charge interest on corporate deposits in 2015, and since then others have followed suit. According to Danmarks Nationalbank's semi-annual survey of the banks' use of negative interest rates, the share of corporate deposits which earned negative interest had risen to 53 per cent in September 2017, while only 10 per cent earned positive interest, cf. Chart 17. The most recently reported data for average deposit rates indicates that this tendency continues, so that most of the



The banks' interest margins are still narrowing

Chart 16



Note: The interest rate margins have been calculated as the difference between deposit and lending rates for retail and corporate customers, respectively, for large and medium-sized banks. The most recent observations are from end-April 2018.

Source: Danmarks Nationalbank.

large and medium-sized banks now charge interest on corporate deposits.

Return on equity is high

The average return on equity for the systemic credit institutions continued to rise in 2017 and reached 11.2 per cent, up from 10.4 per cent in the preceding year. Especially value adjustments boost the return. If income from positive value adjustments is disregarded, the return on equity was 8.8 per cent. In view of the very low interest rates, the return on equity, even without the extraordinary contribution from value adjustments, is high, cf. Chart 18.

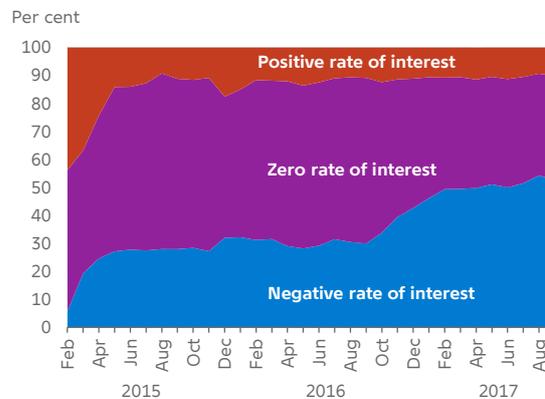
Increased use of internal models has contributed to lower risk weights

Slight improvement in the systemic credit institutions' capitalisation

The systemic credit institutions all observe their own capital targets and have excess capital adequacy relative to the fully phased-in capital requirements in the Capital Requirements Regulation, CRR, so that they are able to withstand considerable financial stress without falling below the minimum requirements.

A rising share of corporate deposits earn negative interest

Chart 17

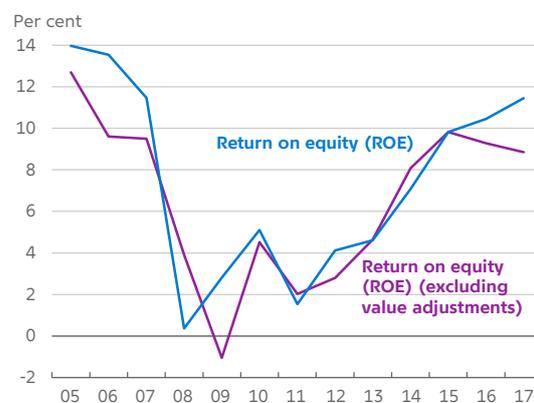


Note: Breakdown of corporate bank deposits by those earning negative, zero and positive interest, respectively. The most recent observations are from September 2017.

Source: Danmarks Nationalbank.

Return on equity has increased

Chart 18



Note: Return on equity has been adjusted for goodwill impairment charges. Data for systemic credit institutions.

Source: Danish Financial Supervisory Authority and own calculations.

Combined with lower risk weights, the high earnings in 2017 meant that most of the systemic credit institutions were able to improve their Common Equity Tier 1 ratios slightly – despite large-scale equity buy-backs and provisions for expected dividends, cf. Chart 19.

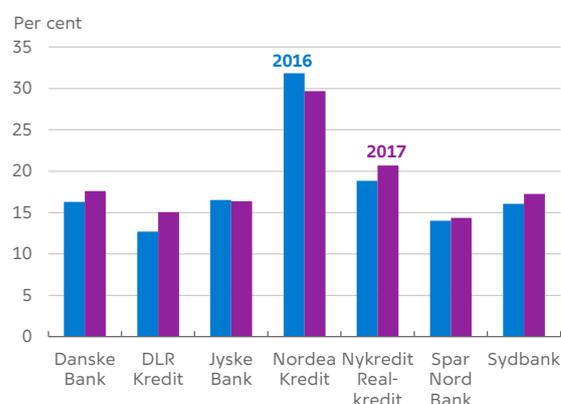
Since 2014, the level of Common Equity Tier 1 capital in the systemic credit institutions has increased by 9 per cent overall, while risk-weighted exposures have been reduced by 9 per cent. This has resulted in an average (weighted) increase in the institutions' Common Equity Tier 1 ratio of approximately 3 percentage points.

During the same period, the institutions' total balance sheet has increased marginally by around 0.3 per cent. The combination of declining risk-weighted exposures and a marginally increasing balance sheet means that average risk weights have fallen considerably, cf. Chart 20. This is attributable to several factors, including increased use of internal models.

The general improvement of the Danish housing market has not led to a marked shift in the level of risk weights for housing loans. For the largest Danish credit institutions, average risk weights for retail loans secured by real estate property are more or less stable at 13-18 per cent. However, the Danish Financial Supervisory Authority has noted that some institutions apply disproportionately low risk weights in the growth areas in and around Copenhagen and in Aarhus. Consequently, the Authority has emphasised that the average risk weight for Danish retail loans secured by real estate property should be at least 10 per cent. The Authority expects the institutions to keep up this minimum level, irrespective of the cyclical position, both for the overall portfolio and for significant sub-portfolios. For an institution with a target Common Equity Tier 1 ratio of e.g. 15 per cent, the announced expected minimum requirement for the average risk weight means that when kr. 100 is lent, at least kr. 1.5 must be financed via equity capital.

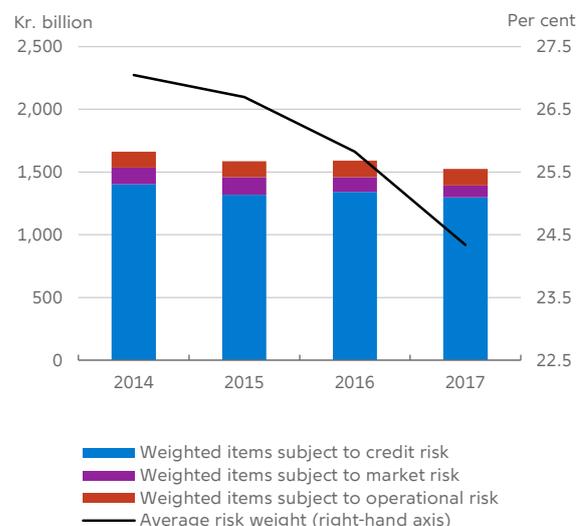
The level of the average risk weights for retail loans secured by real estate property in the largest Danish institutions remains more than twice as high as that of the largest Swedish institutions, cf. Chart 21. When comparing the capital ratios of Danish and Swedish institutions, it should be taken into account that the very low risk weights for Swedish housing loans can make the Swedish institutions appear to be

Slight improvement of Common Equity Tier 1 ratio among most systemic credit institutions Chart 19



Source: Danish Financial Supervisory Authority.

Fall in risk-weighted exposures Chart 20



Note: Based on data for systemic credit institutions. The average risk weight has been calculated as total risk-weighted exposures as a percentage of total assets, guarantees and irrevocable credit commitments. Total assets are exclusive of insurance activities, which are not comprised by the CRR consolidation.

Source: Danish Financial Supervisory Authority and own calculations.

better capitalised than the Danish ones.⁴ But if the unweighted capital measure, the leverage ratio, is considered instead, the capitalisation of the largest Danish banks is closer to that of their Swedish equivalents, cf. Chart 22. All the same, the capitalisation of Danske Bank and Nykredit Realkredit is still lower than that of Nordea, SEB, Swedbank and the Norwegian bank DNB.

The largest banks are close to buffer requirements in a severe recession

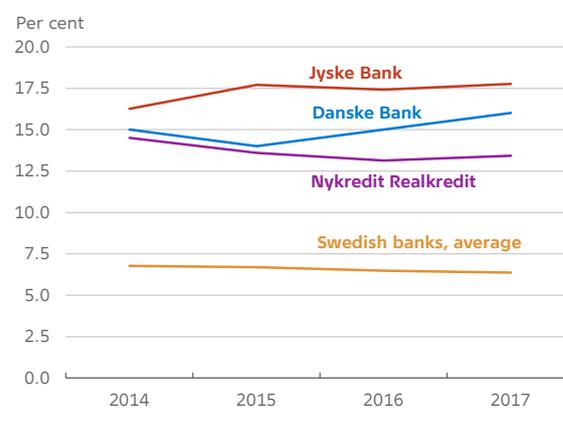
Danmarks Nationalbank's accounts-based stress test assesses the institutions' excess capital adequacy over the next three years under three different macroeconomic scenarios.⁵ The systemic credit institutions have sufficient capital to withstand a severe recession scenario, but several are close to exceeding the capital buffer requirements.

The mortgage credit activities of the credit institutions are now included in Danmarks Nationalbank's stress test. This means that it is possible to perform stress tests at group level, not only at bank level as previously. The stress test shows that the credit institutions are generally robust to even considerable loan impairment charges for mortgage loans. Given their high earnings from administration margins, the mortgage banks post mostly positive results, even in a stress scenario, but the stress test also shows that risk weights can increase by up to 25 per cent.

Several of the small, non-systemic banks are challenged in the stress test, and some may have difficulty meeting the minimum capital requirement. Before the non-systemic banks hit the minimum requirement, breach of the buffer requirements will allow the authorities to intervene. If the solution is recovery or resolution, the authorities have the tools required to address such a situation, but the owners

Average risk weights for housing loans remain substantially higher than in Swedish banks

Chart 21



Note: Average risk weights using the internal ratings-based approaches for retail lending secured by real estate property. Nordea Kredit has not been included as it did not publish risk reports before 2017.

Source: Own calculations based on risk reports.

and creditors of the banks in question may suffer losses.

The countercyclical buffer has now been activated

On the basis of a recommendation from the Systemic Risk Council, the Minister for Industry, Business and Financial Affairs in March 2018 decided to set a countercyclical capital buffer rate for exposures in Denmark of 0.5 percentage point with effect from 31 March 2019. The Council has also indicated that it expects to recommend a further increase of the buffer rate during 2018 if risk continues to build up at the current rate.

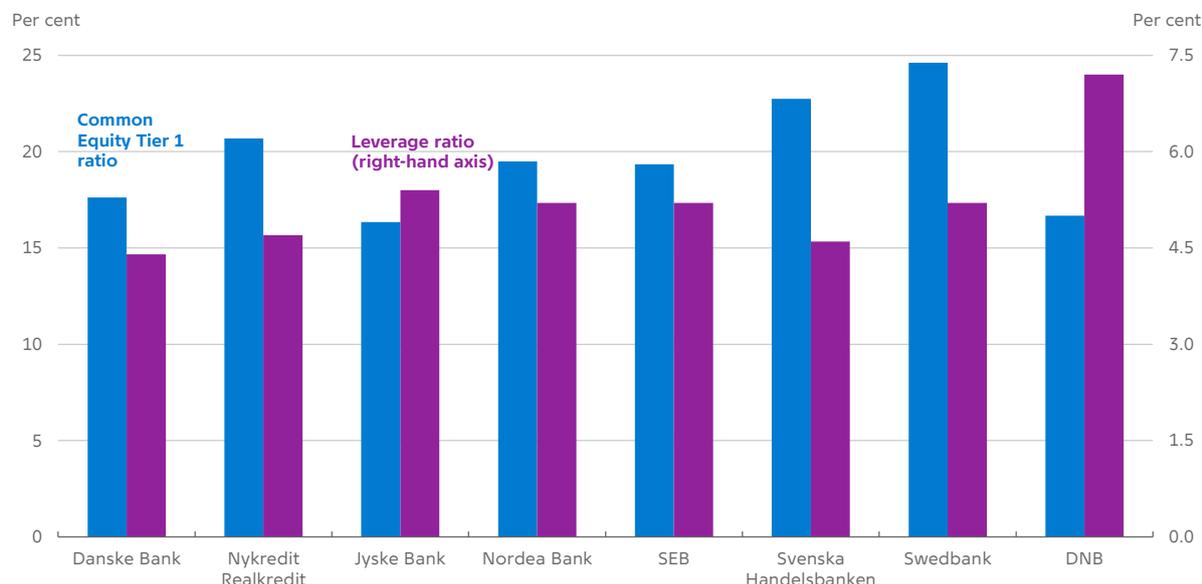
The countercyclical capital buffer differs from other capital requirements in that it varies with the development in systemic risks. The buffer is to be used

4 The Swedish Financial Supervisory Authority, Finansinspektionen, has set a floor of 25 per cent for risk weights on Swedish housing loans. This floor has been implemented under Pillar 2 and is therefore of no consequence to the size of the risk-weighted exposures. In April 2018, Finansinspektionen proposed replacing the current Pillar 2 floor by a capital requirement under Pillar 1 in accordance with article 458 of the CRR. This will reduce the published capital ratios as the risk-weighted exposures will rise.

5 The three stress scenarios and the results of the stress test are described in more detail in Danmarks Nationalbank, *The largest banks are close to buffer requirements in stress test*, Danmarks Nationalbank Analysis (Stress Test), No. 5, May 2018. ([link](#))

Large differences in capitalisation according to weighted and unweighted capitalisation measures

Chart 22



Note: Common Equity Tier 1, CET1, capital as a percentage of risk-weighted exposures. The leverage ratio is calculated as Tier 1 capital as a percentage of unweighted exposures, i.e. total assets with certain adjustments regarding derivative and repo transactions and off-balance-sheet exposures.

Source: SNL Financial and risk reports.

to counter a negative impact on the real economy when the financial system is stressed. In that situation the buffer must be released. This helps the banks to maintain a suitable level of lending in periods of stress in the system.

With the current excess Common Equity Tier 1 capital, the systemic credit institutions already comply with the countercyclical buffer requirement – even at a higher rate than 0.5 percentage point. So activation of the buffer does not lead to an instant need to inject further capital, but helps to ensure that the institutions have sufficient excess capital adequacy relative to the minimum capital requirements. A buffer of 0.5 percentage point is a very modest counterweight to the potential losses and rising risk weights during an economic downturn, so it is important that the buffer rate is increased if risk continues to build up.

Institutions should consider preparing for new Basel requirements

In December 2017, the Basel Committee published a reform package known as the completion of Basel III. The package supplements the measures that were part of the original Basel III reform from 2010 and comprises, inter alia:

- new, improved standard approaches to calculating risk-weighted exposures for credit risk, credit value adjustments, CVA, and operational risk
- limitation of the use of internal models and introduction of “input floors” for the PD, LGD and EAD parameters when calculating IRB risk weights for credit risk
- introduction of an output floor for total risk-weighted exposures.

Calculations made by a group of experts appointed by the Minister for Industry, Business and Financial Affairs in February 2017 show that, overall, the completion of Basel III will cause the capital requirement for the largest Danish credit institutions to rise by around kr. 78 billion.⁶ Measured relative to the risk-weighted exposures, this corresponds to an average increase of 5.5 percentage points in the institutions' capital requirements. The output floor is by far the most significant reason for this increase.

The Basel Committee envisages that the reform package will enter into force on 1 January 2022, with phasing-in of the output floor from 2022 to 2027. The package must be adopted by the EU before it applies to Danish institutions. However, it is important that the institutions already begin to consider whether they need to adapt to the new requirements in connection with their capital planning for the coming years.

High liquidity in the financial sector

The banks comply with the LCR requirement

Danish banks comply with the short-term Liquidity Coverage Ratio, LCR, with a certain margin, cf. Chart 23. The excess capital adequacy helps to protect the banks against unforeseen liquidity needs. The LCR is to ensure that the banks have adequate high-quality liquid assets to cover a 30-day intensive liquidity stress scenario. The banks' LCR varies over time due to changes in the portfolio of liquid assets and/or changes in cash flows.

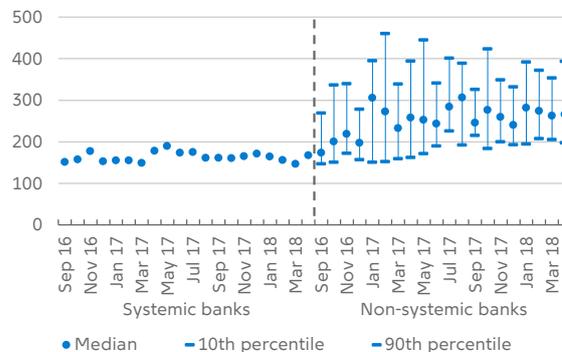
The liquidity buffer primarily consists of highly liquid assets

The LCR liquidity buffer may consist of a number of liquid assets, cf. Chart 24. Danish banks primarily hold central bank deposits and certificates of deposit as well as covered bonds in their liquidity buffers.

Banks comply with the LCR

Chart 23

Banks' liquid funds as a percentage of net outflows



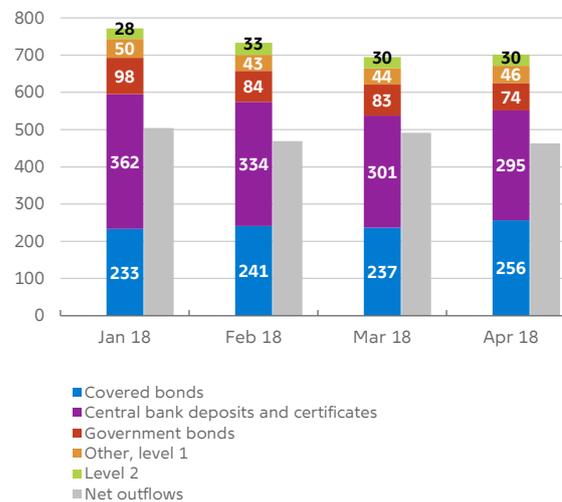
Note: The banks must comply with a minimum liquidity coverage ratio, LCR, of 100 per cent. The banks switched to new LCR reporting forms in September 2016, which is why the time series begins then. The most recent observations are from April 2018.

Source: Danmarks Nationalbank.

Covered bonds and central bank assets fully cover 30 days' net outflows

Chart 24

Liquidity buffer and net outflows, kr. billion



Note: The total liquidity buffer and net outflows of systemic and non-systemic banks. Net outflows have been calculated on the basis of LCR reports. The most recent observations are from April 2018.

Source: Danmarks Nationalbank.

⁶ The calculations are based on data for Danske Bank, Nykredit Realkredit, Jyske Bank, Nordea Kredit and Sydbank as at 30 September 2016. It has been assumed that the institutions' Pillar 2 requirements are unchanged in nominal terms. See Ministry of Business, Industry and Financial Affairs, Effekter af Baselkomitéens anbefalinger om kapitalkrav til kreditinstitutter (Effects of the Basel Committee's recommendations on capital requirements for credit institutions – in Danish only), February 2018.

Hence, net outflows are fully covered by highly liquid assets, which contributes to the robustness of the banks' liquidity reserves.

Systemic institutions must comply with an LCR currency requirement

To ensure healthy liquidity management, it is also important that there is no mismatch between the individual institution's assets and liabilities in the same currency. Consequently, Danish systemic credit institutions must comply with LCR requirements in the currencies that are significant for the individual institution. A currency is significant if the institution's total commitments in that currency constitute 5 per cent or more of its total liabilities. Swedish kronor and Norwegian kroner are exempt from the foreign exchange LCR requirement. In the 1st quarter of 2018, all institutions complied with the LCR currency requirement.

Adjustment of the liquidity buffer for repo transactions

The LCR requirement is to ensure that credit institutions have an adequate buffer of liquid assets to cover their commitments in the next 30 days. Therefore, the LCR regulatory framework includes a requirement that the portfolio must be adjusted for assets that will be provided or received during the next 30-day period, for instance in the form of repo deposits and lending, cf. Box 3.

However, this adjustment could entail that the actual level of liquid assets is not reflected in the LCR calculation, given that the portfolio increases if the bank holds a larger volume of repo lending than of repo deposits.

Several Danish banks increase their portfolios of highly liquid assets, level 1A assets, by providing

Adjustment of the liquidity buffer for repo deposits and lending

Box 3

The liquidity buffer must be diversified and robust. Accordingly, the LCR regulatory framework includes a requirement that at least 30 per cent of the buffer must consist of highly liquid assets such as central bank deposits or government bonds, "level 1A assets".

In the calculation of level 1A assets, the banks must adjust for liquidity borrowed through repo deposits or lent through repo lending¹.

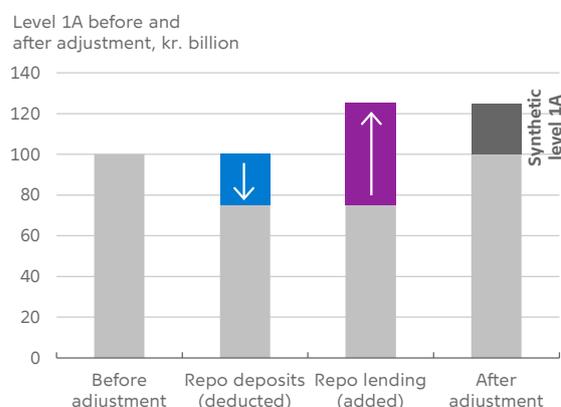
This means that when a bank has received liquidity against collateral and will receive the collateral back at an agreed time, the liquidity must be deducted from the liquidity buffer. The reason is that, in effect, the liquidity has been pledged to a counterparty and is thus not at the disposal of the bank. For instance, a bank with a liquidity buffer of 100 level 1A assets which has a repo deposit of 25 has an adjusted portfolio of 75 level 1A assets, cf. the chart.

The opposite is true for repo lending in which the bank has provided a loan against collateral, for instance by buying a bond which is sold back to the counterparty at an agreed time. In that case, a bank with a liquidity buffer of 100 level 1A assets which provided a repo loan of 25 has an adjusted portfolio of 125 level 1A assets.

Due to the adjustment, a bank may have a lower or higher volume of level 1A assets than the bank actually has on its balance sheet. This means that the correction results

in a *synthetic* level 1A portfolio that is positive if the bank provides more repo loans than it receives repo deposits.

The adjusted portfolio determines whether the minimum requirement of 30 per cent level 1A assets in the buffer has been complied with. If the institution has too few level 1A assets, this restricts the number of other assets that may be included. If the level 1A assets are increased, the volume of other assets that can be included in the liquidity buffer may thus be increased. For instance, if the institution has 30 level 1A assets after adjustment for repo deposits and lending, 70 other assets may be included, while any excess assets cannot be included.



¹ Repo deposits entail receiving liquidity against collateral, while repo lending entails provision of loans against collateral. The examples assume that the transactions mature within 30 days and are thus included in the LCR calculation.

repo lending, whereby the bank provides loans against collateral. A few banks more than doubled their portfolios of level 1A assets through repo lending in most of 2017, cf. Chart 25. While this is in full compliance with the LCR regulations, it generally results in a less robust liquidity buffer than if the banks had instead held the liquidity provided through repo lending themselves or had held government bonds. If a bank's counterparty is unable to repay the collateralised loan, the bank is left with e.g. less liquid bonds or its own bonds. In a situation, where the bank in question or the market as a whole is under stress, this could present a potential liquidity risk.

Liquidity monitoring is more than LCR

The LCR time horizon is 30 days. This means that it is not disclosed whether the institutions are faced with large maturities on individual days within the 30-day period – maturities that would be difficult to cover in a crisis. From the 1st quarter of 2018, the institutions report the maturity dates of payments. This will enable the authorities to assess more precisely when an institution will need liquidity to settle its payments.

Proposed amendments to the LCR

In January 2018, the European Commission presented draft legislation to amend the rules for calculating the LCR. As it appears from Danmarks Nationalbank's comments on the draft delegated act⁷, Danmarks Nationalbank supports the amendments which solve the unwind problem for repos with central banks in a systemic crisis. As described, the framework for repo deposits and lending in the calculation of the LCR, including the adjustment of level 1A assets, may have unintended consequences.

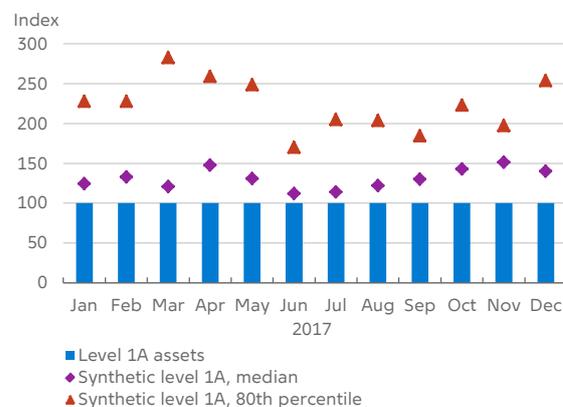
Strong pressure to ease credit standards in the banking sector

Mortgage lending continues to drive lending growth

Lending to Danish households and firms by large and medium-sized credit institutions has continued to increase over the past year, cf. Chart 26. Favourable developments in the financial sector in recent

Adjustment for repo deposits and lending has significance for the calculation of level 1A

Chart 25

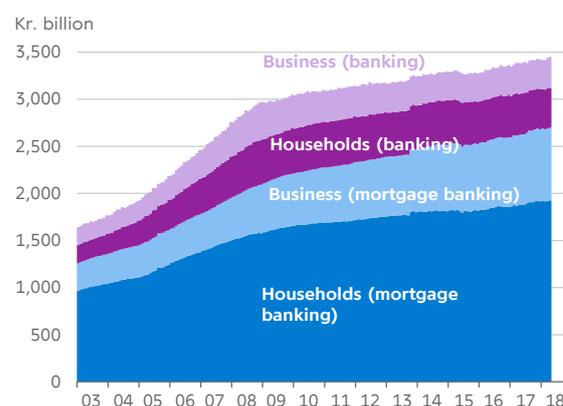


Note: The monthly portfolio of level 1A assets before adjustment (indexed to 100) and the portfolio of level 1A assets resulting from repo deposits and lending relative to level 1A before adjustment for the median and 80th percentile, respectively. For these purposes, level 1A after adjustment is designated as synthetic. Data for systemically important institutions.

Source: Danmarks Nationalbank and own calculations.

Increase in domestic lending is due to rising mortgage lending

Chart 26



Note: Lending to households and business by large and medium-sized banks and mortgage banks. The self-employed are included in the "households" sector. The most recent observations are from end-April 2018.

Source: Danmarks Nationalbank and own calculations.

7 Danmarks Nationalbank, Comments on the Draft Delegated Act Amending the Commission Delegated Regulation on the Liquidity Coverage Ratio (LCR). ([link](#))

years mean that banks generally have significant capacity to increase lending. Combined with increasing, but limited, growth in demand for loans, this has intensified competition for customers. Hence, there is a foundation for lowering the credit quality and easing credit conditions that is not reflected in total lending growth.

As a result of the gradual shift from bank loans to mortgage loans in recent years, mortgage lending continues to drive lending growth. There is a large spread in lending growth across the sector, cf. Chart 27, and growth tends to be particularly high among the medium-sized banks.

The medium-sized banks gain market shares in periods of high risk appetite

For a number of years, the large banks have overall reduced bank loans in favour of mortgage loans, including mortgage-like bank loans, which are to some extent transferred from the banks' to the mortgage banks' balance sheets. This helps to explain why the medium-sized banks are gaining market shares for household bank loans since 2014, cf. Chart 28. The market shares of medium-sized banks for corporate loans also increased in 2017 after having been stable for an extended period.

In the period up to the latest financial crisis, market shares of the medium-sized banks also rose amid economic growth and high risk appetite. Back then, some of the banks contributed to the pressure on credit standards and credit quality requirements in the market.

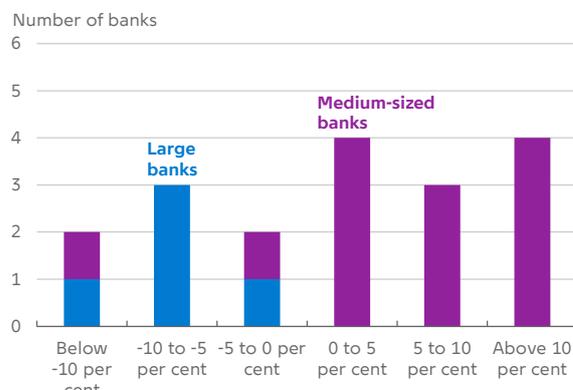
Signs of increased risk-taking for corporate customers

According to Danmarks Nationalbank's lending survey, the banks have been easing credit standards since 2014, cf. Chart 29. Medium-sized banks, in particular, have been easing credit standards for corporate customers. But the credit managers of the banks reported less easing of credit standards in 2017, and in the 1st quarter of 2018 credit standards remained unchanged. This should be seen in the context of medium-sized banks reporting continuous easing of credit standards for 14 consecutive quarters.

According to the survey, the credit managers of both medium-sized and large banks respond that the main reason for easing of credit standards is competitive pressure, cf. Chart 30. In the current environment of intense competition, it is essential that the

Considerable variation in banks' lending growth

Chart 27

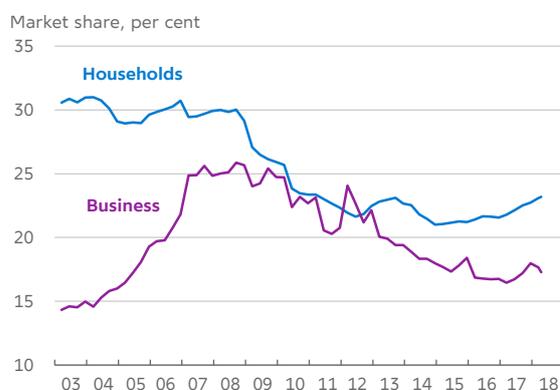


Note: The number of banks within each lending growth interval in 2017. Growth is based on banks' domestic lending to households and business.

Source: Danmarks Nationalbank and own calculations.

The medium-sized banks' market shares have started to increase

Chart 28

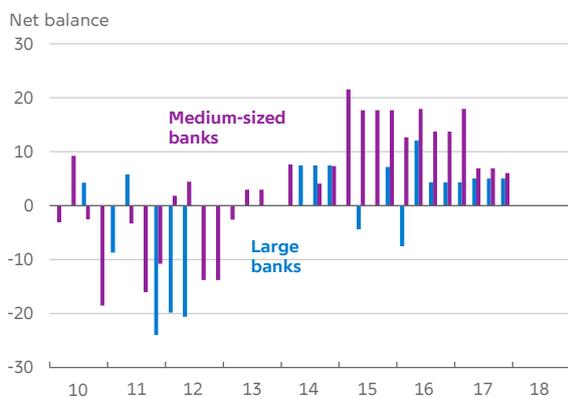


Note: Lending by medium-sized banks relative to total lending by large and medium-sized banks and foreign branches in Denmark. All banks included in the Danish Financial Supervisory Authorities' population of medium-sized bank at any point in time since 2013, are included in the chart. The most recent observations are from end-April 2018.

Source: Danmarks Nationalbank and own calculations.

Banks have been easing their credit standards since 2014

Chart 29

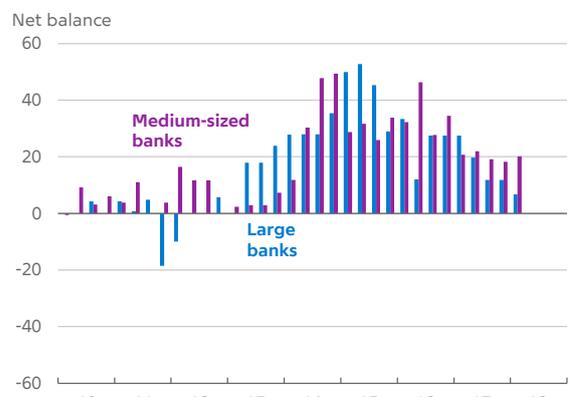


Note: The lending survey for corporate customers. The net balance lies within the interval -100 to 100. A positive (negative) net balance means that credit managers of the banks in question have, overall, i.e. lending-weighted, stated that they have eased (tightened) their standards relative to the preceding quarter. The most recent observations are from the 1st quarter of 2018.

Source: Danmarks Nationalbank.

Increasing pressure on credit standards from competitors

Chart 30



Note: The lending survey for corporate customers. The net balance lies within the interval -100 to 100. A positive (negative) net balance means that credit managers of the banks in question have, overall, i.e. lending-weighted, stated that they have eased (tightened) their standards relative to the preceding quarter. The most recent observations are from the 1st quarter of 2018.

Source: Danmarks Nationalbank.

banks continuously ensure solid credit quality. This reduces the risk that lending to new customers will lead to substantial losses when the economy reverses.

Problems in a medium-sized bank do not constitute a direct threat to financial stability, but it is essential to ensure that competitive pressure does not over time affect the risk appetite of the entire banking sector.

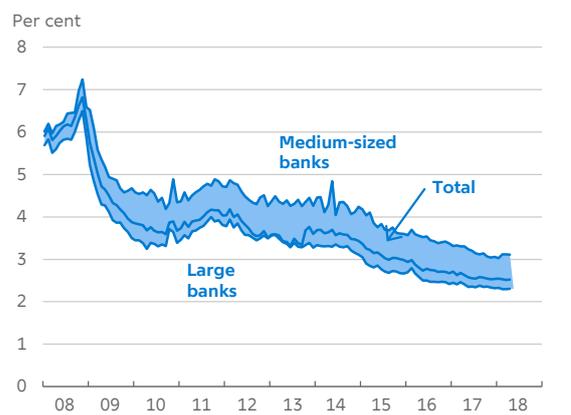
According to Danmarks Nationalbank's lending survey, medium-sized banks' easing of credit standards has been reflected mainly in a narrowing of margins. This is consistent with interest rate developments. While the banks' average interest rate on corporate loans has stabilised over the past year, the spread between the interest rates of medium-sized and large banks has narrowed, cf. Chart 31.

Growth in lending to corporate customers is concentrated on the cyclical industries

The increase in large and medium-sized banks' lending to the corporate sector has been limited, cf. Chart 32. There is considerable variation in the lending growth to different industries. Both large and medium-sized banks' lending to cyclical industries such as building and construction, trade and property trading and letting has risen since 2014.

Corporate interest rate spread between medium-sized and large banks has narrowed

Chart 31



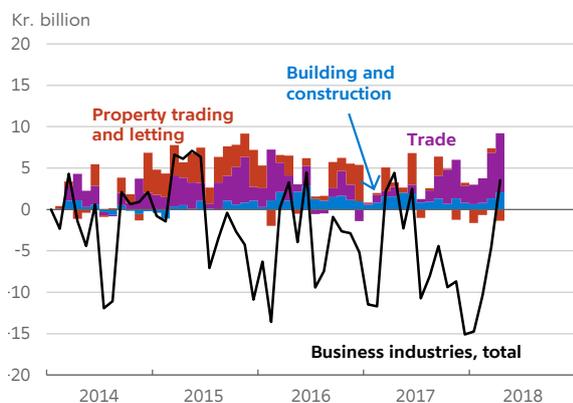
Note: The interest rate spread between medium-sized and large banks' lending reflects differences in the lenders' credit risks, but also other factors such as product structures. The most recent observations are from April 2018.

Source: Danmarks Nationalbank and own calculations.

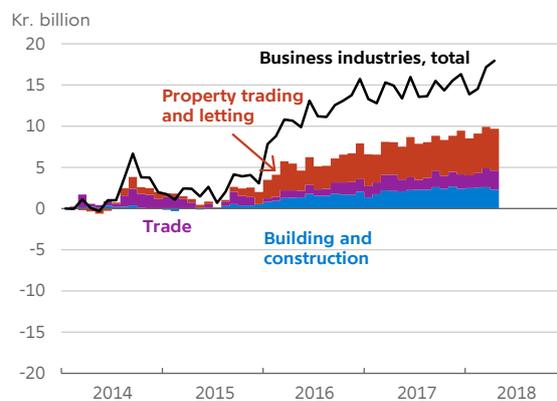
Lending to cyclical industries has increased

Figur 32

Large banks



Medium-sized banks



Note: Cumulative change in lending by large and medium-sized banks since start-2014. The category "Business industries, total" is the sum of all industries excluding "Financial and insurance activities", "Employees, etc." and "Public administration, defence and police". The most recent observations are from end-April 2018.

Source: Danmarks Nationalbank and own calculations.

In cyclical industries, firms' investment opportunities tend to improve as an upswing gains momentum, and hence their demand for bank loans will increase. That is a natural element of a period of economic growth. This also means that the banks should assess the financial robustness of loan applicants over the entire business cycle. Firms in cyclical industries have previously seen large fluctuations in their financial results over the business cycle, cf. Chart 33.

Variable rate loans are popular with corporate customers

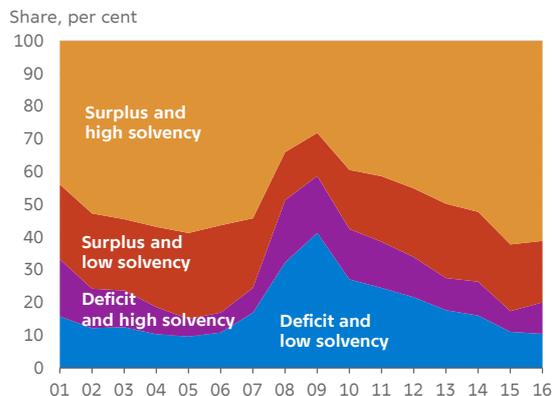
Firms in cyclical industries have a large share of variable rate mortgage loans, cf. Chart 34.

For many firms, it makes sense to use variable rate loans in their funding structures. In a traditional business cycle, their borrowing costs will drop during the downturn, given that interest rates tend to fall with the decline in economic activity. Conversely, financial costs are higher in a boom period.

But the current economic upswing is different in that interest rates remain very low. A sudden reversal in the market risk perception could lead to an abrupt hike in interest rates. This poses a risk to customers who have primarily opted for variable rate financing.

Firms in cyclical industries faced difficulties during the latest crisis

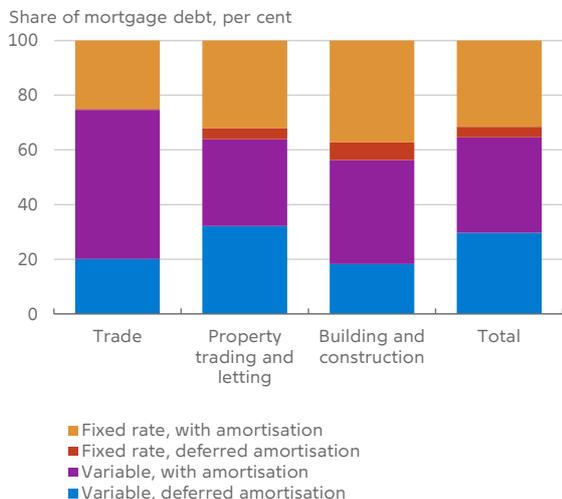
Chart 33



Note: Proportion of total debt of firms in the property trading and letting, trade and building and construction industries broken down by their financial results and solvency. High solvency is defined as an equity to total assets ratio of at least 15 per cent. The businesses of the self-employed are not included.

Source: Experian, Bisnode and own calculations.

Corporate customers have a large share of variable rate mortgage loans Chart 34



Note: Mortgage debt in selected industries, end-April 2018, broken down by loan products. The businesses of the self-employed are not included.

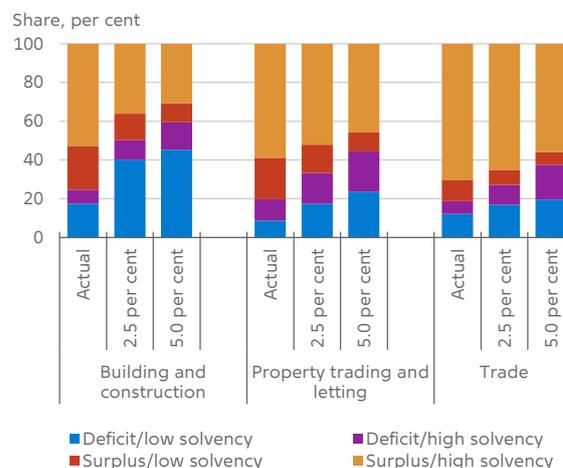
Source: Danmarks Nationalbank and own calculations.

A sudden hike in interest rates will weaken the cyclical industries

The interest rate sensitivity of cyclical industries has been assessed using a number of higher interest rate scenarios. Calculations based on available financial figures for 2016 show that a sudden hike in interest rates will weaken a substantial portion of the firms, cf. Chart 35. In view of the positive economic developments, the general situation of the industries has presumably improved since 2016.

If interest rates were to rise by 2.5 percentage points, about 50 per cent of the mortgage debt of construction firms would be held by loss-making firms. In the property trading and letting and trade industries, about 30 per cent of the mortgage debt would be held by loss-making firms. An abrupt increase in interest rates will hit the building and construction industry the hardest. Thus, the share of debt in companies in this industry with deficits rises to a level similar to that seen in 2011. An interest rate increase of 5 percentage points would further increase the share of debt in companies in this industry with deficits to a level similar to that in 2009 during the financial crisis. For the other industries the financial situation deteriorates to a lesser degree relative to 2009 and 2011.

Distribution of firms' debt in 2016 at the actual level of interest rates and at a higher level of interest rates Chart 35



Note: The proportion of total debt in the sectors broken down by financial results and solvency. High solvency is defined as an "equity to total assets" ratio of at least 15 per cent. The columns show the actual financial results in 2016 and the financial results and solvency in two scenarios in which the interest rate is set to increase by 2.5 percentage points and 5.0 percentage points, respectively. It is assumed that bank debt and a proportion of mortgage debt are at variable rates of interest. The proportion of variable rate mortgage debt has been derived from Danmarks Nationalbank's statistics on banks and mortgage banks from end-2016. The debt calculated in the financial statements has not been reconciled with the debt calculated in the bank and mortgage bank statistics.

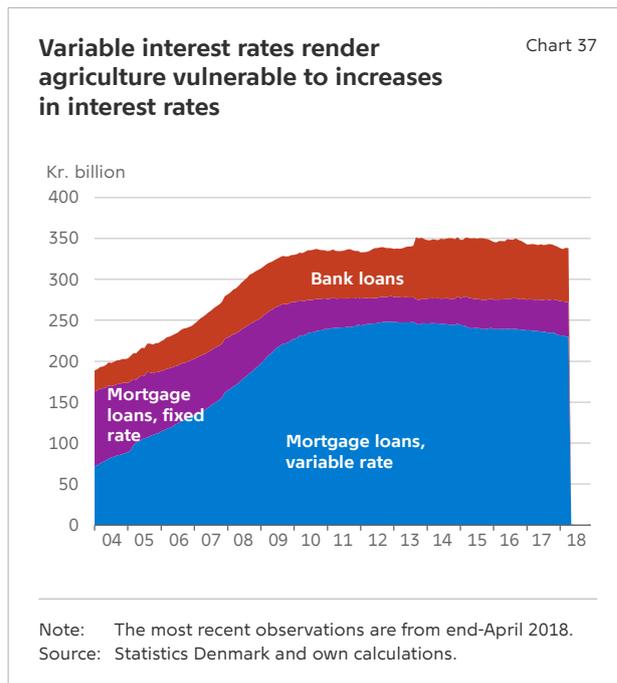
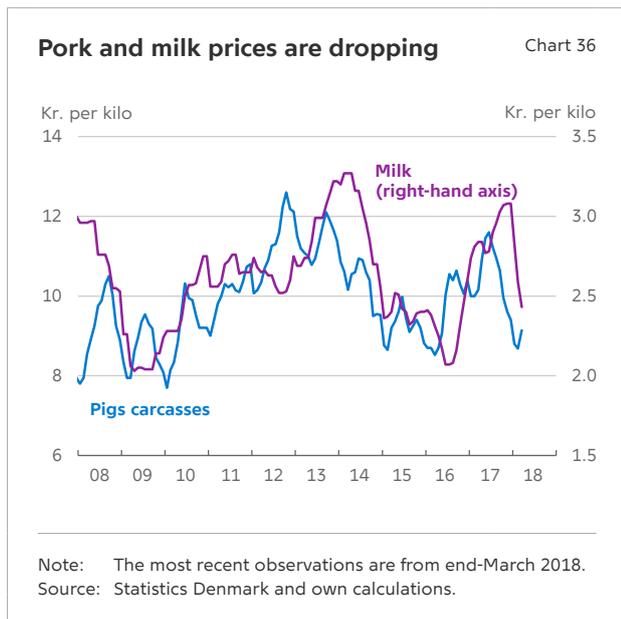
Source: Experian, Bisnode and own calculations.

The agricultural sector is still challenged by high debts

For a number of years, the agricultural sector has been challenged by high indebtedness and fluctuating sales prices.

Since July of 2017, the market price of pigs and, subsequently, the prices of milk have dropped sharply. The fall follows a period of rising sales prices, cf. Chart 36. Bolstered by the economic upswing and low interest rates, the sector was slowly beginning to consolidate. Banks' losses on lending to the agricultural sector have also been declining.

However, the total debt of the agricultural sector remains high. Recent market developments confirm that banks should not rely on price developments alone to improve the financial position of the agricultural sector. In fact, loss postponement may delay necessary adjustments and impede productivity developments in the sector.

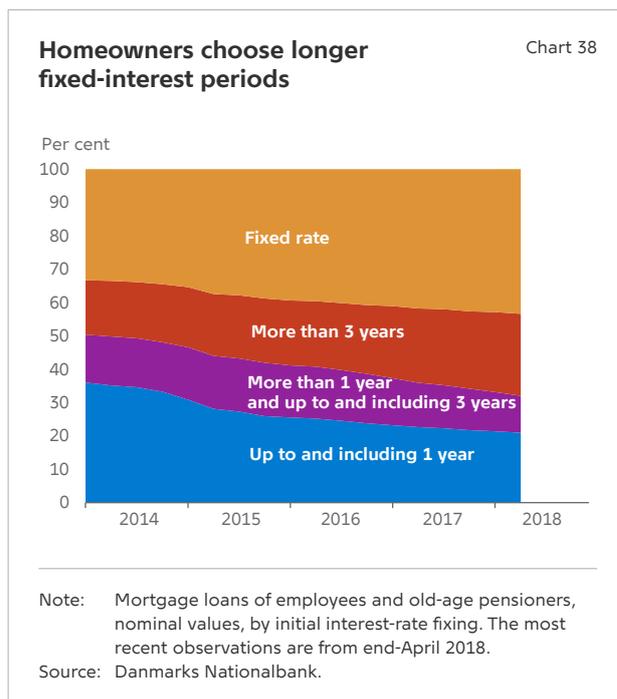


The debt composition of the agricultural sector with many variable rate loans also means that normalisation of interest rates could have major adverse implications for the agricultural sector, cf. Chart 37. The exposures of credit institutions to the agricultural sector vary considerably. In some small, local banks, the agricultural sector accounts for more than 15 per cent of total loans and guarantees, while total lending to the sector by the large banks accounts for just 3 per cent.

Longer fixed interest periods make households more resilient

Households are choosing longer fixed interest periods, but variable rate loans continue to dominate the market

Households are moving towards mortgage loans with longer fixed interest periods, cf. Chart 38. The share of variable rate mortgage loans with longer fixed interest periods than three years has risen, and the share of fixed rate mortgage loans is also increasing. The latter trend is less pronounced in the large towns and cities than in Denmark overall.⁸



⁸ Danmarks Nationalbank, Fixed-rate loans are gaining ground, *Danmarks Nationalbank Statistics (Banking and mortgage lending, balances)*, April 2018. ([link](#))

More than half of all mortgage loans are still at variable rates of interest. So a rise in interest rates will have a substantial impact on the interest burden of homeowners.

According to Danmarks Nationalbank's lending survey, several credit institutions, primarily among mortgage banks and large banks, are reporting that credit standards have been tightened relative to the previous quarter, cf. Chart 39. Several institutions state that the tightening is due to the implementation of "good practice" rules for mortgage lending. Among other measures, the new rules limit the access to granting housing loans with variable rates and short fixed interest periods to homeowners with loan-to-income, LTI, ratios greater than 4 and loan-to-value, LTV, ratios of more than 60 per cent of the home value. The rules do not limit the access to granting fixed rate loans without amortisation.

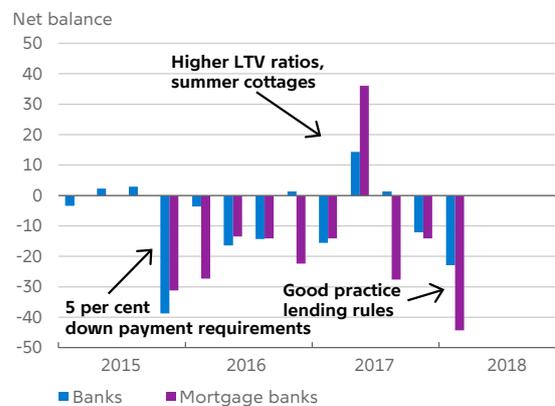
New loan types could increase debt

Over the past year, two credit institutions have introduced new loan types, allowing deferred amortisation for up to 30 years on mortgage lending. The credit institutions utilise an existing option, which was introduced in the legislation on covered bonds in 2007. These loan types give borrowers access to deferred amortisation when the LTV ratio is lower than 60 per cent. The possibility of an extended period of deferred amortisation may increase households' average LTV ratios.

The average LTV ratio for loan types with different types of deferred amortisation can be illustrated in a stylistic calculation in which all loans are assumed to have an initial LTV ratio of 80 per cent⁹. In this calculation, the average LTV ratio of the new loan types with a 30-year deferred amortisation period will rise to almost 65 per cent, cf. Chart 40. This should be seen in the context of an average LTV ratio of 47 per cent for a 30-year mortgage loan with amortisation. If housing loans with a 30-year deferred amortisation period become very popular, the increase in households' average LTV ratios will, all else equal, make them less resilient. And household indebtedness is already high.

Tighter credit standards for retail customers

Chart 39

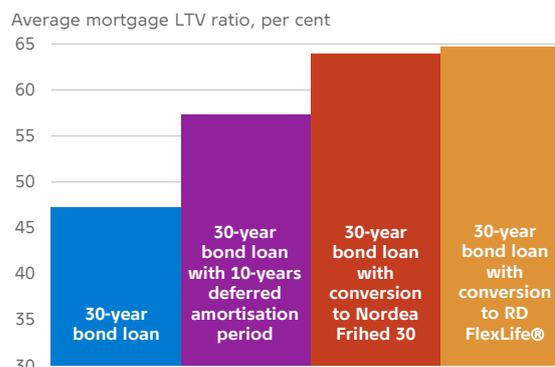


Note: The net balance lies within the interval -100 to 100. A positive (negative) net balance means that credit managers of the banks in question have, overall, i.e. lending-weighted, stated that they have eased (tightened) their standards relative to the preceding quarter. The most recent observations are from the 1st quarter of 2018.

Source: Danmarks Nationalbank.

New loan types could lead to higher average LTV ratios

Chart 40



Note: Mortgage loans are viewed over a 30-year period and all loans have an original LTV of 80 per cent. Borrowers with Frihed30 and FlexLife® take out a conventional mortgage loan and remortgage to the new loan types when the LTV falls below 60 and 75 per cent, respectively.

Source: Realkredit Danmark, Nordea and own calculations.

⁹ In the calculation of new loan types, the borrower initially takes out a 30-year bond loan and, when the LTV has decreased sufficiently, remortgages to the new loan types.

Moreover, borrowers' ability to repay their loans could change substantially over a 30-year period. Consequently, loans with an extended period of deferred amortisation may be riskier for the institutions than loan types subject to more frequent credit assessment. The risk is reduced in that the new loan types have lower LTV limits of 60 and 75 per cent, respectively, of the home value than 80 per cent for conventional mortgage loans.

Households may be vulnerable to rising interest rates combined with falling house prices

Declining interest rates in recent years have made it easier for households to service their debt. Although mortgage debt repayments have increased in recent years, total interest, administration margin and debt repayments as a percentage of household bank and mortgage bank debt continue to fall, cf. Chart 41. The interest burden decreased to 2 per cent of household bank and mortgage bank debt in 2017, and administration margin payments accounted for 0.76 per cent.

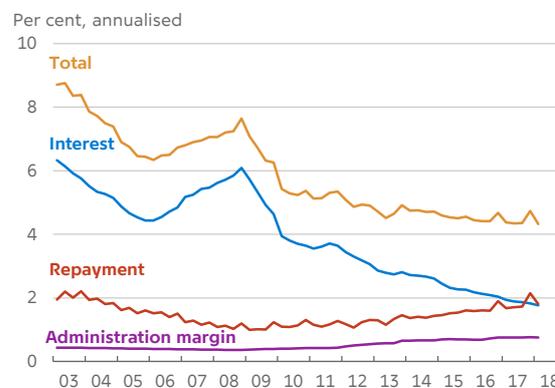
The sustained period of very low interest rates increases the probability of homeowners assuming greater risk, which may be reflected in house prices.

House prices have risen substantially in recent years, cf. Chart 42. As a result, homeowners' total debt to housing value has dropped. In 2016, one third of homeowner debt was held by households whose total debts exceeded the value of their homes, cf. Chart 43. These households are particularly vulnerable to increases in interest rates. 10 per cent of the debt is held by homeowners whose total debts exceed the value of their homes and are more than four times their income.

Since 2014, prices of single-family homes have increased by almost 20 per cent, while prices of owner-occupied flats have surged by more than 30 per cent. Hence, there is a risk of a housing market correction as seen after previous periods of substantial increases. A rise in interest rates can also be expected to exert downward pressure on house prices. In case of a 20 per cent drop in house prices, more than half of homeowner debt will be held by households whose total debts exceed the value of their homes. The very low interest rate environment provides a good opportunity for highly indebted households to reduce their debt burdens. This would boost their resilience to future interest rate rises and house price falls.

The household interest burden is shrinking

Chart 41

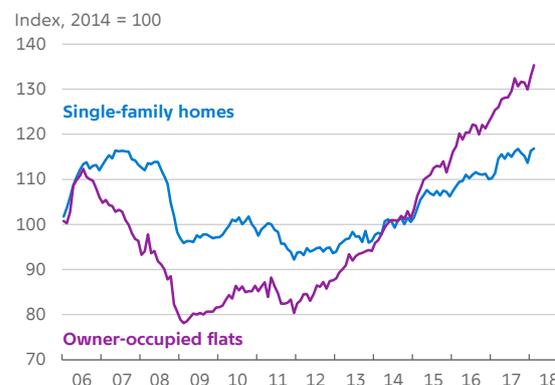


Note: Interest payments and administration margin payments and repayments as a percentage of household mortgage debt and bank debt. Due to lacking statistics for bank debt repayments, repayments include only mortgage debt repayments. The most recent observations are from the 1st quarter of 2018.

Source: Danmarks Nationalbank.

House prices are high

Chart 42

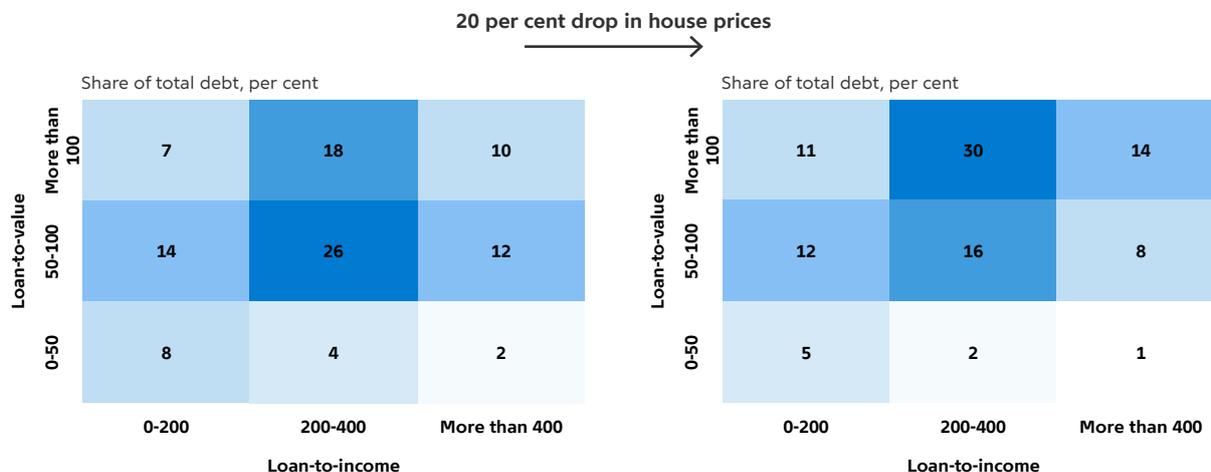


Note: Price index for single-family homes and owner-occupied flats for all of Denmark. The most recent observations are from February 2018.

Source: Statistics Denmark.

Highly indebted households are vulnerable to house price falls

Chart 43



Note: Distribution of homeowner debt relative to gross income excluding pension contributions (loan-to-income) and debt relative to house value (loan-to-value), end-2016. Debt includes housing debt and other debt. Self-employed individuals, non-tax payers and households with gross incomes below kr. 25,000 are not included. Left-hand chart: actual distribution. Right-hand chart: distribution in the event of a 20 per cent house price fall.

Source: Statistics Denmark and own calculations.

Increased integration of Nordic banking sectors

Growing exposures in Norway and Sweden

Foreign lending by Danish banks has risen strongly in recent years, cf. Chart 44.¹⁰

The increase in foreign lending is driven mainly by Danske Bank's Norwegian and Swedish activities. For a number of years, Danske Bank's strategy has been to expand its activities in these two countries to further diversify its business¹¹. Over the past three years, total lending to both countries has increased by about 25 per cent, cf. Chart 45.

After many years of rising property prices in Sweden and Norway, prices began to fall in 2017, cf. Chart 46 (left). Several international institutions, including

Foreign lending by banks is increasing

Chart 44



Note: Lending to households and non-financial corporations by the banks' foreign branches and subsidiaries. The most recent observations are from end-April 2018.

Source: Danmarks Nationalbank.

¹⁰ Recent developments in foreign lending are affected by Danske Bank entering into an agreement on the sale of a portfolio of Irish residential mortgage loans in October 2017, cf. Danske Bank's annual report 2017.

¹¹ Danske Bank's annual report 2017.

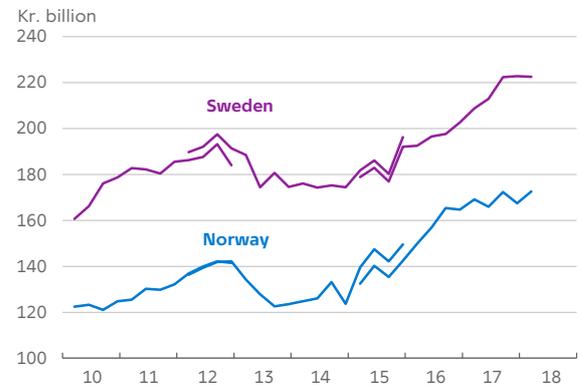
IMF, have regularly assessed that house price developments in both Norway and Sweden constitute a major risk to the real economy and the financial sector. Other things being equal, a continued decline in house prices will increase the risk associated with housing lending in the two countries.

Overall, Danske Bank's lending is robust, with average LTV ratios of between 60 and 65 per cent, cf. Chart 46 (right). The LTV ratios have not fallen as much as house prices have risen. The LTV ratios for Norwegian lending have remained unchanged in recent years. This indicates that new loans have been provided at higher LTV ratios. All else equal, this increases the risk of losses on loans if house prices continue to fall.

Risk linked to systemically important branches must be manageable

Danske Bank's increasing activities in Sweden and Norway exemplify how the Nordic-Baltic banking market is becoming still more integrated. Thus, a number of large banking groups operate across the Nordic-Baltic countries. In April 2018, the market share for lending in Denmark by branches of foreign banks was 8 per cent, while foreign lending by Danish institutions accounted for 17 per cent of total lending, cf. Chart 47 and Chart 48. In step with the growing financial integration, close cooperation be-

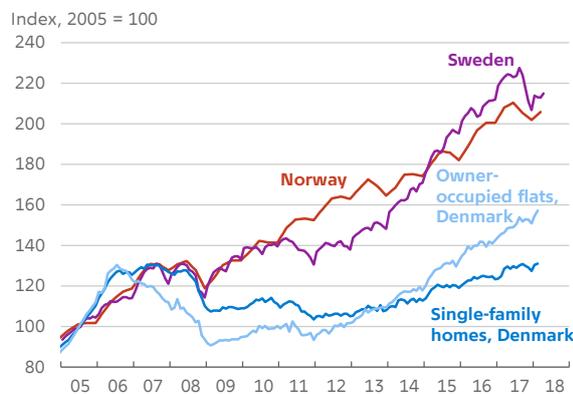
Danske Bank is expanding in Norway and Sweden Chart 45



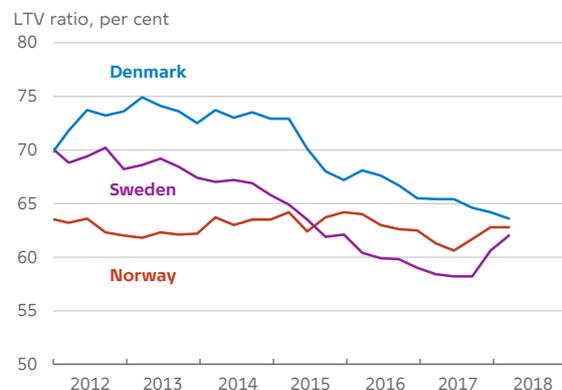
Note: Data breaks in 2012 and 2015 are due to changes in accounting policies. The most recent observations are from the 1st quarter of 2018.
Source: Danske Bank's financial statements.

Falling house prices in Norway and Sweden are increasing loan-to-values ratios Chart 46

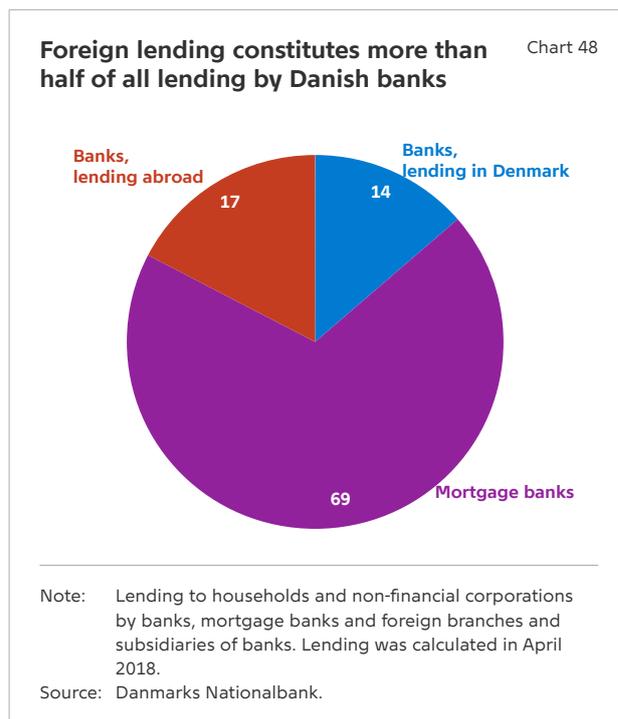
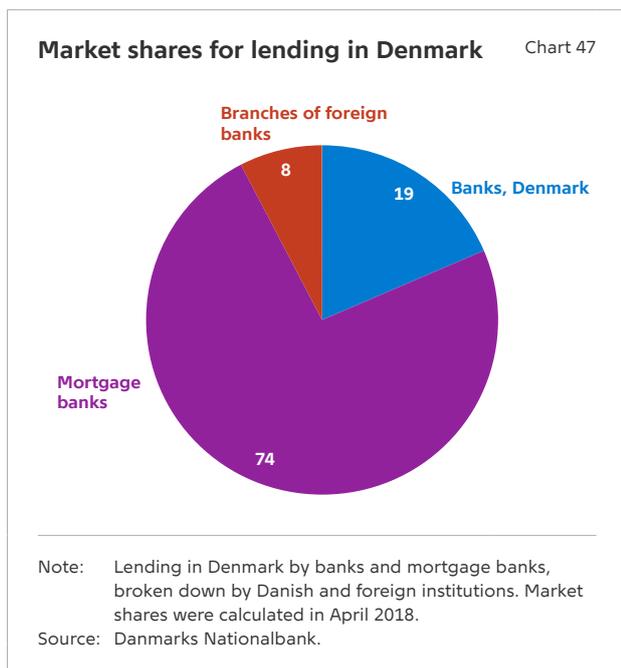
House prices



LTV ratios



Note: The most recent observations for house prices are end-February 2018 for Denmark, end-March 2018 for Norway and end-April 2018 for Sweden. The most recent observations for loan-to-value ratios are from the 1st quarter of 2018.
Source: Statistics Denmark, Valueguard, Statistics Norway and Danske Bank's financial statements.



tween the various national authorities is becoming increasingly important in relation to safeguarding financial stability.

In early 2017, the Swedish institution Nordea Bank AB changed its legal structure with the conversion of subsidiaries in Denmark, Norway and Finland into branches. As a result, the responsibility for supervision and resolution planning for Nordea’s Danish banking activities was transferred from the Danish to the Swedish authorities. In September 2017, Nordea Bank AB announced that they would initiate a process to re-domicile the parent company to Finland. The re-domiciliation was approved by the shareholders at the annual general meeting in March 2018 and, provided that it receives the requisite regulatory approvals, it is expected to be effective from October 2018. Given that Finland is a member of the banking union, the re-domiciliation will mean that all of Nordea Bank AB’s current banking activities in Denmark, Finland, Norway and Sweden will be subject to direct supervision by the ECB and to the resolution powers of the Single

Resolution Board.¹² However, Nordea Kredit, designated as a systemically important financial institution in Denmark in January 2017, is still a Danish subsidiary and thus subject to the powers of the Danish authorities.

Danske Bank similarly reorganised its Finnish operations into a branch of Danske Bank A/S as at 31 December 2017.

Danmarks Nationalbank finds that, fundamentally, the increased integration of the Nordic banking markets entails a number of significant advantages. Thus, it is expedient for large, cross-border institutions to have a legal structure that reflects their business and operational frameworks. This may strengthen the internal governance of the institutions and reduce administrative complexity and unnecessary regulatory burdens.

At the same time, a number of positive effects can be obtained from such restructuring. It will provide more consistent and holistic supervision of the relevant groups and the possibility of simpler handling

¹² It will also include branches of Nordea Bank AB in other EU member states.

of a recovery or resolution situation, thereby reducing systemic risks.

But it is essential that both institutions and authorities take into account that large branches are important not just for the group as a whole – they are also significant to the financial stability of the country in which the branch is located (the host country).

Existing EU legislation¹³ already sets out clear rules for the division of powers and obligations between the authorities of the home and host member states. Generally, the branch of a credit institution domiciled in an EU member state is subject to the rules, supervision and resolution powers of the home member state. EU legislation also establishes a number of principles for cooperation within supervisory and resolution colleges.

However, with the establishment of large systemically important branches, current rules need to be implemented in a more detailed and operational framework for the cooperation between the supervisory and resolution authorities of the home and host member states. Close and ongoing cooperation will ensure that the necessary allowance is made for a systemically important branch's business model and strategy, risk exposure and the risks posed by the branch to the financial system of the host member state.

Against this backdrop, in December 2016, a Memorandum of Understanding, MoU, was signed between the Nordic supervisory authorities and the ECB on information exchange and planning of supervision.¹⁴ At the same time, a Nordic MoU was signed at the political level, supporting coordination of resolution planning and reciprocity of macroprudential measures, cf. Box 4.¹⁵

Similarly, in December 2016, the Nordic and Baltic central banks signed a MoU on the role of central banks if a cross-border banking group encounters li-

Reciprocation of macroprudential measures

Box 4

Macroprudential measures address risks in the financial system. Such measures are implemented by national authorities in order to prevent the risks from becoming so large that they have negative implications for the financial system and the real economy. Macroprudential measures include initiatives such as higher capital requirements and restrictions on credit terms.

Generally, a macroprudential measure implemented by, for instance, Danish authorities applies only to institutions subject to supervision in Denmark. This means that branches of foreign banks and loans directly from banks abroad are not comprised. So to ensure the effect of the measure – and thus financial stability – it may be important that authorities in other countries recognise it. This may be especially important when it comes to large, foreign branches with significant market shares in Denmark, such as Nordea.

Recognition by other countries of a macroprudential measure, e.g. in Denmark, will also help to ensure that consistent requirements apply to Danish institutions and foreign institutions with exposures in Denmark (level playing field). This will prevent regulatory arbitrage, whereby an institution exploits differences in national regulation to place its activities in the jurisdictions with the lowest requirements. Mutual recognition of macroprudential measures is often referred to as reciprocity.

Whether foreign branches and cross-border loans are covered by a macroprudential measure also depends on the specific measure. Reciprocity may be mandatory, voluntary or not mentioned in the relevant legislation. For instance, reciprocity is mandatory for the countercyclical capital buffer up to a limit of 2.5 per cent for EU member states, while reciprocity is voluntary for the systemic buffer and not mentioned in the legislation for Pillar 2 add-ons.

The Memorandum of Understanding, MoU, entered into by the Nordic Ministers for Finance, Economic and Business Affairs¹ establishes a general principle of full reciprocity between the Nordic countries to ensure a level playing field and the smooth functioning of the single Nordic market.

1. See a description of the background to and framework for reciprocation of macroprudential measures in the Systemic Risk Council's method paper of 21 June 2017. ([link](#))

13 Capital Requirements Directive IV, CRDIV, and Bank Recovery and Resolution Directive, BRRD.

14 Cf. MoU on prudential supervision of significant branches in Sweden, Norway, Denmark and Finland. ([link](#))

15 Cf. Memorandum of Understanding on cooperation regarding significant branches of cross-border banking groups. ([link](#))

quidity problems. The MoU supports information exchange between the central banks and their possible cooperation in this situation. Finally, in January 2018, a MoU was signed on cooperation and coordination on cross-border financial stability between relevant ministries, central banks and supervisory and resolution authorities in the Nordic-Baltic countries.¹⁶

Efforts are also being made at the EU level to ensure sufficiently close cooperation between the authorities. To support these efforts, in November 2017, the European Banking Association, EBA, adopted new guidelines on cooperation and coordination of supervision of “significant-plus” branches.¹⁷ These are branches which provide critical functions that are essential either to the institution or group or to the financial stability of the host member state. In such cases, the relevant supervisory authorities must adopt an intensified and more coordinated approach to supervision and assessment of recovery planning.

The attempts, under the auspices of the EBA, to establish a pan-European understanding of how best to handle systemically important branches in terms of supervision is a positive step. However, in the assessment of Danmarks Nationalbank, the strengthened collaboration within the banking union, where there is a single central supervisory authority and resolution authority, will be far more effective when it comes to containing the systemic risks linked to the cross-border activities of the large institutions.¹⁸

One of the main objectives of the banking union – with a Single Banking Supervisory Mechanism (under the auspices of the ECB) and a Single Resolution Board, SRB, – is to ensure strong and harmonised regulatory handling of cross-border banking activities. The banking union currently comprises euro area member states only. The Danish government is currently performing various analyses with a view to deciding on Danish participation in the autumn of 2019. The Swedish government is also analysing the implications of possible Swedish participation.

Danmarks Nationalbank believes that Denmark should participate in the banking union. This would lead to enhanced supervision and a stronger framework for the resolution regime for Danish banks. At the same time, it would increase competition for financial services in Denmark – for the benefit of citizens.

16 Cf. MoU on cooperation regarding banks with cross-border establishments ([link](#)) and MoU on cooperation and coordination on cross-border financial stability ([link](#)).

17 Cf. Guidelines on supervision of significant branches, EBA/GL/2017/14, 1 November 2017, applying from 1 January 2018.

18 In the autumn of 2017, the Danish government launched work to finally decide on Danish participation in the banking union. The Coordination Committee on Financial Stability is in charge of this work.

Appendix to the Financial Stability analysis: data

The analysis of the earnings, liquidity and own funds of Danish credit institutions is based on the six credit institutions in 2017 classified by the Danish Financial Supervisory Authority as systemically important financial institutions, SIFIs. In addition, Spar Nord is included in the group of systemic credit institutions, since the Minister for Industry, Business and Financial Affairs in December 2017 announced that the bank would be appointed as a SIFI as a result of the adjusted model for appointing SIFIs. The analysis also includes the

non-systemic banks grouped by the Danish Financial Supervisory Authority as group 2 in 2017, cf. Table 1. Nordea Bank Danmark is no longer a SIFI, as it was converted from a subsidiary into a branch from 1 January 2017. In that connection, Nordea Kredit was classified as a SIFI. Unlike in the Danish Financial Supervisory Authority's group 2, Saxo Bank has been omitted from the population due to its business model and Spar Nord has been moved to group 1. The grouping also applies back in time.

Banks and mortgage banks in the analysis by total assets as at 31 December 2017, kr. million

Table 1

Systemic credit institutions	Amount	Non-systemic banks	Amount
Danske Bank (incl. Realkredit Danmark)	3,193,311	Arbejdernes Landsbank	47,261
Nykredit Realkredit (incl. Nykredit Bank)	1,426,810	Ringkjøbing Landbobank	25,796
Jyske Bank (incl. BRFKredit)	597,440	Sparekassen Kronjylland	23,288
Nordea Kredit	440,201	Vestjysk Bank	21,902
DLR Kredit	163,375	Sparekassen Sjælland-Fyn A/S	21,443
Sydbank	138,494	Nordjyske Bank	20,527
Spar Nord	80,367	Lån & Spar Bank	19,212
Systemic financial institutions, total	6,039,997	Sparekassen Vendsyssel	17,510
		Jutlander Bank	16,753
		Den Jyske Sparekasse	15,015
Systemic banks		Non-systemic banks, total	228,707
Danske Bank	2,293,624		
Jyske Bank	295,738	Mortgage banks	
Nykredit Bank	172,925	Nykredit Realkredit (incl. Totalkredit)	1,367,291
Sydbank	140,763	Realkredit Danmark	876,874
Spar Nord	80,597	Nordea Kredit	440,201
Systemic banks, total	2,983,648	BRFKredit	337,732
		DLR Kredit	163,375
		LR Realkredit	24,236
		Mortgage banks, total	3,209,708

Note: The total assets of systemic banks, non-systemic banks and mortgage banks are stated at bank-specific level, while the total assets of the systemic groups are stated at group level.

Source: Danish Financial Supervisory Authority.

In the analysis and assessment of lending activity, focus is on the grouping of large and medium-sized banks in Danmarks Nationalbank's lending survey. Large banks are the Danish Financial Supervisory Authority's group 1 plus Nordea Bank Danmark, while medium-sized banks are the Danish Financial Supervisory Authority's group 2 plus Handelsbanken and Santander Consumer Bank.

The analysis applies the term "credit institutions" when referring to both banking and mortgage banking activities. The term "bank" is used when referring specifically to the banking activities.

ABOUT ANALYSIS



As a consequence of Danmarks Nationalbank's role in society we conduct analyses of economic and financial conditions.

Analyses are published continuously and include e.g. assessments of the current cyclical position and the financial stability.

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