Danmarks Nationalbank

Financial stability

2011

DANMARKS NATIONAL BANK 2011

FINANCIAL STABILITY 2011

The small picture on the cover shows a characteristic section of Danmarks Nationalbank's building, Havnegade 5 in Copenhagen. The building, which was constructed in 1965-78, was designed by the architect Arne Jacobsen (1902-71).

Financial stability 2011, is available on Danmarks Nationalbank's website:
www.nationalbanken.dk under publications.

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This publication is based on information available up to 24 May 2011.

Explanation of symbols:

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

Details may not add due to rounding.

Rosendahls/Schultz Grafisk A/S
ISSN 1602-057X
ISSN (Online) 1602-0588

Contents

Foreword

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

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

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

Summary and Recommendations

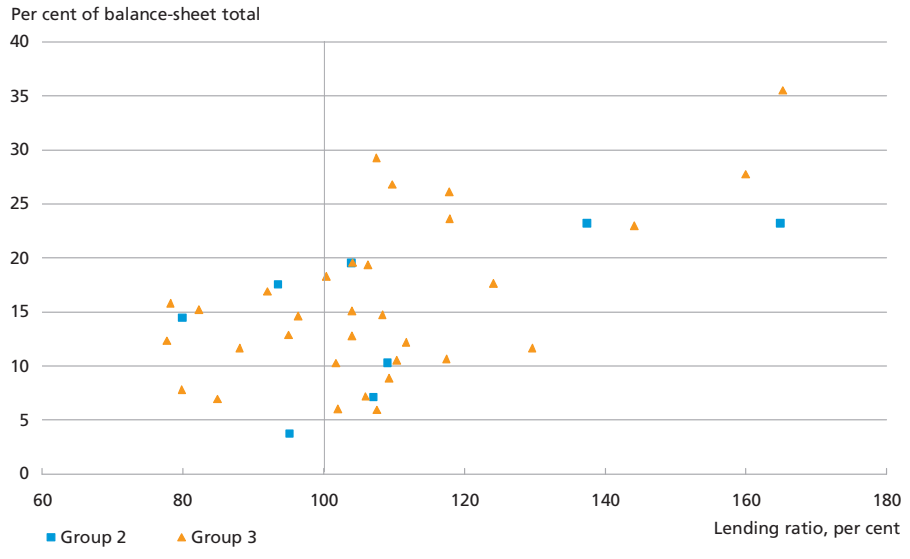
SUMMARY

Banking institutions

The Danish banking institutions generally strengthened their capital bases in 2010, but there is still considerable variation across the institutions. Overall the banking institutions' earnings improved a little, which is attributable to lower loan impairment charges, although the level remains high. Especially the large institutions have improved their earnings, while the medium-sized institutions still post a deficit overall.

The banking institutions have almost halved their customer funding gap since end-2008. Several banking institutions have made extensive use of the option to issue debt with individual government guarantees under Bank Rescue Package 2. For two thirds of the institutions, such issuances have helped to bridge the customer funding gap. For a few institutions in groups 2 and 3, these issuances constitute more than 25 per cent of their balance-sheet total, cf. Chart A. The institutions should

LENDING RATIO AND GOVERNMENT-GUARANTEED ISSUANCES AS A PERCENTAGE OF THE BALANCE-SHEET TOTAL, END OF 1ST QUARTER 2011 Chart A



Note: Lending before loan impairment charges. Comprises banking institutions in groups 2 and 3, except those transferred to the Financial Stability Company. The lending ratio is calculated as lending as a percentage of deposits. Lending and deposits are stated for households and corporate customers excluding credit institutions.
Source: Financial Stability Company and Danmarks Nationalbank.

already now begin to prepare for the expiry of the government guarantees in 2012 and 2013.

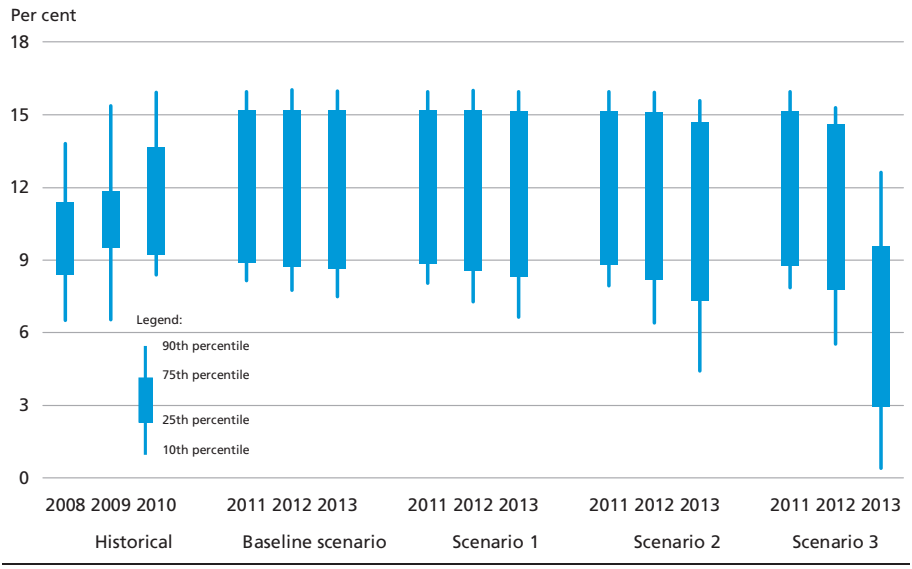
The new winding-up scheme under Bank Rescue Package 3 was used for the first time in February 2011, when Amagerbanken failed. The credit rating agency Moody's has subsequently downgraded several Danish banking institutions. Among the reasons stated by Moody's is that the use of the new winding-up scheme has given rise to a reassessment of the probability of intervention by the Danish government to save a failing banking institution without losses to creditors.

The fact that creditors are at risk of suffering losses if a banking institution fails implies that the price of the banking institutions' financing to a higher degree reflects their risk profile. This gives the banking institutions an incentive to improve their financial strength and assume fewer risks. In the longer term, this will contribute to a more robust sector and increased financial stability.

Stress test of banking institutions

Danmarks Nationalbank's stress test shows that the Danish banking institutions overall and under the current capital requirements are capitalised to meet a more negative development than expected, cf. Chart B. The resilience of the institutions is tested in three stress scenarios. In the first

COMMON EQUITY TIER 1 — Chart B



Note: Under the existing regulation, applicable in 2011 and 2012, the individual institution must hold at least 2 per cent Common Equity Tier 1. The Basel III requirement in 2013 is 3.5 per cent, and the fully phased-in Basel III requirement is 4.5 per cent. The additional capital conservation buffer is 2.5 per cent.

Source: Danish Financial Supervisory Authority and own calculations.

scenario, the Danish economy deteriorates significantly, unemployment rises by 1.5 percentage points relative to the baseline scenario and house prices fall by 20 per cent. In the second scenario, a negative shock to interest-rate developments entails that the average bond yield becomes 3 percentage points higher than expected in the baseline scenario. The third scenario tests the resilience of the institutions to an extremely adverse economic development.

The new capital adequacy rules will tighten the requirements for the banking institutions' capital. Under these requirements, parts of the sector are insufficiently capitalised to withstand negative shocks to the economy. The phasing-in period gives the institutions time to improve their capitalisation. However, the institutions should be aware that the capital markets may expect them to meet the requirements sooner.

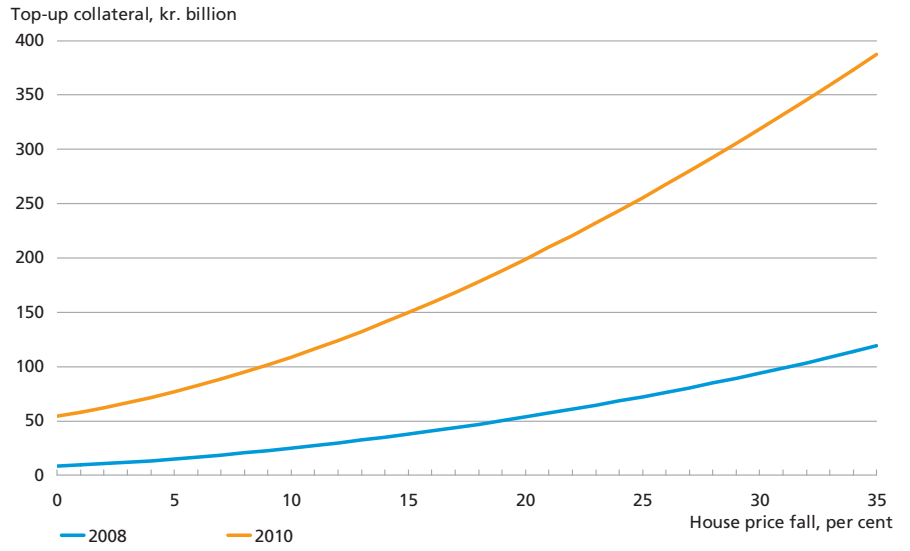
Mortgage-credit institutes

Loan impairment charges on mortgage loans have been low throughout the crisis. Loan impairment charges declined in 2010, following the pattern of the arrears ratio, while administration margins increased.

The mortgage-credit institutes' need to be able to issue bonds on an ongoing basis has increased substantially in recent years – for two reasons. Firstly, the total outstanding volume of bonds for financing adjustable-rate loans has almost doubled since 2008. In order to reduce the refinancing risk, Nykredit Realkredit, in particular, has spread its refinancing over the year so that much of it takes place at other times than in December. The other mortgage-credit institutes have done so to a limited extent only. Spreading the refinancing requirement evenly over the year is not sufficient to resolve the refinancing issue.

Secondly, there has been a large increase in the outstanding volume of covered bonds (SDOs and SDROs). For bonds with SDO status, the minimum requirement for the value of the underlying collateral must be met on an ongoing basis. If house prices fall, the value of the collateral deteriorates, and the mortgage-credit institute may have to issue new debt by way of junior covered bonds (JCBs) to finance the top-up collateral. On the basis of an analysis of a sample of the mortgage loans and house values of Danish households, it is estimated that the aggregate need for top-up collateral would be more than kr. 100 billion if house prices fell by 10 per cent. This is considerably more than in 2008, cf. Chart C. It can be difficult to finance top-up collateral when required. The mortgage-credit institutes can to some extent avoid this situation by ensuring that they have sufficient buffers, i.e. by selling JCBs for financing top-up collateral in advance, by reducing the mortgaging ratio or by restricting access to deferred amortisation.

NEED FOR TOP-UP COLLATERAL ON GENERAL FALL IN HOUSE PRICES Chart C



Source: Own calculations.

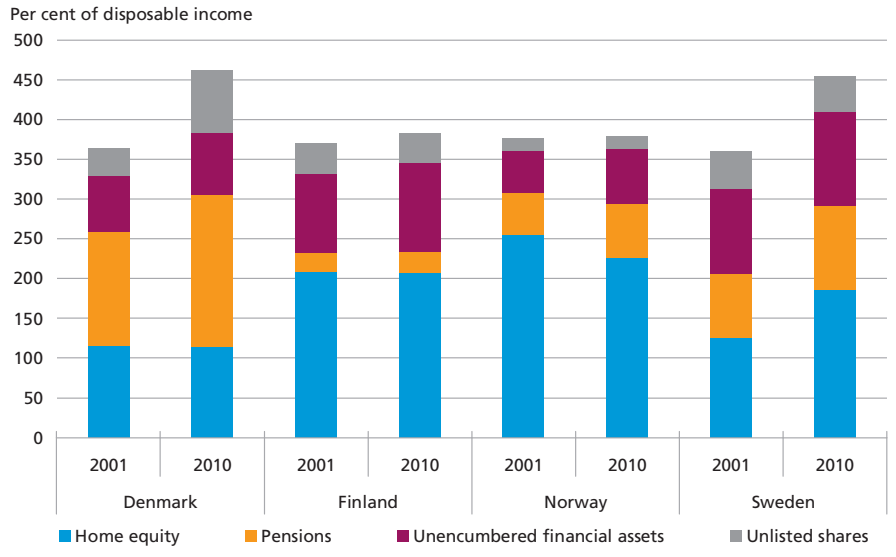
The corporate sector and the households

The economic recovery means that the corporate sector's probability of default is expected to be slightly lower in 2011 than in 2010. If the smallest companies are disregarded, the debt-to-equity ratio of the corporate sector has generally fallen in recent years, and there are indications that the companies are consolidating. The banking institutions' loan impairment charges to the corporate sector are expected to be lower in 2011 than in 2010.

During recent years, the households' debt has risen more than their income, debt amounting to approximately 3 times the annual disposable income at end-2010. The debt level is high compared with other Nordic countries. In the period from 2001 to 2010, the assets of the Danish households have increased more than their debts. While the level of the households' net wealth was similar in Denmark, Norway, Sweden and Finland in 2001, it was higher in Denmark and Sweden than in Norway and Finland by 2010, cf. Chart D. In Denmark, a large share of the households' net wealth is tied up in illiquid assets such as pension savings and unquoted shares. The combination of high debt and illiquid assets has increased the households' vulnerability to changes in interest rates and loss of income.

The larger part of the households' debt is at variable interest rate and much of it is with deferred amortisation. The low interest rates in recent years have made it easier for households to service their debts. However,

NET HOUSEHOLD WEALTH Chart D



Note: Net wealth of the aggregate household sector, i.e. including the self-employed e.g. farmers. Home equity is the difference between the housing market value (excluding agricultural land and other undeveloped land owned by the household sector) and total housing loans. Share certificates regarded as financial assets in the national accounts are included as housing wealth. Pension wealth is estimated net values based on tax rates reported in the OECD report "Pensions at a Glance, 2011". Unencumbered financial assets are financial assets other than pension assets and unlisted shares less non-housing debt. Unlisted shares also include unlisted equity securities.

Source: Own calculations based on figures from Danmarks Nationalbank, Statistics Denmark, Eurostat, Statistics Finland, Statistics Norway and Statistics Sweden.

the increased interest rate sensitivity means that increases in interest rates will have a stronger impact on household finances.

An analysis based on a sample of the households indicates that the loan amount is, on average, higher for adjustable-rate and deferred-amortisation loans than for fixed-rate loans with amortisation. This financing pattern could indicate that the households with the most risky loans are less resilient to interest-rate increases and loss of income. The currently available financing options and the advice offered may encourage households to hold smaller financial buffers related to real property than is the case with more traditional loan types. If many households have a high vulnerability, this may have a negative impact on financial stability.

The financial infrastructure

The Danish payment and settlement systems functioned satisfactorily in 2010. Occasional settlement incidents were followed up by initiatives to improve the systems. In VP settlement, focus is on improving the proportion of equity trades settled on time. As regards retail payments, the scope for reducing the settlement times is being reviewed.

SPECIAL TOPICS

Basel III and Danish credit institutions

Basel III stipulates stronger capital and liquidity requirements, and in 2011 the European Commission is expected to present a proposal for similar rules. The requirements will apply to both banking institutions and mortgage-credit institutes.

In the capital area, the requirements in terms of both the quality and quantity of the institutions' capital will be strengthened. According to the new Basel standards, the requirements are to be implemented over a 10-year period beginning in 2013. An analysis of the capitalisation of Danish banking institutions shows that they would have had to raise new capital of a better quality totalling some kr. 13 billion if these requirements had applied in 2010. If they had also had to maintain a capital conservation buffer of 2.5 per cent of the risk-weighted assets, they would have needed to raise a further kr. 15 billion. Furthermore, the market may require credit institutions to hold further excess capital. The need for new capital should be seen in relation to the credit institutions' total capital, which was approximately kr. 471 billion at end-2010.

In the liquidity area, the Basel proposal will introduce two new liquidity requirements from 2015 and 2018, respectively. One requirement aims to ensure sufficiently large liquidity buffers in the short term, while the other relates to sufficient stable funding in the long term. These requirements have not been finalised, but their content will determine the need for adjustment. As a consequence of the new requirements, the individual banking institution may need to achieve better balance between deposits and lending or to obtain longer maturities for its market-based funding. For the mortgage-credit institutes, the stable funding requirement represents a particular challenge in relation to issuing short-term bonds for financing adjustable-rate loans.

Macroprudential regulation

Macroprudential regulation is intended to address systemic risks in the financial system in order to promote financial stability for the benefit of economic growth and welfare. Hence macroprudential regulation supplements microprudential regulation, which focuses on the resilience of individual financial institutions. Macroprudential regulation supplements other macroeconomic stabilisation policies such as fiscal and monetary policies, but cannot replace sound macroeconomic policies.

The need to identify and address risks in the financial system exists in all countries. As a result of the financial crisis, a number of initiatives

have been launched to improve macroprudential regulation. The coming EU capital adequacy rules will introduce a macroprudential instrument in the form of a countercyclical capital buffer to prevent the accumulation of systemic risk over time. In addition, it is being discussed at the global level how risks concentrated on global systemically important financial institutions are to be managed.

Danmarks Nationalbank sees macroprudential regulation as a core element of the framework for ensuring robust management of systemic risk in future.

RECOMMENDATIONS

The assessment of the most significant systemic risks and the analyses in the report lead to the following recommendations for strengthening financial stability in Denmark:

1. Banking institutions should ensure that they have a sufficient capital base

Capital requirements will be tightened in the coming years as the new capital adequacy rules are phased in. The stress test shows that several banking institutions are insufficiently capitalised to meet the new requirements if the economy develops more negatively than expected. Capital markets may expect institutions to meet the requirements sooner. In the future, the institutions must also expect to be assessed on the basis of their individual financial strength to a greater extent than previously. In a situation where parts of the sector are insufficiently capitalised, there is an increased risk of financial instability.

Danmarks Nationalbank recommends that the institutions in their capital planning ensure that their capital base is sufficient to meet the tighter capital requirements under the new capital adequacy rules, even in a worse-than-expected economic scenario. A strong capital base will also facilitate access to market-based financing. The need to strengthen the capital base can be addressed by not distributing dividend and by raising further capital in the market. Redemption of capital, including of government capital injections, should take into account the need to strengthen the capital base. The institutions should raise new capital well in advance.

2. The banking institutions should prepare for the expiry of government-guaranteed debt

Debt issued under individual government guarantees will mature during 2012 and 2013. The challenge in relation to refinancing this debt is amp-

lified because several institutions will need to issue debt at the same time. For a few institutions, these issuances constitute a significant share of the balance-sheet total. A situation where a large number of banking institutions suffer liquidity problems at the same time may lead to financial instability.

Danmarks Nationalbank recommends that the institutions already now begin to prepare for the expiry of the government guarantees by ensuring that they have access to sufficient financing without government guarantees. The institutions will have to take precautions to avoid situations in which refinancing of debt is not possible. Some institutions should consider whether their business model is viable in the longer run and make the necessary adjustments.

3. Risk in relation to top-up collateral should be reduced

Under SDO (covered bond) legislation, a minimum requirement for the value of the collateral pledged for a loan must be met on an ongoing basis. If house prices fall sharply, the mortgage-credit institutes may have to pledge top-up collateral that is financed by issuing junior covered bonds. If a decline in house prices coincides with a crisis in the financial markets, such issuance may be difficult or, at worst, impossible. If the necessary top-up collateral cannot be pledged, the bonds will lose their SDO status.

Danmarks Nationalbank recommends that the mortgage-credit institutes take steps to avoid such a situation well in advance. The government has set up a working group to look into the consequences of the requirement for top-up collateral and its impact on financial stability in Denmark. Danmarks Nationalbank attaches importance to finding a viable and durable solution which reduces the risk that the top-up collateral requirement leads to financial instability.

4. The refinancing risk in relation to adjustable-rate loans should be reduced

When adjustable-rate loans were introduced, mortgage-credit institutes began to issue short-term bonds for financing long-term loans to a large and increasing extent. This structure entails a risk as the loans must regularly be refinanced. The financial crisis has demonstrated that normally well-functioning markets may suddenly stop functioning. If a situation arises in which it is not possible for the mortgage-credit institutes to refinance the adjustable-rate loans, this will have a serious impact on financial stability. By spreading the refinancing requirement over the year, the mortgage-credit institutes have taken the first step to reduce this risk, but this is not sufficient.

Danmarks Nationalbank recommends that the mortgage sector addresses the inherent risk in adjustable-rate loans. The sector has initiated a process to investigate how the refinancing risk can be reduced. Danmarks Nationalbank emphasises that the solutions found should be robust.

5. Households should ensure that they are resilient

There are indications that homeowners who have taken out loans with variable interest as well as deferred amortisation have lower financial buffers than homeowners with more traditional loan types. Variable-rate and deferred-amortisation loans entail increased fluctuation in the payments required to service the debt, which in turn increases the vulnerability to increasing interest rates, among other things. At the same time, these types of loans amplify fluctuations in house prices.

It is important that households ensure that their finances are sufficiently resilient to fluctuations in both payments and house prices. Lenders should perform realistic "stress tests" under different conditions when offering advice and considering loan applications and should not let households take on greater risks than their finances allow.

6. Special requirements should be imposed on systemically important financial institutions

Some financial institutions are so important to the economy and the financial system and the consequences if they failed would be so far-reaching that this is not a viable option in practice. The requirements of such institutions, both in terms of regulation and supervision, should be so strict that the risk of failure is eliminated to the extent possible. This is a common interest that society must protect if the owners and management are not capable of doing so.

Systemically important financial institutions can expect to be subject to tighter capital and liquidity requirements. The specific requirements are currently awaiting international recommendations in this area. Danmarks Nationalbank recommends that large credit institutions prepare for such tighter requirements.

Report Section

1. Earnings and Capital Adequacy

The Danish banking institutions' earnings improved slightly in 2010. The improvement was due to lower loan impairment charges, although the level remained high. Especially the large banking institutions recorded higher profits, while the medium-sized institutions taken as one continued to post losses. The banking institutions' lending declined and the customer funding gap was reduced.

The banking institutions generally strengthened their capital bases. Most of the banking institutions were able to meet the solvency requirement by their Common Equity Tier 1 (core Tier 1) alone. However, the institutions should maintain an adequate capital base in order to ensure room for manoeuvre in periods of negative developments in the capital markets.

The Nordic banking groups also increased their earnings in 2010. Loan impairment charges were reduced, although exposures in countries with weak economies had an adverse impact on earnings. The groups generally strengthened their capital bases, but they must expect continued pressure for further improvements from both authorities and markets.

Loan impairment charges for mortgage-credit institutes declined, having been at a very low level throughout the crisis.

BANKING INSTITUTIONS IN DENMARK

Earnings still affected by the crisis but signs of improvement

The economic crisis continued to affect the earnings of the banking institutions in 2010, but there were signs of improvement, particularly in the large institutions. Unable to meet the solvency requirement, two small banking institutions, Capinordic Bank and EIK Bank, were acquired by the Financial Stability Company. The acquisition agreements were finalised before the expiry of the general government guarantee under Bank Rescue Package 1. In February 2011 another banking institution, Amagerbanken, was acquired by the Financial Stability Company under the winding-up scheme of Bank Rescue Package 3. The winding-up scheme and Amagerbanken's acquisition by the Financial Stability Company are described in Appendix 1.

The banking institutions in group 1 achieved a total profit before tax of kr. 12.6 billion in 2010 compared with kr. 1.0 billion in 2009. In group 2* the banking institutions reported losses before tax of kr. 0.5 billion in

POPULATION Box 1

The analyses in this chapter are based on the banking institutions included in the Danish Financial Supervisory Authority's groups 1 and 2 as at 31 December 2010. Group 1 comprises institutions with working capital (deposits, bonds issued etc., subordinated capital and equity capital) of at least kr. 50 billion, while Group 2* comprises institutions with working capital of kr. 10-50 billion. In contrast to the Danish Financial Supervisory Authority's groups, Saxo Bank has been omitted, and banking institutions under the Financial Stability Company have not been included in the analyses either. In the analyses, the grouping also applies prior to the above date. Banking institutions that have been subject to acquisitions are included under the continuing company's group.

Group 1	Group 2*
Danske Bank	Alm. Brand Bank
FIH Erhvervsbank	Arbejdernes Landsbank
Jyske Bank	Ringkjøbing Landbobank
Nordea Bank Danmark	Sammenslutningen Danske Andelskasser
Nykredit Bank	Spar Nord Bank
Sydbank	Sparbank
	Sparekassen Kronjylland
	Sparekassen Sjælland
	Vestjysk Bank

Loans and guarantees furnished by groups 1 and 2* were approximately 81 and 7 per cent, respectively, of total loans and guarantees furnished by Danish banking institutions as at 31 December 2010.

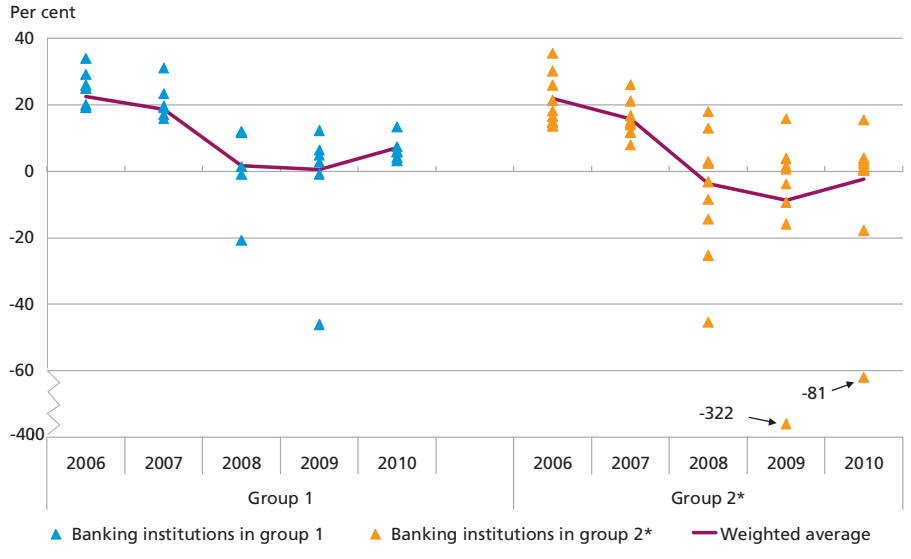
Several of the banking institutions are parent companies of other financial enterprises and therefore prepare both separate and consolidated financial statements. To provide the best possible overview of the development in the institutions banking activities, the analyses have primarily been based on separate financial statements, i.e. unconsolidated data. Analyses of Nordic banks are, however, based on consolidated financial statements so that the choice of operating structure abroad – in subsidiaries or branches – does not affect the analyses. Analyses of Nordic banks include Danske Bank, Nordea, DnB NOR, SEB, Svenska Handelsbanken and Swedbank.

Analyses of mortgage-credit institutes comprise Realkredit Danmark, Nordea Kredit, Nykredit Realkredit, Totalkredit, DLR Kredit, BRF Kredit, LR Realkredit and FIH Realkredit.

2010, an improvement compared with the loss of kr. 1.6 billion in 2009. Box 1 shows the banking institutions in groups 1 and 2*.

In group 1 the return on equity before tax increased to 7.1 per cent in 2010 from 0.6 per cent in 2009, cf. Chart 1. The increase was mainly attributable to lower loan impairment charges in 2010. In group 2* the return on equity was negative by 2.4 per cent against a negative 8.6 per cent in 2009. In group 2* loan impairment charges were reduced in 2010 overall. The return on equity varied considerably among the banking

RETURN ON EQUITY BEFORE TAX — Chart 1

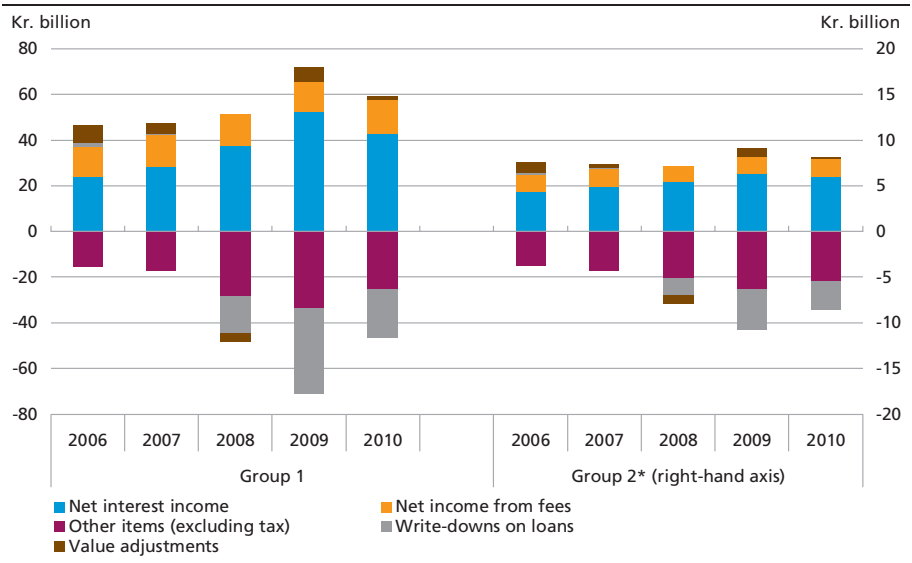


Note: Return on equity before tax is calculated as profit before tax as a percentage of average equity.
Source: Danish Financial Supervisory Authority.

institutions in group 2*. Two of the nine banking institutions in group 2* reported losses in 2010, while all group 1 institutions reported profits.

After a number of years with growing net interest income, the development reversed in 2010, cf. Chart 2. As a result of lower lending vol-

EARNINGS BROKEN DOWN BY KEY ITEMS — Chart 2



Note: "Other items" comprises dividends from shares, other operating income, income from subsidiaries and associated companies, other operating costs, staff and administrative costs, depreciation and the result of discontinued operations.
Source: Danish Financial Supervisory Authority.

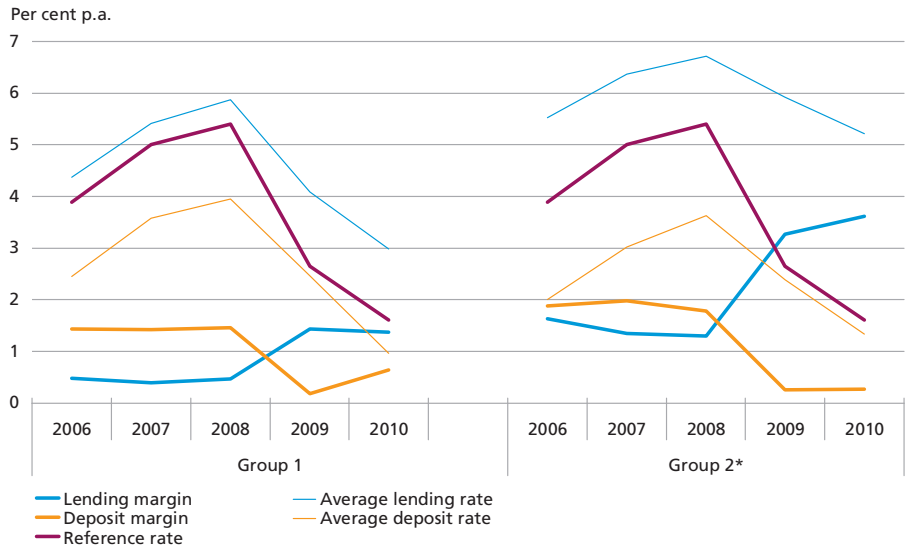
umes and reduced interest income from bond portfolios, net interest income decreased by 18 and 5 per cent in groups 1 and 2*, respectively. This development was particularly pronounced among banking institutions in group 1.

The average lending margin for group 1 was unchanged in 2010 compared with 2009, while the deposit margin rose slightly. In group 2*, the average lending margin increased, while the deposit margin remained unchanged, cf. Chart 3. The current very low level of interest rates makes it difficult to achieve a positive deposit margin. At the same time, intensified focus on stable funding boosted competition among the institutions for deposits.

For groups 1 and 2* taken as one, net value adjustments amounted to only kr. 1.6 billion in 2010 compared with kr. 7.5 billion in 2009. Capital gains on bonds were only partially offset by losses on equities, financial derivatives and other liabilities. Income from subsidiaries and associated companies rose to kr. 8.3 billion in 2010 from kr. 4.3 billion in 2009.

Costs (excluding impairments) as a ratio of income for group 1 increased from 52.0 per cent in 2009 to 52.9 per cent in 2010 and from 69.9 per cent to 70.7 per cent for group 2*. In the course of 2010, the average number of full-time employees fell by approximately 2 per cent for group 1 and approximately 5 per cent for group 2*.

LENDING AND DEPOSIT RATES AND INTEREST MARGINS — Chart 3



Note: Calculated on the basis of data in notes to financial statements. The reference rate for both the lending and deposit margins is the T/N uncollateralised money-market rate plus 95 basis points.
Source: Danish Financial Supervisory Authority.

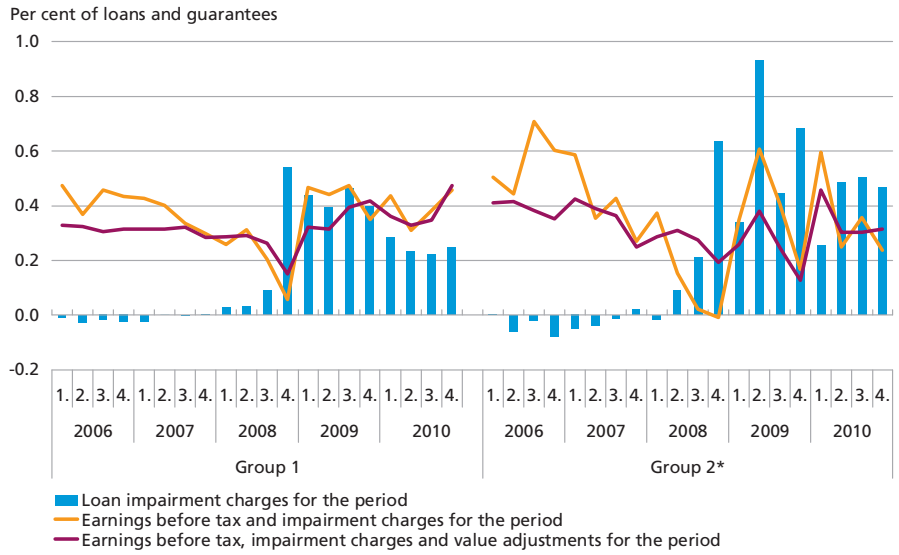
Loan impairment charges remain high

After the very large impairment charges in 2009, 2010 showed signs of a reversal of the trend, although the level of impairment charges remained relatively high, cf. Chart 4. Several banking institutions reported that especially small and medium-sized enterprises have had difficulty in adjusting to the changing market conditions.

In group 1, the total impairment ratio in 2010 was 1.0 per cent against 1.8 per cent in 2009. The corresponding figures for group 2* were 1.8 per cent in 2010 against 2.4 per cent in 2009.

The banking institutions' ability to absorb impairment charges and losses mainly depends on their earnings capacity. In this context, the earnings capacity is calculated as earnings before tax and impairment charges as a ratio of loans and guarantees. During 2009 and 2010, the earnings capacity for group 1 was in the range of 1.6-1.8 per cent of loans, while the impairment ratio was 1.0-1.8 per cent. In the 4th quarter of 2010, the earnings capacity was approximately 0.5 per cent of loans and guarantees, of which 0.3 percentage points were used to cover impairment charges, cf. Chart 4. In group 2*, earnings were sufficient to cover the group's loan impairment charges only in the 1st quarter. The figures mask a certain degree of variation among the banking institutions, particularly in group 2*. Earnings adjusted for value adjustments provide a slightly more stable measure of earnings capacity. In some quarters, earnings are in-

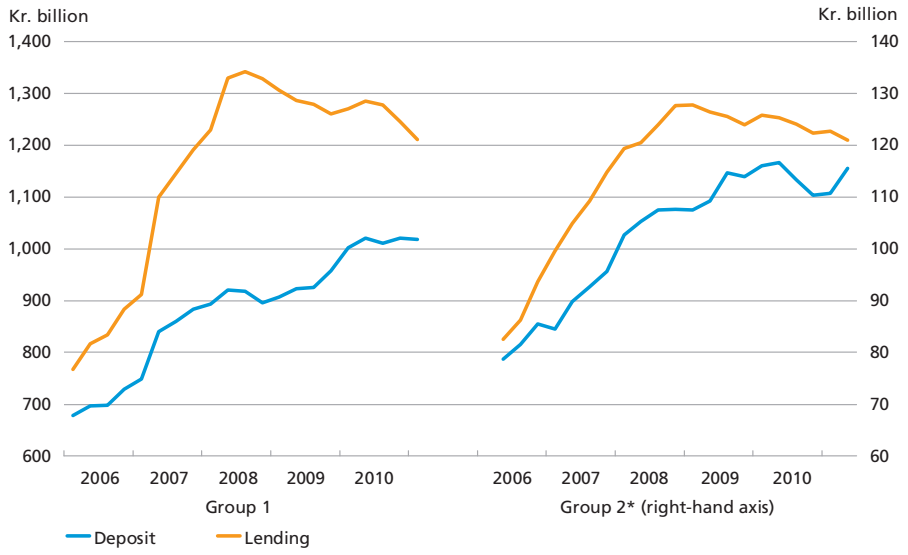
IMPAIRMENT CHARGES ON LOANS AND GUARANTEES AND THE BANKING INSTITUTIONS' EARNINGS CAPACITY — Chart 4



Note: Loan impairment charges and earnings are calculated as a percentage of loans and guarantees before impairments. Impairment charges and earnings in individual quarters have not been annualised.

Source: Danish Financial Supervisory Authority.

DEVELOPMENTS IN DEPOSITS AND LENDING — Chart 5



Note: Lending calculated before impairment charges. The data includes loans to and deposits from all non-financial customers.
Source: Danmarks Nationalbank.

fluenced by substantial non-recurring items, including impairment charges on goodwill.

Lending by banking institutions fell

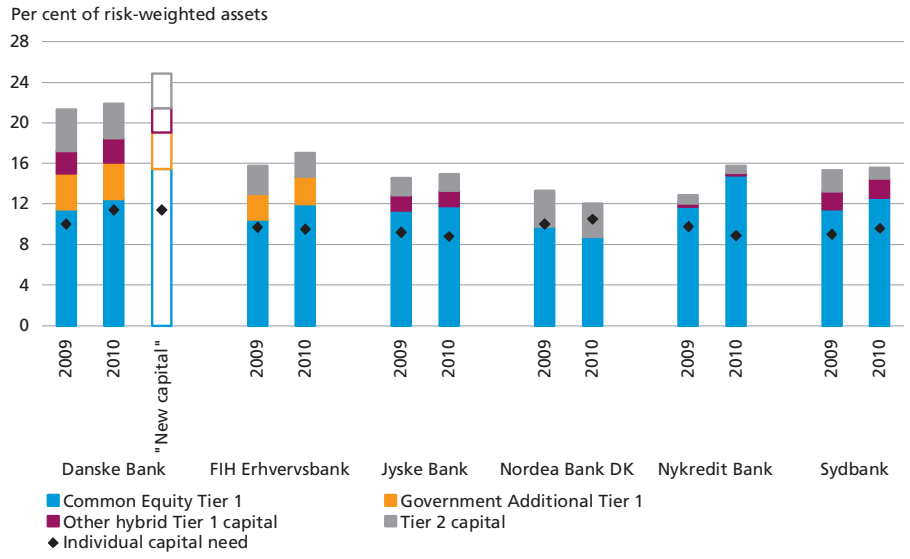
Total lending, excluding lending to credit institutions, increased in group 1 from kr. 1,632 billion at end-2009 to kr. 1,747 billion at end-2010, equivalent to an increase of 7 per cent. Excluding lending to other financial enterprises, this was a decrease by 1 per cent, cf. Chart 5, masking a decrease of 5 per cent in loans to the corporate sector and an increase of 3 per cent in loans to households. Deposits rose by 7 per cent, with almost uniform growth in respect of both corporate customers and households. In the 1st quarter of 2011, lending in group 1 continued to fall, while deposits remained unchanged. In comparison, Group 2* saw lending fall by 3 per cent in 2010, while deposits decreased by 5 per cent.

For groups 1 and 2, the customer funding gap was generally reduced, cf. Chapter 2.

Wide variations in the capital bases of the banking institutions

At the end of 2010, there were wide variations among the Danish banking institutions in terms of the size and quality of their capital, cf. Charts 6 and 7. In 10 of the 15 banking institutions the total capital ratio

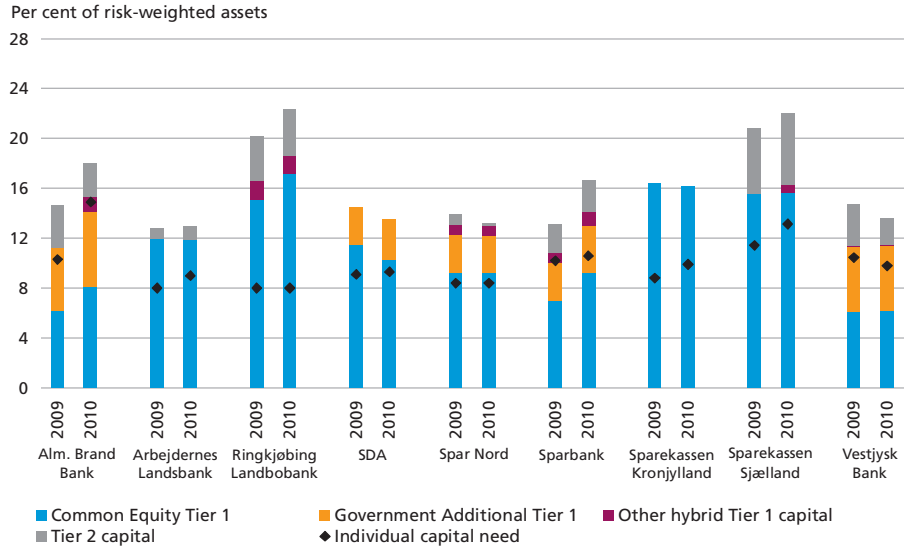
CAPITAL, BANKING INSTITUTIONS IN GROUP 1 Chart 6



Note: "New capital" for Danske Bank is calculated on the basis of the banking institution's capital base as at 31 December 2010 with the addition of the proceeds from a share issue in the spring of 2011.
Source: Danish Financial Supervisory Authority, Danske Bank.

increased in 2010. The government capital injections constituted a significant part of the capital base in several banking institutions and in a few cases were decisive for their compliance with the individual capital

CAPITAL, BANKING INSTITUTIONS IN GROUP 2* Chart 7



Note: SDA is short for Sammenslutningen af Danske Andelskasser.
Source: Danish Financial Supervisory Authority.

need. However, most of the banking institutions were able to meet the capital need by their Common Equity Tier 1 (core Tier 1) alone.

In Nykredit Bank, Alm. Brand Bank and Sparbank Common Equity Tier 1 capital increased considerably in the course of 2010. Nykredit Bank received a capital injection from Nykredit Realkredit, while the bank's risk-weighted assets were considerably lower at end-2010 than the sum for Nykredit Bank and Forstædernes Bank at end-2009. Alm. Brand Bank also received capital from its parent company, while Sparbank's higher capital was primarily attributable to the bank's sale of branches.

In the spring of 2011, Danske Bank launched a share issue providing proceeds of kr. 19.8 billion[1], thereby substantially improving its capital adequacy. When comparing the capital base of Danske Bank with the capital bases of the other banking institutions in groups 1 and 2*, it should be noted that Danske Bank is subject to a higher statutory capital requirement at group level, corresponding to an addition of approximately 2 percentage points of the individual capital need of the parent company.

The banking institutions' capital must be able to resist losses of a certain magnitude. Experience from the financial crisis shows that it is essential that the banking institutions hold more capital than required by the current rules and that they focus on improving the capital quality.

The larger the capital and the better the quality, the more freedom of action the banking institutions will have in situations like the financial crisis with major losses and nervousness in the capital markets. A large capital of good quality enhances the possibilities of attracting investors, while the opposite situation may result in a negative spiral with investors opting out or the price rising excessively. In such case the banking institutions' only option is to sell off activities, thereby possibly causing a further decrease in earnings. It is therefore important that the banking institutions adapt their capital bases to the new market conditions.

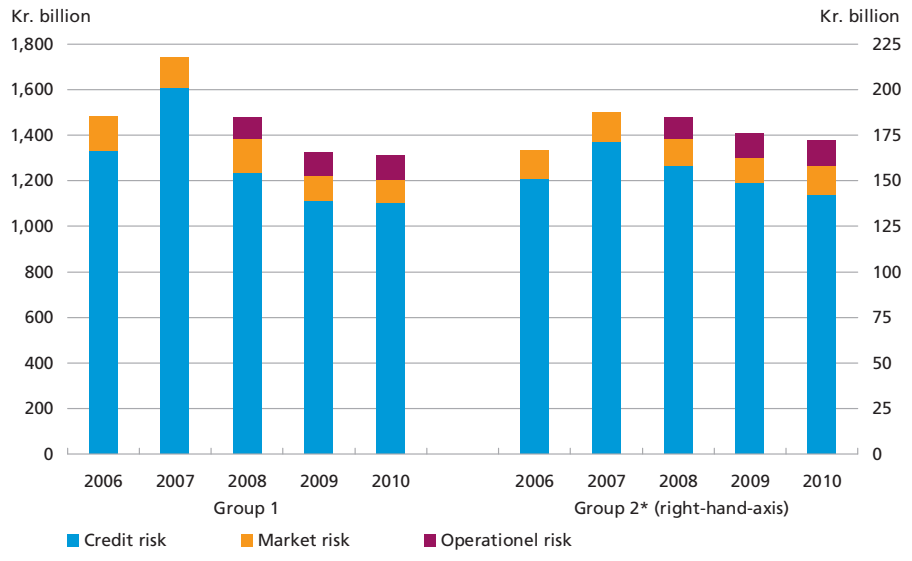
In December 2010, the Basel Committee on Banking Supervision proposed a new regulatory framework in this area, and the European Commission is expected to table similar proposals in 2011, cf. Chapter 6.

Unchanged level of risk-weighted assets

Overall, the level of risk-weighted assets was practically unchanged from 2009 to 2010, cf. Chart 8. The level of risk-weighted assets entailing credit risks was unchanged in group 1, but fell by 5 per cent in group 2*. In group 1, the risk-weighted assets entailing market risk decreased by 9 per cent, while they rose by 18 per cent in group 2*. Risk-weighted assets

[1] Danske Bank has announced that it would like to spend the proceeds from the share issue on premature redemption of government Additional Tier 1 capital in the amount of kr. 24 billion.

RISK-WEIGHTED ASSETS BROKEN DOWN BY RISK TYPES Chart 8



Note: Risk-weighted assets as at 31 December. As from 2008, risk-weighted assets have been calculated according to the Basel II rules. The transition to the Basel II rules had the greatest impact for institutions that use internal ratings based models for the measuring of credit risks.
Source: Danish Financial Supervisory Authority.

entailing operational risk increased by 5 per cent in group 1 and 8 per cent in group 2*.

An increase in the level of interest rates from the low level at present would have a positive impact on the current earnings of the banking institutions by way of wider interest-rate margins. On the other hand, higher interest rates would also lead to an immediate negative adjustment of the fair value of their positions. In general, this interest-rate risk is very low. Measured in relation to the impact of a parallel shift in the yield curve of plus 1 percentage point, all banking institutions in groups 1 and 2* except one reduced their interest-rate risk in the course of 2010.

Credit exposures

In group 1 loans and guarantees were distributed as follows: 2.5 per cent for public authorities, 66.9 per cent for the corporate sector and 30.5 per cent for households, cf. Table 1. In group 2* the distribution was 0.9 per cent for public authorities, 63.1 per cent for the corporate sector and 36.0 per cent for households. Group 2* is far more exposed to agriculture, hunting, forestry and fisheries than group 1.

Lending to the property sector was the direct cause of several banking institutions failing during the financial crisis, cf. Box 6 in Chapter 3. In group 1, the exposure to the property sector constituted 10.5 per cent of

LOANS AND GUARANTEES BROKEN DOWN BY SECTORS — Table 1

Per cent	Group 1	Group 2*
Public authorities	*2.5*	*0.9*
Agriculture, hunting, forestry and fisheries	3.0	10.0
Industry and raw materials extraction	7.2	2.7
Energy supply	1.3	3.5
Construction	2.0	3.5
Trade	4.7	6.1
Transport, hotels and restaurants	3.7	2.7
Information and communication	0.9	0.4
Financing and insurance	28.0	13.5
Real estate	10.5	12.6
Other sectors	5.6	8.2
Total sectors	*66.9*	*63.1*
Private	*30.5*	*36.0*
Total	*100.0*	*100.0*

Note: Loans and guarantees (before impairment charges) as at 31 December 2010. The reporting was made according to a new industrial classification (Danish Industrial Classification 2007). Consequently, direct comparison with previous years is not possible.
Source: Danish Financial Supervisory Authority.

total loans and guarantees, while the equivalent figure for group 2* was 12.6 per cent.

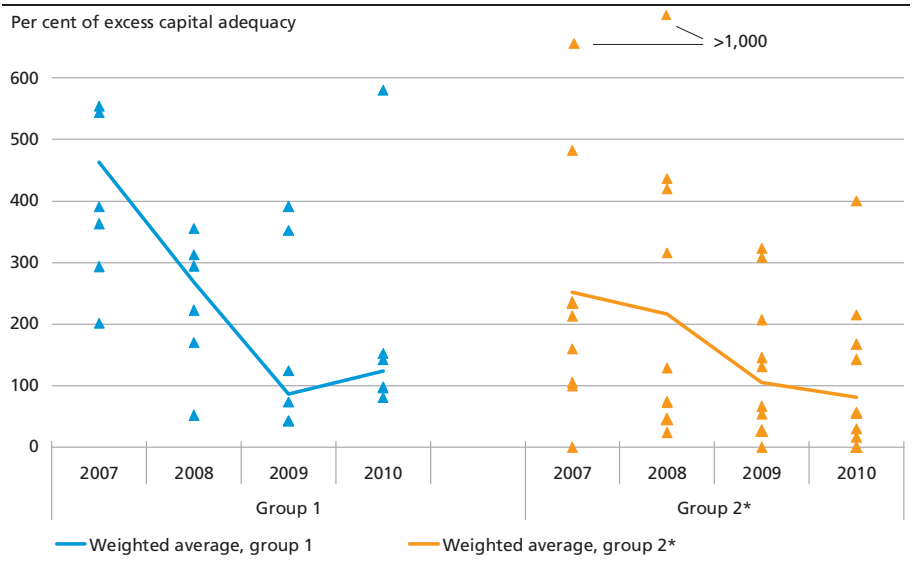
Since the beginning of 2010, there has been extensive international focus on the banking institutions' exposures to EU member states countries with large budget deficits and high government debt. The Danish banking institutions are only to a very limited extent exposed to EU member states with a credit rating below AAA/Aaa, cf. Table 2. The exposures to Ireland can essentially be attributed to Danske Bank's Irish banking activities, cf. Box 9 in Chapter 4.

EXPOSURES TO EU MEMBER STATES WITH CREDIT RATINGS BELOW AAA/Aaa — Table 2

Kr. million	Bonds	Lending	Total
Belgium	954	10,420	11,374
Greece	441	299	740
Ireland	4,021	83,269	87,290
Italy	1,507	633	2,140
Portugal	841	78	919
Spain	6,913	2,445	9,357
Total	*14,676*	*97,144*	*111,821*
Per cent of total bonds and lending	*0.5*	*3.6*	*4.2*

Note: Exposures in groups 1 and 2* as at 31 December 2010.
Source: Danmarks Nationalbank.

SUM OF LARGE EXPOSURES Chart 9



Note: Calculated on the basis of the Danish Financial Supervisory Authority's key ratio for total large exposures and the individual capital need.
Source: Danish Financial Supervisory Authority.

The banking institutions' large exposures are usually calculated as a ratio of the capital base. To gain an impression of the concentration of exposures relative to the banking institutions' buffers, the sum of large exposures has been calculated as a ratio of the excess capital adequacy, cf. Chart 9. The rules on calculation of large exposures were changed at end-2010, and comparisons with key ratios for previous years must therefore be made with this caveat. As a result of the changes, exposures to credit institutions that used to be weighted by 20 per cent must now be weighted by 100 per cent. The sum of large exposures in group 1 rose from kr. 89.8 billion in 2009 to kr. 120.0 billion in 2010. In group 2* the sum of large exposures fell from kr. 10.8 billion in 2009 to kr. 7.8 billion in 2010.

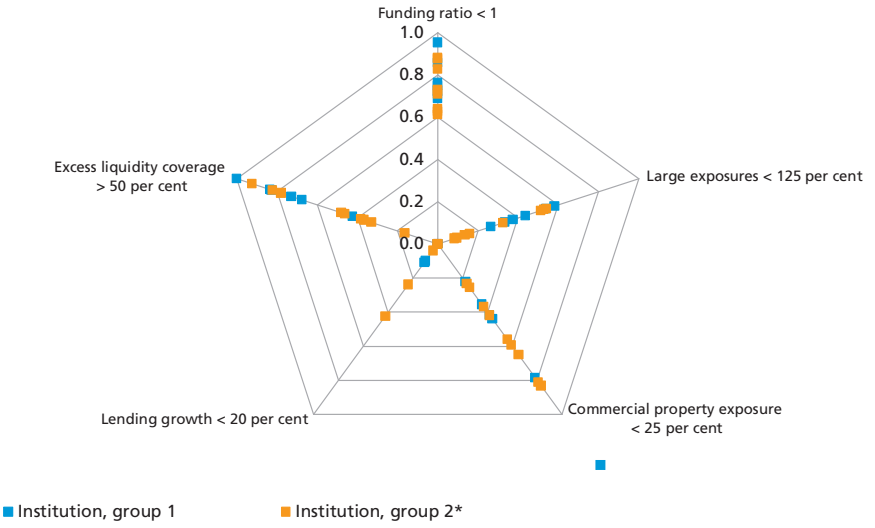
The banking institutions have generally focused on reducing the concentration of exposures, achieving this in relation to the 2007 level. However, there continues to be considerable variation across the banking institutions in group 2*.

The Danish Financial Supervisory Authority's Supervisory Diamond

In June 2010 the Danish Financial Supervisory Authority introduced the "Supervisory Diamond", stipulating explicit limit values for five benchmarks:

- Large exposures as per cent of capital base (less than 125 per cent of the capital base)
- Lending growth (less than 20 per cent per year)

INSTITUTIONS IN GROUPS 1 AND 2* RELATIVE TO THE LIMIT VALUES OF THE SUPERVISORY DIAMOND — Chart 10



Note: The Chart shows the institutions' key ratios as at 31 December 2010 relative to the limit values of the Supervisory Diamond. Excess liquidity coverage is shown on an inverse scale with the edge of the diamond corresponding to excess coverage of 50 per cent and the centre of the diamond corresponding to excess coverage of 400 per cent.
Source: Danish Financial Supervisory Authority and Danmarks Nationalbank.

- Property exposure (less than 25 per cent of total loans and guarantees)
- Stable funding (funding ratio of less than 1)[1]
- Excess liquidity coverage (greater than 50 per cent)

In principle, the banking institutions must comply with the limit values from the end of 2012. It is the Danish Financial Supervisory Authority's intention to initiate systematic monitoring of the Supervisory Diamond benchmarks, which will be included in the planning of the Danish Financial Supervisory Authority's supervisory activities. The Danish Financial Supervisory Authority has encouraged the banking institutions' boards of directors – during the period up to the end of 2012 – to consider the benchmarks and to implement strategies that may prevent the banking institutions from exceeding the limit values.

At the end of 2010, all banking institutions in groups 1 and 2* except one were within the limit values of the Supervisory Diamond, cf. Chart 10. The banking institution concerned had a property exposure of 34 per cent. The banking institution states in its annual report that as a result of a new business strategy it expects to comply with the limit value by the end of 2012.

[1] Funding ratio = lending/(working capital less bond issuance with a remaining maturity of less than 1 year).

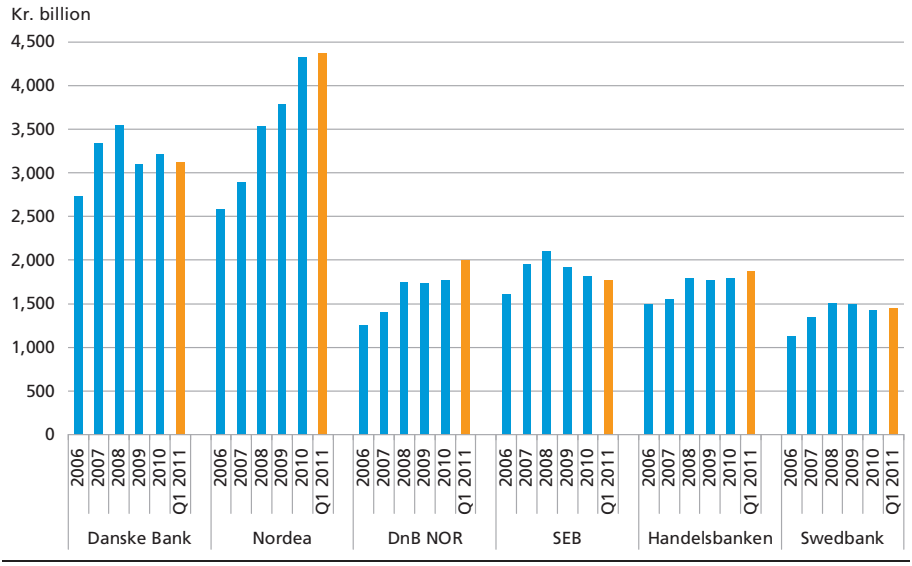
THE NORDIC GROUPS

Nordea and Danske Bank are the largest banking groups in the Nordic region, cf. Chart 11. In the course of 2010 Nordea expanded its balance sheet by 14 per cent, while the other groups experienced relatively modest growth or reductions. The same pattern was seen in the 1st quarter of 2011.

Increasing earnings in all six groups in 2010 improved the return on equity, cf. Chart 12. The primary reason was lower loan impairment charges, but there were wide variations in the groups' earnings. For Danske Bank the return on equity remained under 10 per cent. In general, net income from interest decreased due to lower deposit margins and rising funding costs, while net fee income rose, primarily as a result of increasing securities activities. Value adjustments and trade income were lower than the very high income in 2009. The positive developments in the four Swedish banking groups continued in the 1st quarter of 2011, while the return on equity fell in DnB Nor and Danske Bank.

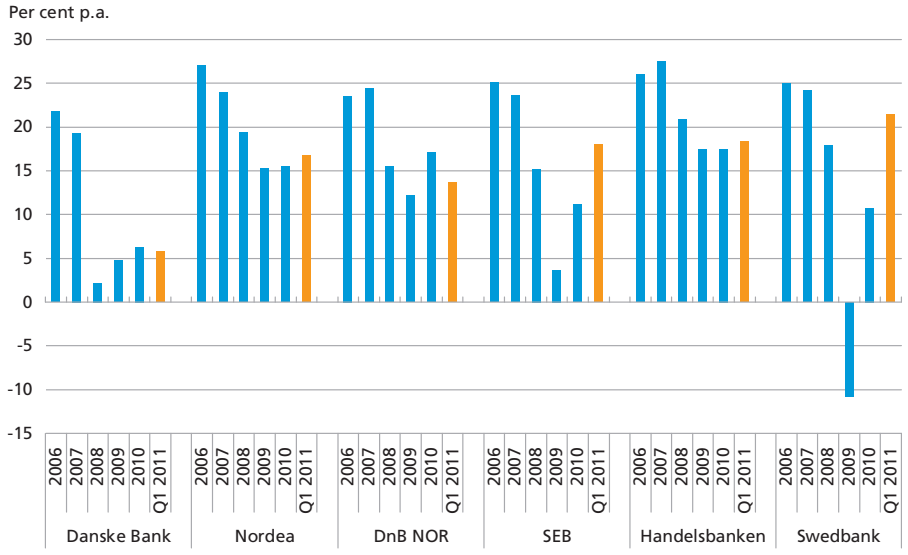
Loan impairment charges declined considerably in 2010, cf. Chart 13, but relatively high charges were still posted in some geographical areas. In Sweden and Norway, the level was relatively low, while the need for impairment charges in Denmark continued to be influenced by the economic downturn, and small and medium-sized enterprises in particular

TOTAL ASSETS FOR THE NORDIC BANKING GROUPS — Chart 11



Note: Total assets as at 31 December. The total assets have been converted into Danish kroner for all years based on the exchange rate as at 31 March 2011.
Source: Financial statements.

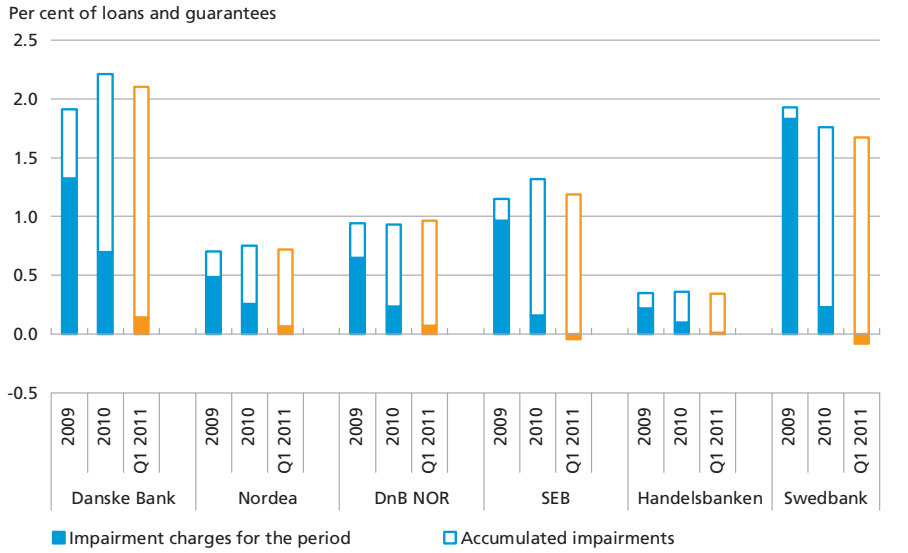
RETURN ON EQUITY FOR THE NORDIC BANKING GROUPS Chart 12



Note: Return on equity before tax calculated on the basis of the average equity at the beginning and end of the year.
Source: Financial statements.

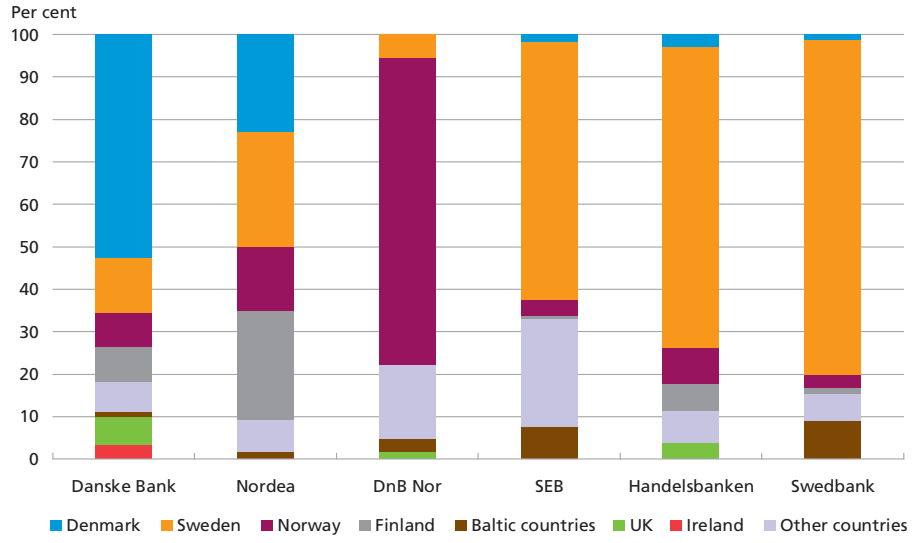
were having financial difficulties. In addition, Danske Bank's financial performance was affected by very high impairment charges in Ireland and the UK (including Northern Ireland).

IMPAIRMENT CHARGES ON LOANS AND GUARANTEES Chart 13



Note: The size of accumulated impairment charges is illustrated by the sum of the two types of bars. Impairment charges in the 1st quarter of 2011 are illustrated by the yellow bars and have not been annualised.
Source: Financial statements.

CREDIT EXPOSURES ACROSS GEOGRAPHICAL AREAS, END-2010 Chart 14



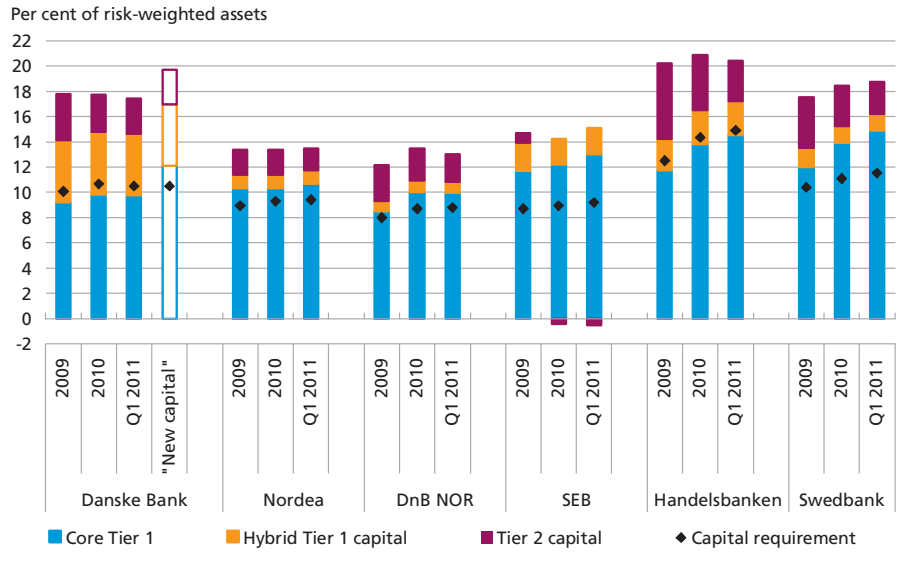
Note: Financial statements and risk reports.

The differences are also reflected in considerable variation in the amount of accumulated impairments (the allowance account) among the groups. The sectoral distribution of loans and the value of assets pledged as collateral are key determinants for the credit quality of the lending portfolio. Danske Bank's portfolios in Ireland and the UK (including Northern Ireland) totalled 10 per cent of the group's credit exposures, cf. Chart 14. For SEB and Swedbank the portfolios in the Baltics constituted 8 and 9 per cent, respectively, of the groups' credit exposures. For SEB, the group "other countries" includes a considerable portfolio of 23 per cent in Germany.

Five of the Nordic banking groups strengthened their Common Equity Tier 1 ratio during 2010, while Nordea maintained its ratio unchanged, cf. Chart 15 Danske Bank's share issue in the spring of 2011 increased the group's Common Equity Tier 1 by kr. 19.8 billion.

The banking institutions are under pressure from several parties to strengthen their capital bases and improve the capital quality. The Swedish authorities have submitted a proposal that enables a tightening of the regulation to prevent the capital requirement from being reduced in 2012 with the expiry of the transitional rules for Basel II – only to be raised again in 2013 or later on introduction of Basel III. The proposal has not yet been adopted, but the current capital requirement for Swedish banking groups, including transitional rules, must be expected to apply also in 2012. The pressure for increased capital adequacy does not stem from the authorities alone but also from the rating agencies and the international capital markets.

CAPITAL ADEQUACY OF THE NORDIC BANKING GROUPS Chart 15



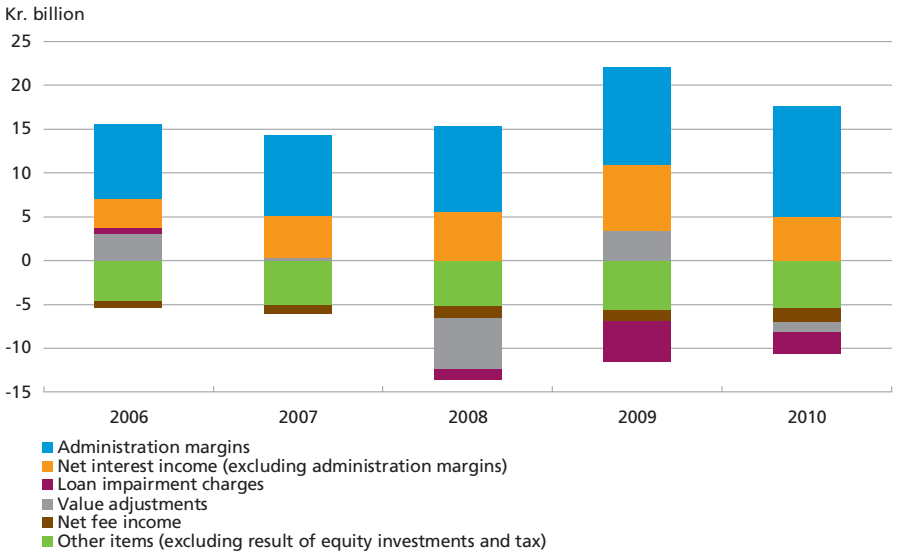
Note: Calculated on the basis of risk-weighted assets compiled according to the Basel II rules, i.e. excluding additional capital requirement according to transitional rules. Capital requirements include transitional requirements and are calculated as a percentage of risk-weighted items before the transitional rules. Only Danske Bank has published its individual capital need. It is assumed that capital requirements including transitional requirements cover the individual capital needs of the other groups. "New capital" in Danske Bank is calculated on the basis of the capital adequacy as at end-March 2011 with the addition of a share issue of kr. 19.8 billion in the spring of 2011.
Source: Financial statements and risk reports.

MORTGAGE-CREDIT INSTITUTES

In 2010 the mortgage-credit institutes posted total profits before tax (excluding the income from subsidiaries and associated companies) of kr. 6.9 billion against kr. 10.4 billion in 2009. The lower profits are primarily attributable to a decline in value adjustments from kr. 3.4 billion to a negative kr. 1.2 billion in 2010, cf. Chart 16. This should be viewed in the light of extraordinarily high value adjustments in 2009 due to a decline in the level of interest rates. Income from administration margins rose from kr. 11.1 billion in 2009 to kr. 12.5 billion in 2010. The increase is the result of several banking institutions raising their administration margins as well as continued lending growth.

Loan impairment charges fell from kr. 4.6 billion in 2009 to kr. 2.4 billion in 2010, reducing the impairment ratio from 0.2 to 0.1 per cent. Despite falling property prices, impairment charges have been at a low level throughout the crisis. The development in impairments followed the development in the arrears ratio, cf. Chart 17. The arrears ratio for owner-occupied dwellings fell from 0.6 per cent in 2009 to 0.4 per cent in the course of 2010.

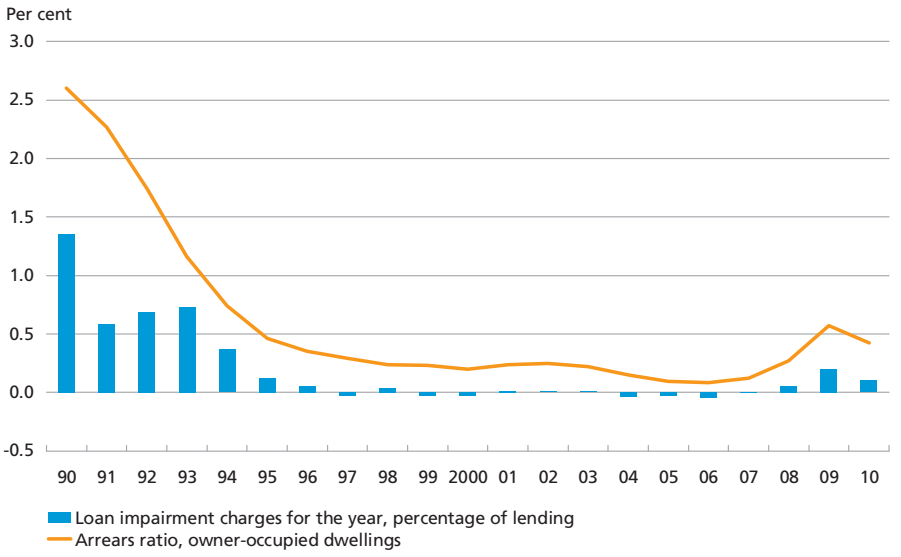
EARNINGS BROKEN DOWN BY MAIN ITEMS — Chart 16



Note: The result of equity investments in associated and affiliated companies has been left out in order to better reflect earnings from the institutions' mortgage activities.
Source: Danish Financial Supervisory Authority.

Total lending by mortgage-credit institutes constituted kr. 2,407 billion at the end of 2010 against kr. 2,325 billion at the end of 2009, equivalent to a 3.5 per cent increase. In value terms the increase in mortgage-

LOAN IMPARMENT CHARGES AND ARREARS RATIO — Chart 17



Note: The arrears ratio shows the share of the total payments which had not been made within 3½ months of the September settlement date at the latest.
Source: The Danish Financial Supervisory Authority, the Association of Danish Mortgage Banks and the Danish Mortgage Banks' Federation.

credit institutes' lending to the corporate sector was not quite as large as the decline in banking institutions' lending to the corporate sector. The mortgage-credit institutes' total lending was distributed as follows: 59 per cent for owner-occupied dwellings and holiday homes, 12 per cent for industry, trade, businesses and offices, etc., 12 per cent for agriculture and 18 per cent for other property categories.

At the end of 2010, the capital base of the mortgage-credit institutes amounted to between 12.0 and 39.4 per cent of risk-weighted assets. Five of the mortgage-credit institutes are approved to use internal ratings-based methods to calculate risk-weighted assets. Those institutions are comprised by the transitional rules and thus subject to a raised capital requirement until the end of 2011. Allowing for the requirements under the transitional rules, the mortgage-credit institutes' excess capital adequacy constituted between 1.9 and 20.4 per cent of risk-weighted assets. The fact that a few institutions had relatively low excess capital adequacy should be viewed in the light of the institutes concerned belonging to large financial groups and therefore might be having relatively easy access to further capital from their parent companies.

2. Liquidity and Funding Conditions

The banking institutions have almost halved their customer funding gap since end-2008, but challenges remain considerable. This particularly applies to small and medium-sized institutions, which have to a large extent issued debt with individual government guarantees. A number of these institutions have to refinance large parts of their balance sheets in the years ahead and should already begin to prepare for the expiry of the government guarantees, which also implies considering their business models. For some institutions, the most viable solution will be to trim the balance sheet or to aim for a merger.

The new winding-up scheme under Bank Rescue Package 3 was used for the first time in February 2011, when Amagerbanken failed. The credit rating agency Moody's has subsequently downgraded several Danish banking institutions. Among the reasons stated by Moody's is that the use of the new winding-up scheme has given rise to a reassessment of the probability of intervention by the Danish government to save a failing banking institution without losses to creditors. The fact that investors are at risk of suffering losses if an institution fails means that the price of the banking institutions' financing to a higher degree reflects their risk profile. This gives the institutions an incentive to improve their individual financial strength and assume fewer risks. In the longer term this will contribute to a more robust sector and increased financial stability.

Competition for deposits has intensified for the small and medium-sized institutions, and there are indications that customers have spread their deposits in order to ensure coverage via the deposit guarantee scheme. This development can affect the small institutions' funding options.

The results of the Danish Financial Supervisory Authority's and Danmarks Nationalbank's liquidity stress tests still show that the majority of the institutions have sufficient liquidity to withstand several months with difficult liquidity conditions. As yet, the tests do not cover the periods of 2012 and 2013 when most of the government-guaranteed issuances expire.

The mortgage-credit institutes are becoming increasingly vulnerable to changed market conditions. The widespread use of adjustable-rate mortgages entails a significant refinancing risk because long-term loans are financed by issuing bonds with shorter maturities. The mortgage-credit sector is aware of the risk and has initiated a process to investigate how the refinancing risk can be reduced. Danmarks Nationalbank emphasises that the solutions found should be robust.

There has been a large increase in the outstanding volume of covered bonds, for which the requirement for underlying collateral must be met on an ongoing basis. If house prices fall, top-up collateral may be required, and the mortgage-credit institutes may need to issue junior covered bonds. If a decline in house prices coincides with a crisis in the financial markets, such issuance may be difficult or, at worst, impossible. Consequently, the mortgage-credit institutes should ensure that they have sufficient buffers. This could be done by issuing junior covered bonds beforehand, by reducing the loan-to-value ratio, or by restricting access to deferred amortisation.

BACKGROUND

The term liquidity is used both to describe credit institutions' ability to raise new funding (funding liquidity) and their ability to liquidate assets for liquid funds (asset liquidity). Difficulty in raising new funding could mean that institutions are compelled to sell assets at a considerable loss and, in the worst case, could result in the winding-up of an institution. The financial crisis has increased focus on the liquidity situation of the financial sector and also led to a number of new regulatory proposals in this area, cf. Chapter 6.

This chapter first describes the banking institutions' customer funding gap and the challenge posed by the institutions' funding in the years ahead.[1] Subsequently, the banking institutions' excess liquidity cover and stress tests are described. The last part of the chapter describes the mortgage institutions' funding conditions.

THE BANKING INSTITUTIONS' SOURCES OF FUNDING AND CUSTOMER FUNDING GAPS

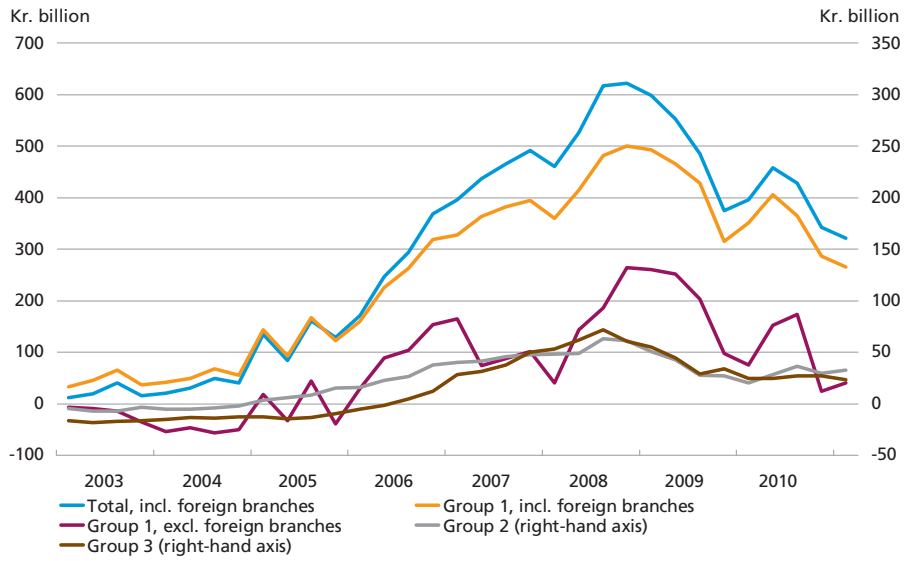
Banking institutions typically have three different sources of funding: deposits, debt to other credit institutions and issuance of bonds. Maturity, counterparty characteristics and other terms and conditions determine the stability of a given source of funding.

The customer funding gap has narrowed

The customer funding gap, defined as the difference between customer lending and deposits, is often used as an indicator of the extent to which banking institutions need to source funding by issuing debt or borrow

[1] For a broader review of the banking institutions' liquidity conditions, see Stress Tests, 2nd Half 2010. For an elaboration on the concept of liquidity, see Anne-Sofie Reng Rasmussen, Banks' Liquidity Management, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2010. Unless otherwise indicated, banking institutions in the Danish Financial Supervisory Authority's groups 1, 2 and 3 at presentation of accounts for 2010 are considered.

CUSTOMER FUNDING GAP Chart 18



Note: The customer funding gap is calculated as deposits less lending (before loan impairment charges including repo transactions). Both deposits and lending are stated for households and corporate customers excluding credit institutions. The most recent observations are from the 1st quarter of 2011.
Source: Danmarks Nationalbank.

from other credit institutions. The customer funding gap of the Danish banking institutions was built up during the years ahead of the crisis and rose sharply from 2005 to 2008, cf. Chart 18. This development was especially driven by customer funding gaps in the foreign branches of group 1.[1]

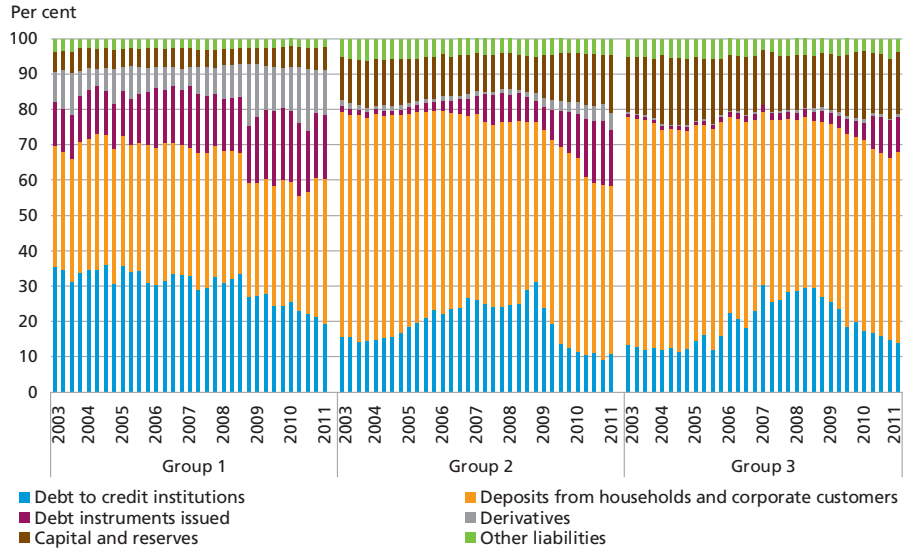
From the end of 2008 to the end of 2009 the gap narrowed considerably, primarily due to falling lending volumes, and since then it has been on a downward trend. Group 1 accounts for 83 per cent of the customer funding gap. This corresponds to kr. 266 billion. Groups 2 and 3 had a customer funding gap of kr. 56 billion at end-March 2011. Excluding institutions taken over by the Financial Stability Company, the customer funding gap for these groups totalled kr. 21 billion. The aggregate customer funding gaps of the groups mask considerable divergence, some banking institutions have customer funding surpluses, while others have substantial gaps, cf. Appendix 2.

Uncollateralised senior debt and foreign investors

Debt instruments have gained increasing importance in relation to banking institutions' funding. For the banking institutions overall, debt instruments accounted for 18 per cent of the balance-sheet total at the end of

[1] For a more detailed description of the customer funding gap and compilation methods, see *Stress Tests*, 2nd half 2010.

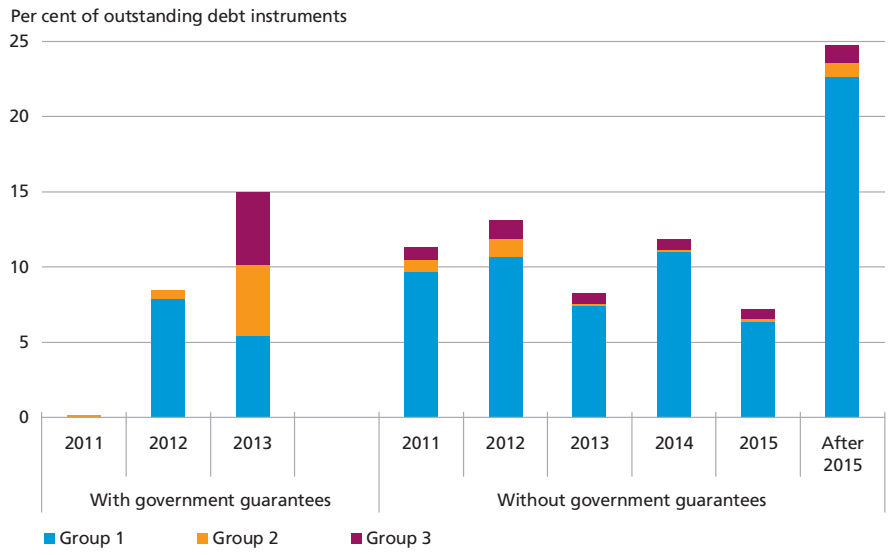
COMPOSITION OF BANKING INSTITUTIONS' LIABILITIES, BY GROUP — Chart 19



Note: The most recent observations are from the 1st quarter of 2011. Derivatives are stated at market value.
Source: Danmarks Nationalbank.

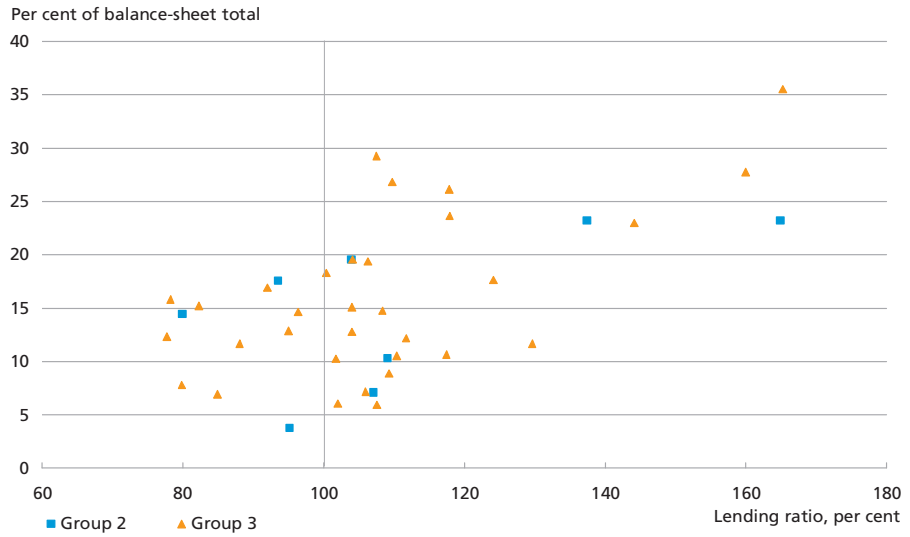
the 1st quarter of 2011 versus 11 per cent in 2003. For banking institutions in groups 2 and 3, the debt instruments' share of the balance-sheet total has risen from 1 to 13 per cent, cf. Chart 19.

MATURITY PROFILE FOR DEBT INSTRUMENTS WITH AN ORIGINAL MATURITY OF MORE THAN 1 YEAR WITH AND WITHOUT GOVERNMENT GUARANTEES — Chart 20



Note: Covers issuances up to and including end-March 2011. One institution has issued bonds with individual government guarantee maturing in 2011.
Source: Danish Financial Supervisory Authority, Danmarks Nationalbank and Financial Stability Company.

LENDING RATIO AND GOVERNMENT-GUARANTEED ISSUANCES AS A PERCENTAGE OF THE BALANCE-SHEET TOTAL, END OF 1ST QUARTER 2011 Chart 21



Note: Lending before loan impairment charges. Comprises banking institutions in groups 2 and 3, except those transferred to the Financial Stability Company. The lending ratio is calculated as lending as a percentage of deposits. Lending and deposits are stated for households and corporate customers excluding credit institutions.
Source: Financial Stability Company and Danmarks Nationalbank.

More than half of the banking institutions' long-term debt issuances (with maturities exceeding 1 year) matures over the next three years, cf. Chart 20. The highest level of redemptions in a single year is in 2013, when debt totalling approximately kr. 140 billion matures. The main reason is that, until the end of 2010, banking institutions had the option to apply for permission to issue under individual government guarantees, with expiry between 2011 and 2013.[1]

The banking institutions in group 1 have in previous years issued debt of the same magnitude as that maturing in 2013 and several group 1 institutions have sourced funding without government guarantees in the first months of 2011. Institutions in groups 2 and 3, however, have not previously issued debt to the same extent as they did in 2009 and 2010, when issuance of debt with individual government guarantees was an option. Since the expiry of the general government guarantee on 1 October 2010 they have issued only little debt. The challenge in relation to refinancing this debt is amplified because several institutions will need to issue debt at the same time. For a few group 2 and 3 institutions, issu-

[1] At 31 December 2010, 50 institutions had issued for a total of kr. 193 billion with individual government guarantees, including issuance by mortgage-credit institutes and Faroese banking institutions, cf. www.finansielstabilitet.dk. Since October 2010, issuances with individual government guarantees for a total of kr. 11 billion have been prematurely redeemed or cancelled. Half of this amount is attributable to redemption of issuances by Eik Banki P/F and its subsidiary, Eik Bank Danmark A/S, which were transferred to the Financial Stability Company at the end of September 2010. The other premature redemptions were primarily made by small banking institutions.

ances with government guarantees exceed 25 per cent of their balance-sheet totals, cf. Chart 21.

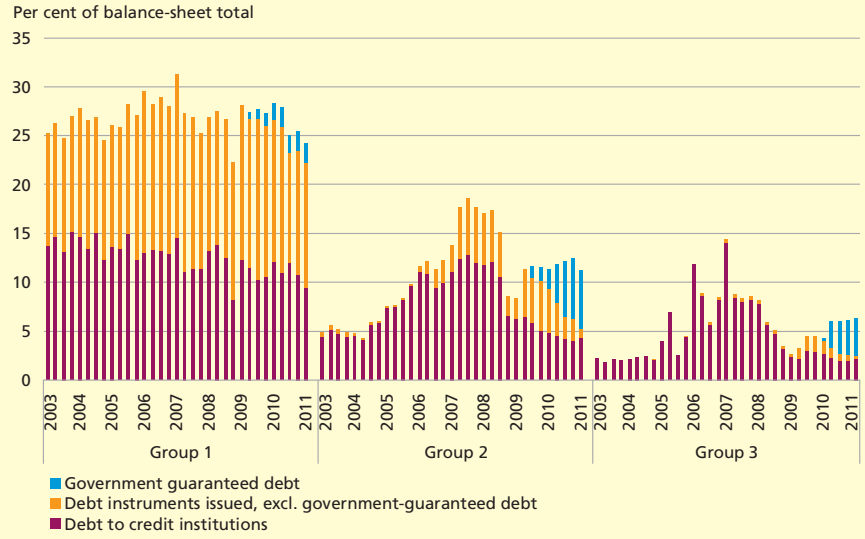
One third of the institutions which have issued debt with individual government guarantees have customer-funding surpluses. These institutions might have built up buffers against the risk of losing deposits at the expiry of the general government guarantee, and their need to refinance the government-guaranteed issuances is probably lower than for institutions with a customer funding gap. For the remaining two thirds of the banking institutions, debt issuances with individual government guarantees have contributed to financing a customer funding gap.

NON-RESIDENTS' FUNDING OF DANISH BANKING INSTITUTIONS — Box 2

From 2005 and until the financial crisis, non-residents' funding of Danish banking institutions increased steadily, followed by a sharp decline in the 4th quarter of 2008. Especially debt to credit institutions was reduced after the crisis. Since early 2009, non-residents' funding of small institutions has risen again as a consequence of foreign investors' purchases of government-guaranteed issuances, cf. the Chart. These investors own more than half of the total issuances with individual government guarantees.

Non-residents' funding has been more or less constant for group 1, except at the peak of the crisis. For groups 2 and 3, it tripled and doubled, respectively, in the period leading up to the crisis. For group 2, not only debt to credit institutions but also non-residents' investments in debt instruments issued rose somewhat.

DEBT TO FOREIGN CREDIT INSTITUTIONS AND DEBT INSTRUMENTS ISSUED OWNED BY FOREIGN INVESTORS



Note: Debt to credit institutions excluding central banks. Non-residents' holdings of SPV issuances are included in government-guaranteed funding and have been estimated on the basis of data relating to residents' holdings of such debt instruments at end-December 2010. From June 2009 onwards, data from the Securities statistics has been used for debt instruments issued. The most recent observations are from the 1st quarter of 2011.

Source: Danmarks Nationalbank.

More than half of the government-guaranteed issuances are owned by non-residents, and for some of the small institutions the government-guaranteed issuances are their only funding by non-residents, cf. Box 2. As government-guaranteed issuances differ very much from the banking institutions' other debt issuances from a risk and return perspective, the current investors in government-guaranteed issuances will not necessarily be interested in investing in new debt issuances without government guarantees.

Foreign investors are expected to reduce exposures on Danish banking institutions faster in the event of uncertainty than domestic investors, partly because it can be disproportionately resource-intensive for foreign investors to keep up to date with Danish and institution-specific conditions. It is to a large extent up to the institutions themselves to meet the information needs of foreign investors, and this can be a considerable challenge, particularly for the small institutions. This means that foreign funding could imply an increased refinancing risk.

The issuance of long term debt instruments can contribute to a reduction in a banking institution's refinancing risk. However, certainty of continued access to the capital markets set high demands on the institutions. Institutions without this certainty that are dependent on this source of funding can be vulnerable if it becomes inaccessible in the future. The banking institutions that are dependent on funding with individual government guarantees must begin to prepare for the expiry of the guarantee already now by ensuring access to the necessary funding without government guarantees. The institutions will have to take precautions to avoid situations in which refinancing of debt is not possible. Some institutions should consider whether their business model is viable in the longer run. For some institutions, the most viable solution will be to trim the balance sheet or to aim for a merger. In 2011, the Danish Financial Supervisory Authority will request a number of institutions to prepare action plans for tackling this challenge.

Credit ratings of Danish banking institutions

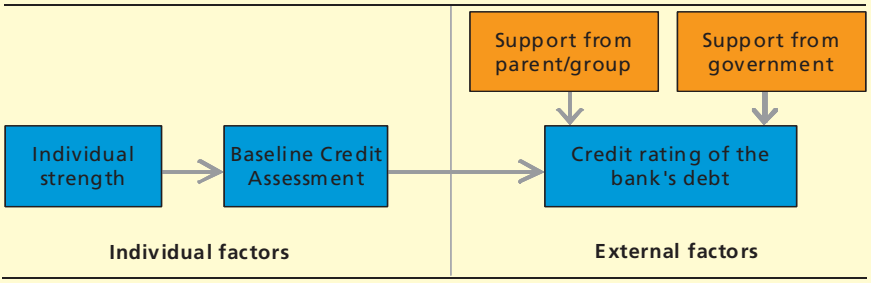
The new winding-up scheme under Bank Rescue Package 3 was used for the first time in February 2011, when Amagerbanken failed, cf. Appendix 1. The credit rating agency Moody's has subsequently downgraded several Danish banking institutions. Moody's bases its credit ratings on assessments of the banking institutions' individual financial strength as well as an assessment of the probability of external support from the owners and the government, cf. Box 3. Among the reasons stated by Moody's is that the use of the new winding-up scheme has given rise to a reassessment of the probability of intervention by the Danish government to save a failing

CREDIT RATING OF BANKING INSTITUTIONS Box 3

Banking institutions' credit ratings typically refer to the long-term ratings of senior debt. Ratings are stated on a scale where Aaa is the best rating and C the poorest.

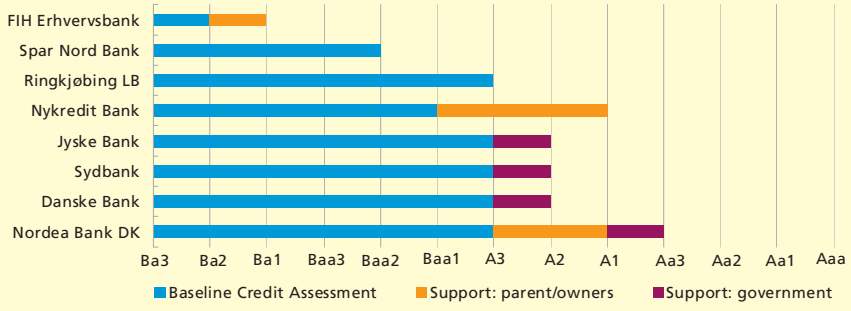
A long-term rating comprises two elements: the credit rating agency's assessment of the bank's individual financial strength which leads to the baseline credit rating and an assessment of the probability of external support from the group/owners and/or the government.

METHOD FOR BANKING INSTITUTIONS' RATING Chart A



The agencies supplement the rating with an indication of the direction of the rating in the short and long run, approximately 3 months and 1-2 years, respectively. The long-term indications are negative, stable and positive. The credit rating agency further states if the rating is under review for possible downgrade/upgrade.

MOODY'S LONG-TERM RATINGS OF DANISH BANKING INSTITUTIONS Chart B



Note: Credit ratings as at 19 May 2011.
Source: Moody's and the banking institutions' websites.

banking institution without losses to creditors. For some of the Danish banking institutions the downgrades are also based on the individual situations of the institutions including concerns on whether they can continue to obtain market based funding.

The fact that creditors are at risk of suffering losses if a banking institution fails implies that the price of the banking institutions' financing to a higher degree reflects their risk profile. This gives the banking institutions an incentive to improve their individual financial strength and

assume fewer risks, as credit rating agencies and investors will incorporate the institutions' individual risk profile in their assessment of the credit risk on the institution. In the longer term, this will contribute to a more robust sector and increased financial stability.

The current opportunities for Danish banking institutions to raise funding could be affected by other countries not having established similar winding-up schemes, or a perception among rating agencies that there is no political will to apply such schemes. It should be noted that Moody's is in the process of reassessing the probability of European banking institutions receiving government support if they are failing, as well as the effect on their credit ratings in the future. Danmarks Nationalbank attaches great importance to the European Commission's work to establish a common framework for crisis management.[1]

Danmarks Nationalbank has the fundamental view that no banking institution should be comprised by an implicit or explicit guarantee against failure. However, the consequences of the failure of a systemic institution could be so far-reaching that this is not a viable option in practice. This means that the requirements of such institutions, both in terms of regulation and supervision, should be so strict that the risk of failure is eliminated to the extent possible. This is a common interest that society must protect if the owners and management are not capable of doing so.

Fiercer competition for deposits

Deposits from households and corporate customers have constituted a relatively stable share of the banking institutions' liabilities, cf. Chart 19. The volume of deposits rose up to mid-2008, and subsequently stagnated, however, deposits in foreign branches have increased in the latest quarters. The most recent rise masks an increase in deposits, particularly from corporate customers, in group 1, while deposits from virtually all sectors except households declined for institutions in groups 2 and 3 – especially up to the expiry of the general government guarantee on 1 October 2010. This indicates that some corporate customers have either transferred deposits from small to large institutions or have chosen other investment options, e.g. securities. Demand deposits account for almost half of the total deposits, and have fallen in all groups since early 2010 cf. Chart 22.[2]

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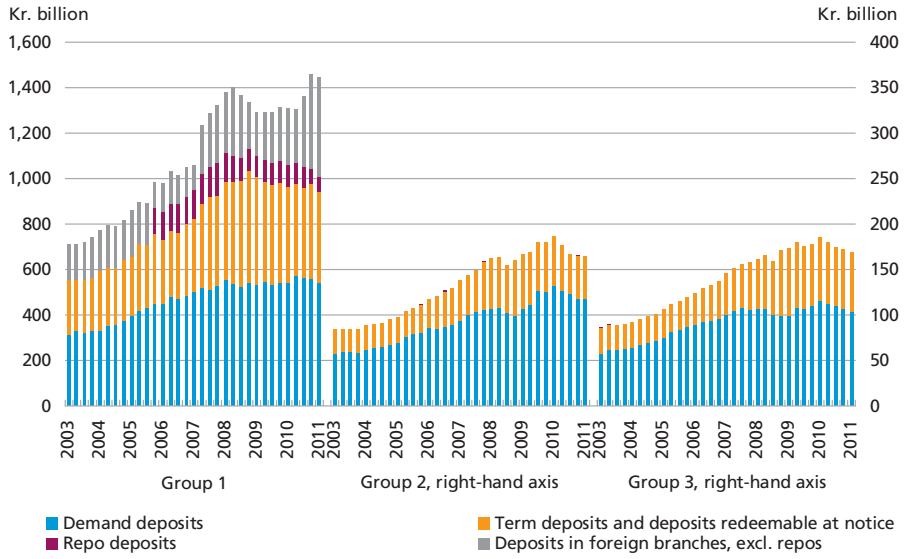
[1] Cf. Danmarks Nationalbank's response to the European Commission's 3 March 2011 public consultation on the technical details of a possible EU framework for bank recovery and resolution dated 4 March 2011.

[2] Some of the deposits in group 3 are from non-resident SPVs. This particularly relates to proceeds from debt issuances with individual government guarantees, for which several small banking institutions have issued debt jointly through an SPV.

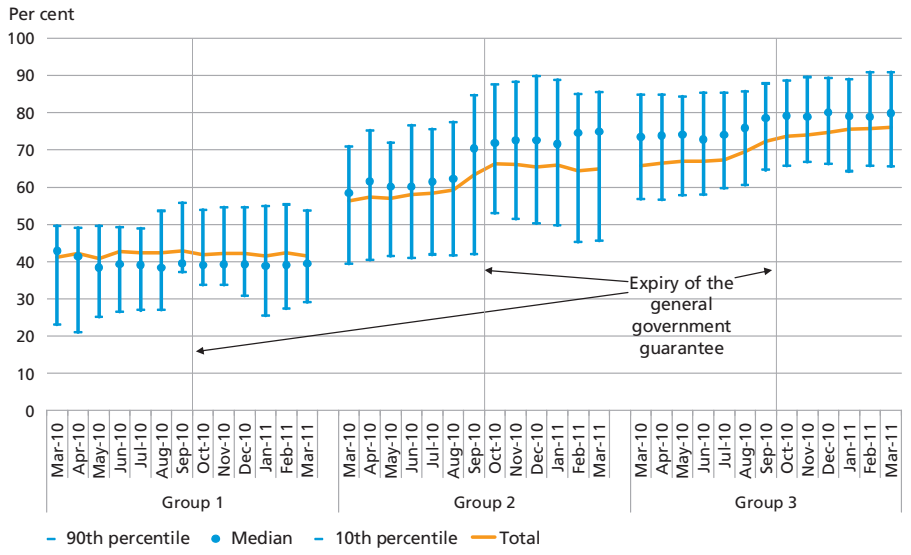
DEPOSITS FROM HOUSEHOLDS AND CORPORATE CUSTOMERS BY TYPE — Chart 22



Note: Comprises institutions with a balance-sheet total of at least kr. 500 million. Repo deposits for foreign branches have been annualised and linearly interpolated from 2005 onwards. The 1st quarter of 2011 has been assumed to be equal to the end of 2010. The most recent observations are from the 1st quarter of 2011.
Source: Danmarks Nationalbank, Danish Financial Supervisory Authority and Financial Stability Company.

Almost half of the total volume of deposits is covered by the deposit guarantee scheme. For the institutions in groups 2 and 3, this share increased by around 10 percentage points in 2010 in the period up to the

PERCENTAGE OF DEPOSITS COVERED BY DEPOSIT GUARANTEE SCHEME — Chart 23



Note: Forstædernes Bank has been added to group 1 as it merged with Nykredit in April 2010. Excluding institutions transferred to the Financial Stability Company.
Source: Danish Financial Supervisory Authority and Danmarks Nationalbank.

expiry of the general government guarantee, to 65 and 76 per cent, respectively, cf. Chart 23.

The share of deposits in group 1 covered by the deposit guarantee scheme was stable at 42 per cent during the entire period. Institutions in group 1 thus generally had the lowest coverage. The development indicates that customers have been aware of the expiry of the general government guarantee and have moved deposits not covered from small to large institutions or spread their deposits among several institutions.

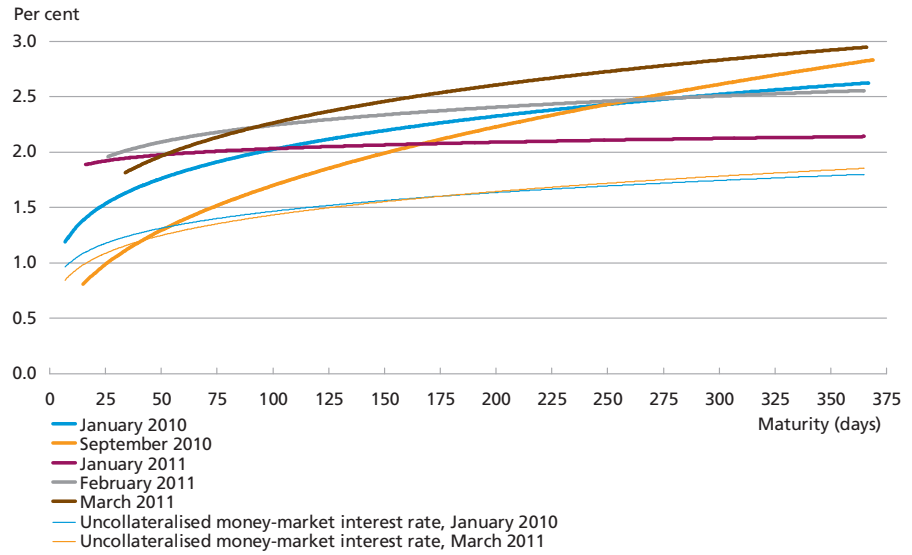
The coverage spread among institutions in groups 2 and 3 remains significant. The observed increase in 2010 related to all institutions, not only those with the lowest coverage at the beginning of the year. In contrast, the spread narrowed substantially for group 1 as a result of an increase in the share of covered deposits in a single institution.

Traditionally, deposits covered by deposit guarantee schemes are assumed to be more stable than deposits not covered. This is reflected in the coming liquidity regulation, according to which one of the requirements is that deposits should be covered by deposit guarantee schemes to be defined as stable, cf. Chapter 6.

Competition to attract deposits has intensified in recent years, especially for the small and medium-sized institutions. This could lead to less stable deposits, irrespective of whether they are covered by deposit guarantee

ESTIMATED YIELD CURVES IN THE TERM DEPOSIT MARKET ON THE BASIS OF MYBANKER, COMPARED WITH UNCOLLATERALISED MONEY-MARKET INTEREST RATE

Chart 24



Note: The yield curves have been estimated on the basis of the preceding 14 days' highest interest rates for amounts exceeding kr. 1 million.

Source: Mybanker and Danmarks Nationalbank.

schemes. This development could especially affect small institutions' funding opportunities and costs.

As an indicator of the competition the interest rates offered in the market for term deposits is used.[1] These rates rose from January 2010 to mid-March 2011, cf. Chart 24. The rise was particularly pronounced in the 1st quarter of 2011. Moreover, in the period up to the expiry of the general government guarantee, there was a tendency for term deposits to be renewed for expiry within the government guarantee, and for small banking institutions to offer high interest rates. Compared with developments in the uncollateralised money-market interest rate, which was practically unchanged during this period, the higher interest rates point to fiercer competition to attract deposits for small banking institutions. Enhanced competition entails a greater risk that the deposits are not redeposited in the same banking institution on expiry. Dependence on this type of deposits may thus increase the institution's liquidity risk.

THE BANKING INSTITUTIONS' EXCESS LIQUIDITY COVER AND STRESS TESTS

Section 152 of the Financial Stability Act contains a minimum requirement for the amount of liquid funds of banking institutions. This is to provide a buffer in case an institution needs to procure liquidity at short notice. The buffer primarily comprises liquid securities, claims on other banking institutions and certificates of deposit, the former making up 82 per cent of the total buffer.

As a minimum, the liquidity buffer must constitute the higher of:

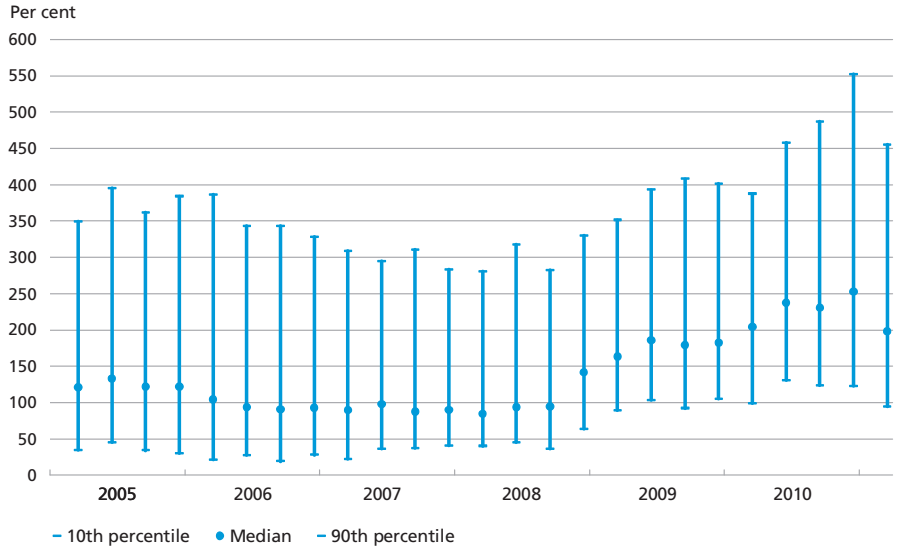
- 15 per cent of the debt exposures that, irrespective of possible payment reservations, shall be payable by the banking institution on demand or are redeemable at less than one month's notice, and
- 10 per cent of the total debt and guarantee exposures of the banking institution, less subordinated debt that may be included in calculations of the base capital.

The buffer requirement has been tightened in the Supervisory Diamond, according to which excess liquidity cover relative to the minimum requirement must be at least 50 per cent, cf. Chapter 1. In principle, the banking institutions should comply with this threshold by the end of 2012.

The excess liquidity cover relative to the minimum requirement has generally been increasing since March 2008, cf. Chart 25. This indicates that

[1] The analysis is based on interest rates offered in the market for term deposits at Mybanker. 29 small and medium-sized banking institutions have signed up to provide offers for term deposits and/or cash annuity and capital pension saving schemes at Mybanker.

THE BANKING INSTITUTIONS' EXCESS LIQUIDITY COVER Chart 25



Note: Based on the Danish Financial Supervisory Authority's key ratio "Cover relative to statutory liquidity requirement", which shows excess liquidity after compliance with the 10-per-cent requirement in section 152 of the Financial Business Act. Liquidity must amount to at least 10 per cent of the total debt and guarantee commitments less subordinated capital investments, which can be included in the calculation of the base capital. The most recent observations are from the 1st quarter of 2011.
Source: Danish Financial Supervisory Authority.

the liquidity position of Danish banking institutions has improved. However, there is considerable variation between the institutions. At end-March, four institutions did not meet the tighter requirements of the Supervisory Diamond. In general, group 1 institutions have lower excess liquidity cover than the other institutions. Large banking institutions have access to more sources of liquidity and other possibilities of managing the buffer cost-effectively than small banking institutions. The lower level of excess liquidity cover should be seen in relation to the impact on financial stability if a large banking institution falls short of liquidity, and it is being considered internationally whether systemically important institutions should be subject to tightened liquidity requirements, cf. Chapter 7.

The decline in the excess liquidity cover of the median institution from December 2010 to March 2011 is primarily attributable to the expiry of Danmarks Nationalbank's temporary facilities on 26 February 2011. Especially the option to obtain credit on the basis of excess capital adequacy contributed to increase the excess liquidity cover up to and including December 2010. Following the expiry of the other temporary facilities on 26 February 2011, it is no longer possible to pledge quoted and unquoted shares, investment fund shares and loan bills as collateral for credit from Danmarks Nationalbank.

LIQUIDITY MODELS AND STRESS ASSUMPTIONS Box 4

For institutions in groups 1 and 2, forecasts of excess liquidity cover are made in a model developed by the Danish Financial Supervisory Authority and Danmarks Nationalbank, while institutions in groups 3 and 4 may opt for a model developed by the Association of Local Banks, Savings Banks and Cooperative Banks in Denmark, (Lokale Pengeinstitutter, LoPi). The main assumptions of the two models are described below.[1]

Stress assumptions in the LoPi model:

- All debt with a maturity of more than 1 month is not extended on expiry, and the institution cannot issue new bonds.
- The 10 largest term deposits are not renewed on expiry.
- 100 per cent of all short-term debt (<1 month) to credit institutions will lapse after the first month.
- Deposits excluding the 10 largest term deposits decrease by 1 per cent per month.
- Lending increases by 1 per cent per month.
- Haircut of 10 per cent for equities and 7.5 per cent for bonds.

Stress assumptions behind the stress test for institutions in groups 1 and 2:

- All capital market funding matures contractually and is assumed not to be renewable upon expiry.
- All debt to credit institutions matures contractually and is not renewable.
- Deposits from retail and corporate customers decline during the first month and are constant over the remaining months.
- If the institution has a credit rating, the calculation includes the consequences of a downgrade by two notches during the first month.
- Extra drawings on committed credit and liquidity facilities granted but not utilised.
- Cash, central bank deposits, certificates of deposit, Danish government and mortgage bonds are liquidated at 100 per cent of their market value.
- Unencumbered liquid assets in the form of European government bonds and European covered bonds are liquidated with a haircut of 7.5 per cent, other liquid assets are recognised with a haircut of 10 per cent.
- 0 per cent lending growth to retail and corporate customers, excluding credit institutions.

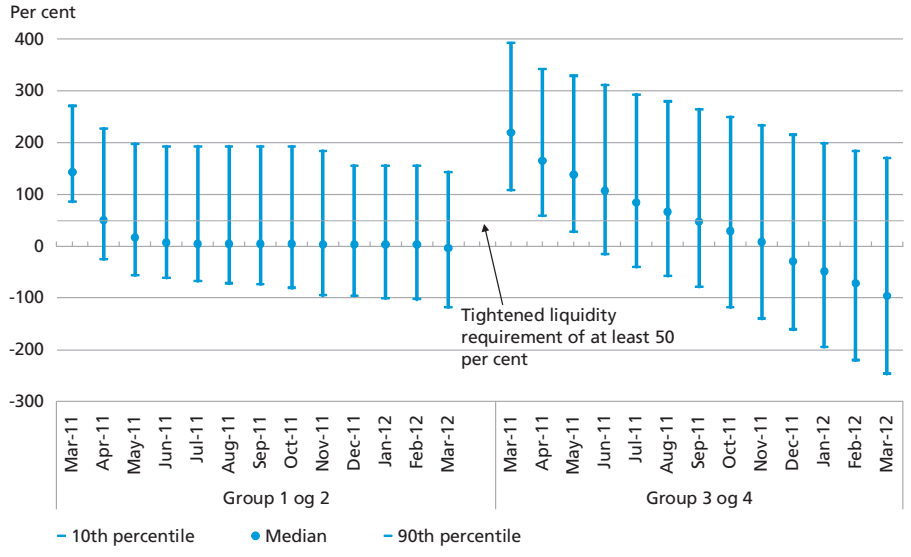
[1] For a more detailed description of all the stress assumptions in the models, see Box 6 in *Stress Tests*, 2nd Half 2010. For a description of the Danish Financial Supervisory Authority's and Danmarks Nationalbank's oversight of the liquidity of Danish banking institutions, see Box 5 in *Financial Stability*, 2010.

Stress test of the banking institutions' liquidity

Since January 2010, the Danish Financial Supervisory Authority and Danmarks Nationalbank have received monthly liquidity forecasts from Danish banking institutions in a baseline and a stress scenario, cf. Box 4. The projections give an estimate of whether the institutions will be able to comply with the statutory minimum requirement in the coming 12 months.[1] Furthermore, they provide insight into the banking institutions' liquidity

[1] However, they do not show whether the institution will have positive liquidity in absolute terms on each banking day. Hence a section 152 forecast must therefore be combined with forecasts of the institutions' other significant cash flows to avoid sudden shortages of liquidity.

EXCESS LIQUIDITY COVER IN STRESS TESTS FOR GROUPS 1-2 AND 3-4 Chart 26



Note: Based on forecasts for March 2011 by 16 institutions in groups 1 and 2 in the stress test using the model by Danish Financial Supervisory Authority and Danmarks Nationalbank and forecasts for 48 institutions in group 3 and 10 in group 4 based on stress tests using the LoPi-model.
Source: Danish Financial Supervisory Authority and Danmarks Nationalbank.

position and for the individual institution may pinpoint liquidity risks that it should give special attention in the coming 12 months. The stress tests do not yet cover the periods in 2012 and 2013 when most of the debt issuances with individual government guarantees mature.

The most recent forecasts show that most of the Danish banking institutions have sufficient liquidity to withstand several months of liquidity stress, cf. Chart 26. In general, the forecasts have shown a positive trend since the oversight began. But they also show a wide spread among the institutions, both at the point of departure and over the 12 months covered by the stress test. A few institutions will have insufficient room to manoeuvre in the event of liquidity stress as defined in the stress test.

The decline in the excess liquidity cover in groups 1 and 2 is particularly strong in the first month of the stress scenario. This reflects the underlying assumptions of the forecast, with relatively severe stress the first month. It also illustrates the institutions' dependence on short-term market-based funding. In the LoPi model, the stress is distributed more evenly across the period, which is also reflected in the development in excess liquidity cover. The median institution in groups 1 and 2 will not have negative excess liquidity cover during the 12-month stress scenario. After the first month, it fails by a narrow margin to meet the tighter requirement of 50 per cent excess liquidity cover. In groups 3 and 4, the median institution has nega-

tive excess liquidity cover in month 9 of the stress scenario, while the tightened requirement of at least 50 per cent is not met from month 6.

There is no statutory requirement saying how long a banking institution should be able to withstand liquidity stress. The European Banking Authority, EBA, recommends that the liquidity buffer must be sufficient for the institution to resist a period of intensive liquidity stress lasting up to one month. In its proposal of the Liquidity Coverage Ratio, the Basel Committee suggests that banking institutions should hold high-quality liquid assets that are sufficient to offset the net cash outflows during a 30-day liquidity stress scenario, cf. Chapter 6.

THE MORTGAGE-CREDIT INSTITUTES' FUNDING CONDITIONS

In their capacity as intermediaries between investors and borrowers, mortgage-credit institutes are dependent on being able to issue bonds. This requires both the existence of a well-functioning market and confidence in the individual mortgage-credit institute and the mortgage-credit system as such. The need for access to the financial markets on an ongoing basis has increased substantially in recent years, reflecting both the wider use of adjustable-rate mortgages and a large increase in the outstanding volume of covered bonds, SDOs, and covered mortgage bonds, SDROs.[1]

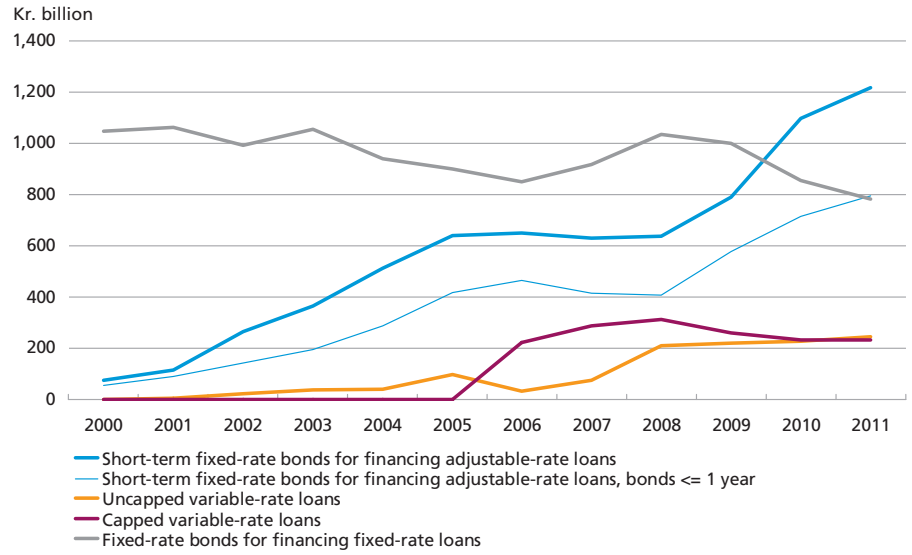
Refinancing risk on adjustable-rate mortgages

Bonds issued in connection with adjustable-rate mortgages mature before the loans expire. The outstanding volume of bonds for financing adjustable-rate mortgages increased from kr. 636 billion to kr. 1,217 billion from 2008 to 2011, cf. Chart 27. Bonds with a remaining term to maturity of less than 1 year accounted for kr. 795 billion at end-February 2011, most of which had to be refinanced within 1 year.

If uncertainty arises as to the financial strength of a mortgage-credit institute and hence its ability to maintain the credit rating of the bonds or their status as SDOs, investors will require a risk premium by way of a higher interest rate. A high risk premium may also reflect generally higher uncertainty among investors. The risk incurred by borrowers taking out adjustable-rate mortgages is linked not only to the general development in interest rates, but also to the ability of the mortgage-credit institutes to issue bonds at any given time. Borrowers are therefore dependent on both market-related and institution-specific conditions during the entire

[1] In the following, the term SDOs is used for both of these bond types. Moreover, the term mortgage bond designates both traditional mortgage bonds and SDOs and SDROs issued by mortgage-credit institutes, unless otherwise indicated.

OUTSTANDING MORTGAGE BONDS BY LOAN TYPE Chart 27



Note: Nominal outstanding volume at end-February. Before 2006, capped variable-rate bonds are included under variable-rate bonds.
Source: Danmarks Nationalbank.

life of the loan. The risk assumed by the borrowers also implies a credit risk for the mortgage-credit institute if the borrowers are not able to meet their obligations. The refinancing risk thus affects the individual borrower, but as many borrowers are exposed to the same type of risk, it also implies risks for the mortgage-credit institutes and the economy as a whole.

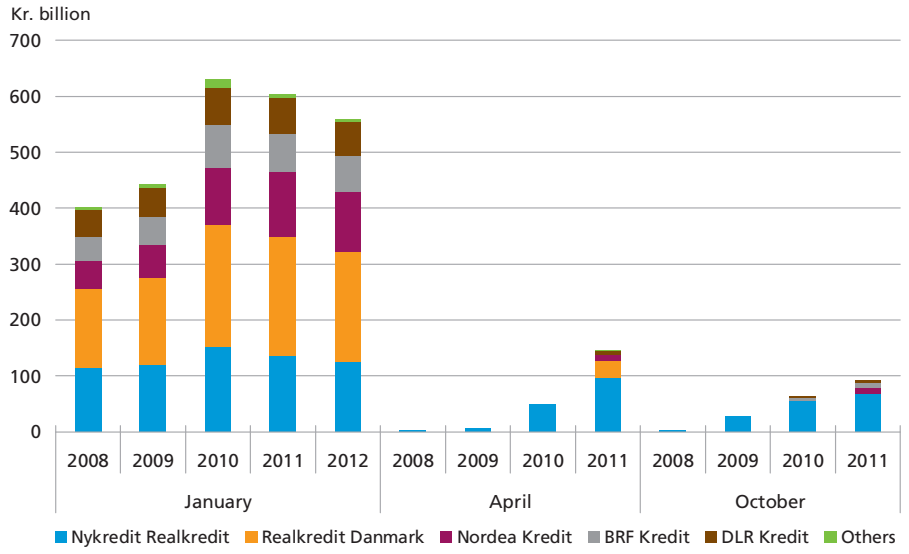
The risk assumed by mortgage-credit institutes is that they may need to refinance their bond issues at a time when it is not possible. The financial crisis has shown that markets which normally function well may quickly cease to function. If a situation arises where it is not possible to issue in certain markets, it will have serious consequences for the financial stability.

Spreading the refinancing need

The bonds underlying the adjustable-rate mortgages have largely been refinanced at auctions in December. Spreading the auctions reduces the risk that turmoil in the financial markets will affect all borrowers at the same time. This can be achieved by financing new loans with bonds maturing e.g. in April or October rather than December, and by changing the refinancing dates for existing loans.

The refinancing still takes place mainly in December. Nykredit Realkredit has spread its auctions over the year, while the remaining institutes have

MATURING BONDS FOR FINANCING ADJUSTABLE-RATE LOANS BY MONTH AND INSTITUTION — Chart 28

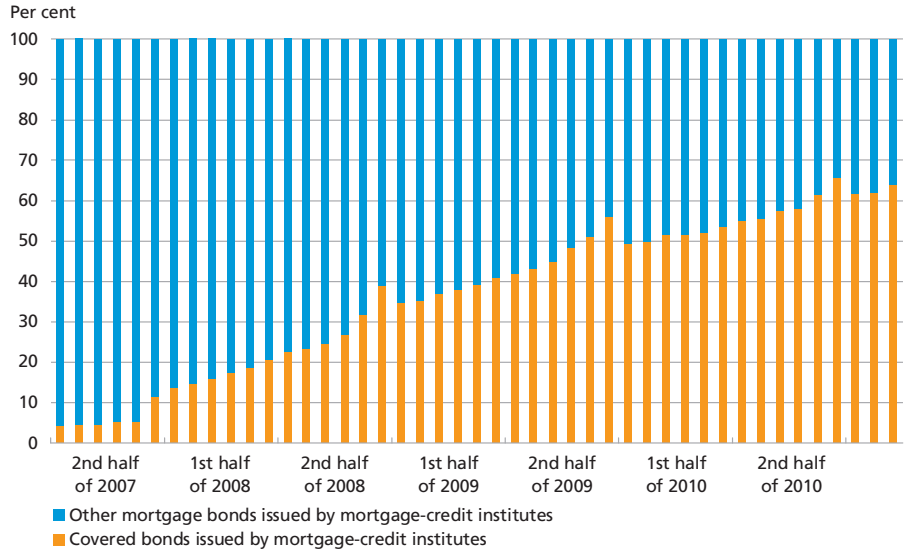


Note: Maturing bonds on the basis of the nominal outstanding volume at the end of the preceding month. Bonds maturing in October 2011 and January 2012 are, however, based on the outstanding volume at end-March 2011. Owing to factors such as principal payments and prepayment the full amount will not be refinanced.
Source: Danmarks Nationalbank.

done so only to a limited extent. Of the total expected volume of approximately kr. 840 billion maturing in 2011, more than kr. 600 billion matured in January, cf. Chart 28. At the same time, the total outstanding volume of bonds for financing adjustable-rate mortgages has increased in recent years, so although some smoothing has taken place over the year, the volume maturing in January has risen from approximately kr. 400 billion in 2008 to more than kr. 600 billion in 2011. As a result of discussions between Danmarks Nationalbank, the Association of Danish Mortgage Banks and the Danish Mortgage Banks' Federation in 2009, the vast majority of new adjustable-rate mortgage loans in Danish kroner taken out after 2010 will mature in either April or October.

Since mortgage agreements usually run for up to 30 years, and growth in adjustable-rate mortgages was substantial in 2009 and 2010, it may be necessary to change existing agreements in order to achieve a satisfactory distribution. However, premature redemptions of loans, e.g. in connection with mortgage refinancing or extension of deferred amortisation beyond the term of the original loan agreement may contribute to better diversification when the borrower enters into a new loan agreement. An appropriate distribution of the loans is in the interests of both society and the mortgage-credit institutions. As the borrowers will have to pay registration fees etc. in connection with rescheduling the time of refinancing, the

OUTSTANDING MORTGAGE BONDS BY BOND TYPE Chart 29



Note: Nominal value, end of month.
Source: Danmarks Nationalbank.

incentive to reschedule it is limited as these fees should be weighed against a more abstract refinancing risk – with serious potential consequences.

The Basel Committee's proposal for new liquidity requirements is also aimed at the refinancing risk linked to financing long-term loans via short-term bonds. The future requirements will have a major impact on the mortgage-credit sector, cf. Chapter 6.

The Association of Danish Mortgage Banks and the Danish Mortgage Banks' Federation have invited Danmarks Nationalbank to participate in work aimed at reducing the refinancing risk. Danmarks Nationalbank emphasises that the solutions found should be robust.

Prevalence of SDOs and statutory requirement for top-up collateral

Since the SDO legislation entered into force on 1 July 2007, the proportion of SDOs has increased, unlike mortgage bonds without SDO status, cf. Chart 29. The mortgage-credit institutes now primarily issue SDOs, partly because the capital charge for credit institutions from acquiring SDOs is lower than for bonds without SDO status[1], partly because investors see

[1] The risk weights applied to the assets of credit institutions are laid down in the Capital Requirements Directive (2006/48/EC) on the basis of an overall assessment of the risk linked to the value of an asset. The risk weight has a bearing on the capital that a credit institution must hold and thus on the

TOP-UP COLLATERAL AND ISSUANCE OF JUNIOR COVERED BONDS Box 5

Lending by mortgage-credit institutes and the underlying collateral, typically in property, is linked to the SDOs issued and any JCB in capital centres, which are separate units under the mortgage-credit institutes. In the event of default, the claims and obligations linked to a capital centre are treated in such a way that neither other capital centres nor the other creditors of the mortgage-credit institutes have access to funds in the capital centre before all the capital centre's own claims have been met. When a capital centre issues both SDOs and JCB, the proceeds are transferred to the capital centre, but claims from investors in JCB rank after claims from investors in SDOs. This construction entails that investors in JCB incur greater risk than investors in SDOs issued by the same capital centre.

The calculation of top-up collateral in a capital centre may include e.g. the capital base, proceeds from issued JCB and guarantees issued by credit institutions, provided that a number of requirements are met. Generally, the securities included as top-up collateral must be sufficiently secure, and securities and guarantees issued by credit institutions may not exceed 15 per cent of the nominal volume of outstanding SDOs.

these bonds as particularly secure, resulting in lower interest costs. Consequently, this trend can be expected to continue.

The legislation on SDOs entails that the value of an individual loan must never exceed a fixed percentage of the collateral pledged by the borrower, unless the mortgage-credit institute has pledged other collateral for the loans. If the market value of a house falls, the mortgage-credit institute may have to pledge top-up collateral. If the requirement for underlying collateral is not met, all bonds issued by the capital centre in question lose their SDO status. Furthermore, the Danish Financial Supervisory Authority may withdraw the mortgage-credit institute's SDO status, thereby preventing it from issuing SDOs. The alternative is to issue mortgage bonds without SDO status, which are less secure in such a situation and hence more difficult to sell.

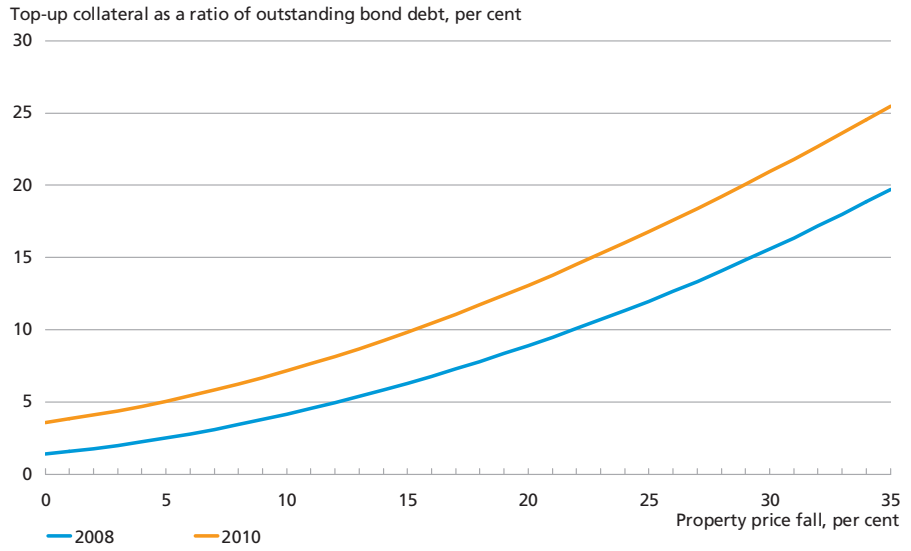
Most mortgage-credit institutes can pledge top-up collateral in case of a minor decline in house prices. But in connection with a large decline they may have to raise funds by issuing junior covered bonds, JCB. Investors in JCB incur greater risk than investors in SDOs, cf. Box 5. Should a fall in house prices coincide with financial turmoil, it may be difficult or, at worst, impossible to sell JCB. Consequently, a strong fall in house prices poses a serious challenge to the mortgage-credit sector.

A large potential need for top-up collateral

On the basis of information about a number of mortgage loans and the market value of the properties pledged as collateral for these loans at

"cost" linked to holding an asset. The risk weight for newly issued Danish mortgage bonds without SDO status is 20 per cent, while it is 10 per cent for SDOs.

NEED FOR TOP-UP COLLATERAL ON GENERAL FALL IN HOUSE PRICES Chart 30



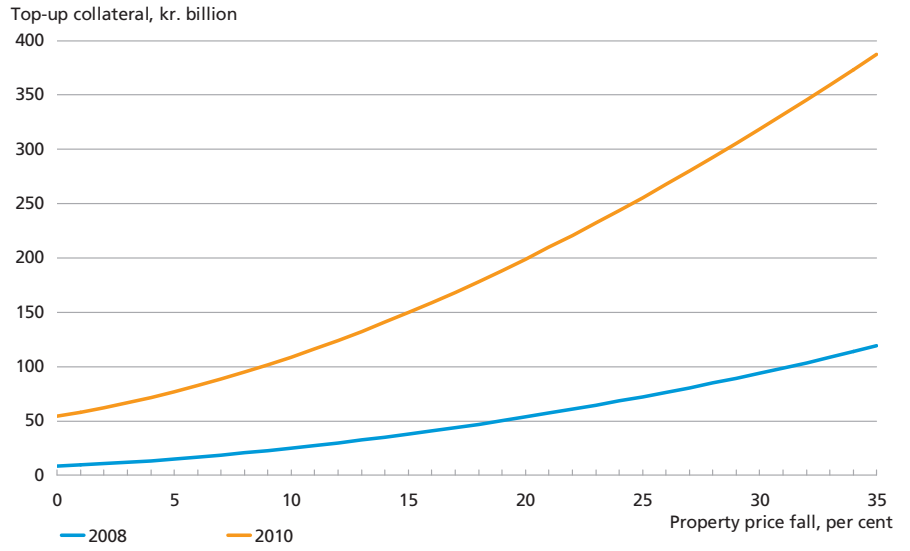
Note: In the calculations for 2008, the outstanding bond debt and property values used have been estimated as of 28 November 2008 and 30 November 2008, respectively. In the calculations for 2010, both have been estimated as of 31 December 2010. The need for top-up collateral to some extent depends on the distribution of price falls on property types. Here it is assumed that all properties fall by the same percentage. This does not materially change the overall result. The calculations have been based on data for owner-occupied housing and summer cottages.
Source: Own calculations.

end-2010, cf. Box 8 in Chapter 3, the potential need for top-up collateral on a general property price fall is estimated. The need for top-up collateral increases more than proportionally to the size of a property price fall. Firstly, the need for top-up collateral will increase for loans that already require top-up collateral. Secondly, more loans will require top-up collateral, because the collateral requirement is exceeded.

Since 2008, the number of loans requiring top-up collateral has increased, and the average loan is closer to require top-up collateral. The main reason is that house prices fell from 2008 to 2010. The need for top-up collateral if property prices fall by 10 per cent currently corresponds to 7 per cent of the outstanding bond debt, compared with 4 per cent in 2008, cf. Chart 30. As the nominal outstanding volume of SDOs has risen from approximately kr. 600 billion to approximately kr. 1,500 billion in the same period, the need for top-up collateral, measured in kroner, has also increased substantially, cf. Chart 31. The aggregate need for top-up collateral if house prices fall by 10 per cent after 2010 can be estimated at more than kr. 100 billion, while the aggregate need would have been approximately kr. 25 billion in 2008.

A mortgage-credit institute can pledge further top-up collateral in a capital centre in order to achieve or retain a given credit rating. If a

NEED FOR TOP-UP COLLATERAL ON GENERAL FALL IN PROPERTY PRICES Chart 31



Note: The nominal volume of outstanding SDOs applied in the statement is from end-October 2008 and end-January 2011 to avoid that outstanding bonds as well as newly issued bonds are included in the statistics. It is assumed that the estimated need for top-up collateral, expressed as a percentage of the outstanding bond debt at fair value, is representative for the total volume of outstanding SDOs. Since the outstanding SDOs relate to loans for other purposes than those comprised by the original data set, and the distribution of price falls on property types may not be even, the data should be interpreted with some caution.

Source: Own calculations.

credit rating agency requires a certain volume of excess collateral relative to the statutory requirement, it may be just as important for the mortgage-credit institute to observe this limit as the statutory limit for SDOs. The reason is that changes in credit ratings can make it more difficult to issue bonds.

The credit rating of a mortgage bond depends partly on the credit rating of the issuer and partly on the quality and value of the collateral in the capital centre. For instance, a decline in house prices may result in the credit rating agency re-examining the quality of the collateral and increasing their requirement for excess collateral relative to the legal requirement. The need for further collateral to retain a credit rating can therefore rise faster and more than the legal requirement for maintaining the SDO status.

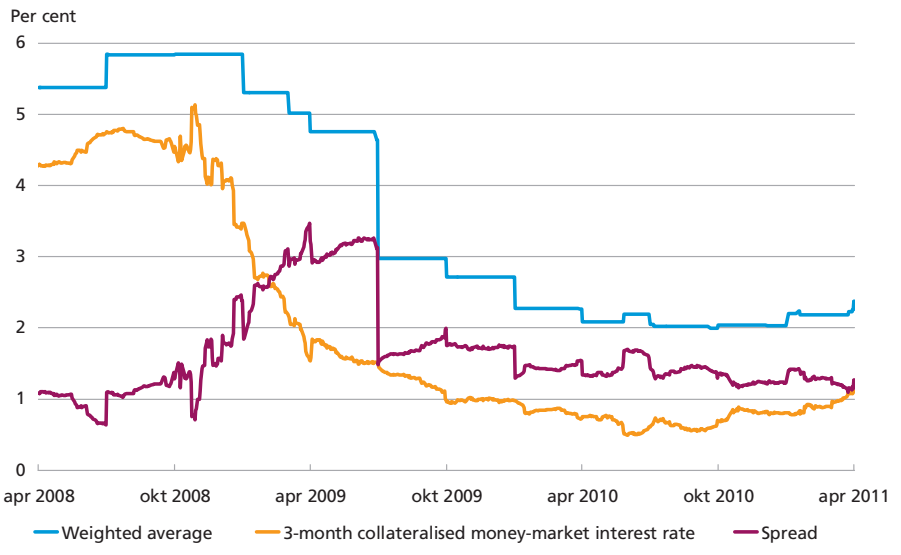
Issuance of junior covered bonds

Issuance of JCB has totalled approximately kr. 50 billion since the legislation on SDOs entered into force. Approximately kr. 20 billion has expired, leaving an outstanding volume of approximately kr. 30 billion. So far JCB issuance has been concentrated on BRF Kredit and Nykredit Realkredit, possibly because other large mortgage-credit institutes have the

option to pledge guarantees issued by their parent companies as top-up collateral. The bonds issued had an initial remaining term to maturity of between 1 and 6 years. A large proportion of the bonds issued are variable-rate bonds based on 3- or 6-month unsecured interest rate. The current costs of raising top-up collateral via JCB depends on the difference between the yield on the JCB sold and the interest rate on the sufficiently secure instruments bought and placed in the capital centre.

The average cost linked to the JCB issued, measured as the difference between the actual yield on the JCB issued and the collateralised 3-month interest rate, has varied considerably over time, cf. Chart 32. Before the crisis it was close to 1 percentage point, rising to more than 3 percentage points during the crisis. Recently, it has been just under 1.5 percentage points. The difference depends on the spread between collateralised and uncollateralised interest rates, as well as the premium on JCB relative to uncollateralised interest rates. During 2008, the spread between the collateralised and uncollateralised money-market interest rate widened from approximately 0.5 percentage point to more than 1.5 percentage points. Moreover, investors required a higher premium relative to the uncollateralised reference rate for bonds that were issued subsequently. Hence, experience shows that the costs increase considerably in connection with

LEVEL OF INTEREST RATES FOR ISSUED JUNIOR COVERED BONDS — Chart 32



Note: The weighted average has been calculated on the basis of the variable interest rate and the highest nominal outstanding volume of the individual variable-rate bonds denominated in Danish kroner. The maturities of the issued bonds vary, which has an impact on the rate of interest required by investors. In addition, the calculation is to some extent influenced by whether short-term interest rates develop as expected. The collateralised money-market interest rate is used as indicator for interest rate on a safe investment. This rate is of the same magnitude as a maturity-adjusted yield on short-term Danish government bonds, which can be pledged as top-up collateral.

Source: Danmarks Nationalbank, Nykredit, BRF Kredit.

turmoil in the financial markets, as seen towards the end of 2008 and in the first part of 2009.

The mortgage-credit institutes can to some extent bear the normal costs of issuing JCB, and the most significant risk is therefore that large house price falls and a need for top-up collateral coincide with a crisis in the financial markets. This would make it particularly expensive, or maybe even impossible, to pledge top-up collateral when it is required. Consequently, the risk of a large increase in the need for top-up collateral at a time when it cannot be raised should be reduced.

The need to pledge top-up collateral if house prices fall can be reduced by establishing a buffer before the need arises. This can be done e.g. by selling JCB for financing top-up collateral in advance, by reducing the loan-to-value ratio or by restricting access to deferred amortisation. The latter will reduce the potential need for top-up collateral in tandem with the principal payments. At the same time, this will contribute to reducing fluctuations in house prices.[1]

The government has set up a working group to look into the impact of the collateral requirement and how this affects financial stability in Denmark.

[1] This effect is described in more detail in Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2011.

3. The Corporate Sector and the Households

Against the backdrop of an improved cyclical situation over the past year, the corporate failure rate can be expected to be slightly lower in 2011 relative to 2010. Accordingly, the banking institutions' loan impairment charges are expected to be reduced in 2011. In a longer perspective, the number of compulsory liquidations remains substantial, and the need for loan impairment charges among the banking institutions is expected to remain high.

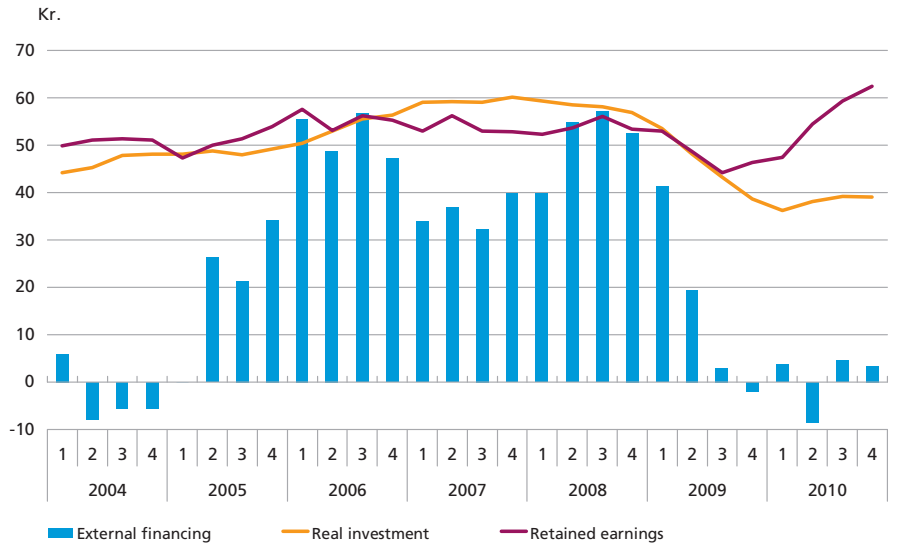
The households' debt accounted for approximately 3 times the annual disposable income at end-2010, which is substantially more than in the other Nordic countries. Households still have considerable net wealth, but only a small proportion is liquid, and the distribution of net wealth is uneven. The combination of high debt and many illiquid assets has increased the exposure of Danish households to e.g. changes in interest rates and temporary loss of income.

Variable-rate loans, many of them with deferred amortisation, now account for most of the debt. The low interest rates in recent years have made it easier for households to service their debt. At the same time, the higher exposure to interest rates means that higher interest rate will have a more severe impact on household finances. However, the financing pattern shows that for loans raised since 2004 the loan amount is, on average, higher for variable-rate and deferred-amortisation loans than for fixed-rate loans with amortisation. This pattern would indicate that the households with the most risky loans have not ensured that they are sufficiently robust. The current range of financing options and the advice offered encourages households to hold smaller financial buffers related to real property than traditional loan types. High exposure among many households may have a negative impact on financial stability. In the coming years, the households should ensure that their finances are sufficiently robust. Lenders should perform realistic "stress tests" of the households' ability to service their debt under different conditions when offering advice and considering loan applications.

THE CORPORATE SECTOR

Corporate lending accounts for approximately 37 per cent of the banking institutions' total loans and about 23 per cent of the mortgage-credit in-

REAL INVESTMENT, RETAINED EARNINGS AND EXTERNAL FINANCING (GROWTH) FOR DANISH COMPANIES Chart 33



Note: The figures of the Chart have been calculated as four-quarter moving averages. External financing is stated net and comprises net borrowing from banks and mortgage credit institutions, net issuance of bonds and net issuance of shares, etc. Retained earnings are the profit for the period that is not distributed to the owners. Retained earnings and investment are stated gross, i.e. before deduction of depreciation.
Source: Danmarks Nationalbank and Statistics Denmark.

stitutes' total loans.[1] The finances and resilience of the corporate sector are key factors in the credit institutions' earnings and losses – and thus in financial stability.

Corporate sector financing

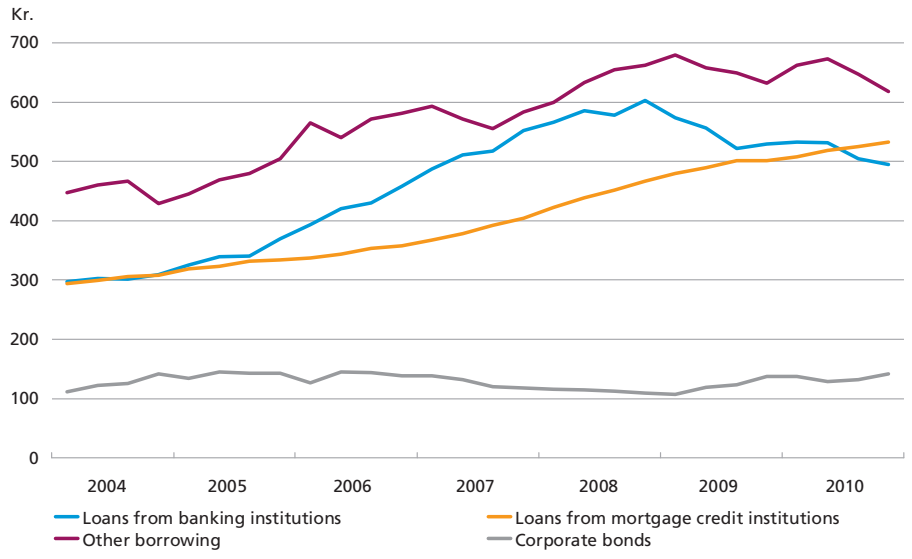
The Danish economy is slowly recovering from the crisis. In 2010, corporate investment activity showed a slight upward trend, but remains below the level observed before the latest economic upswing, cf. Chart 33.

Corporate retained earnings increased in 2010 to a level that, for the corporate sector as a whole, far exceeded real investment. Companies placed the share of retained earnings that was not invested in capital equipment and stocks in intra-group loans and bonds, among other things, while bank deposits were reduced. The high level of retained earnings shows that the corporate sector has succeeded in adapting costs to current market conditions.

Over the last 18 months, the corporate sector's aggregate external funding has been more or less unchanged. The funding structure has changed a little in that the sector overall has reduced its debt to credit

[1] The total loans of both banking institutions and mortgage credit institutions are exclusive of loans to other credit institutions.

CORPORATE DEBT AND BONDS ISSUED Chart 34



Note: Other borrowing comprises corporate borrowing abroad (including intra-group loans), borrowing from public authorities, other financial intermediaries, etc.
Source: Danmarks Nationalbank.

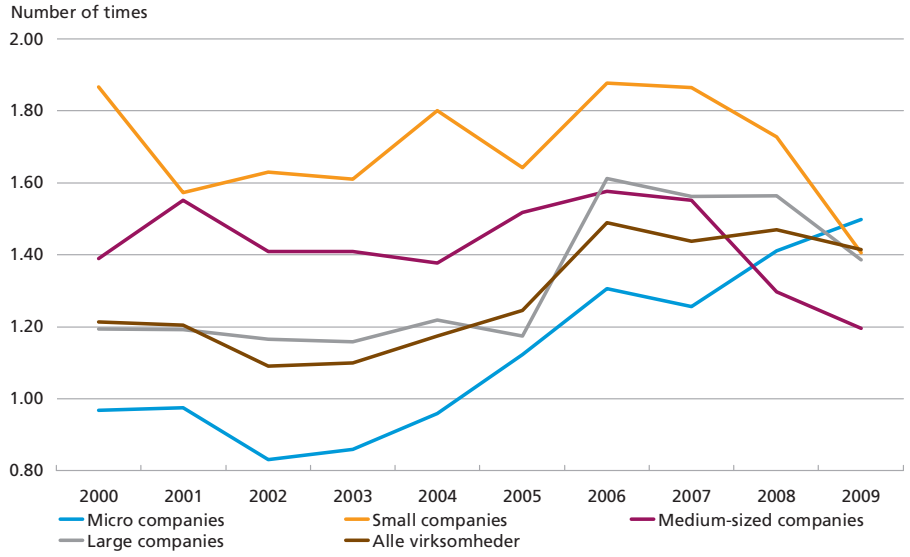
institutions and issued corporate bonds and shares instead. Nevertheless, the volume of corporate bonds remains low, cf. Chart 34 reflecting factors such as the business structure in Denmark with few large and many small companies. In addition, there has been a shift towards more long-term loans from mortgage-credit institutes and less funding by banking institutions.

Corporate borrowing has ground to a halt in recent years, which should be viewed in the light of the pre-crisis trend of borrowing, among other factors. Before the financial crisis, there was an increase in corporate leverage, in terms of the debt-to-equity ratio, cf. Chart 35. At the start of the most recent economic upswing, the rise in the corporate sector's average leverage was driven extensively by developments in very small firms with less than 10 employees (micro companies). The leverage of other companies did not begin to rise until later in the cycle. Subsequently, the leverage ratio has fallen, but not for micro companies.[1] A lower leverage ratio will make companies more robust.

Corporate interest-rate exposure depends on the companies' leverage, the use of variable-rate debt and the maturity of the debt. Moreover, strong reliance on borrowing from banking institutions will expose them to changes e.g. in lending policy. From this point of view, it could be an

[1] Data covers the period until and including 2009.

CORPORATE LEVERAGE Chart 35



Note: As a point of departure, companies are broken down by size based on the number of full-time employees. If the company has not stated its number of employees, the breakdown is based on its balance-.sheet total. Micro companies have less than 10 employees (alternatively balance-sheet total ≤ 2 million euro), small companies have 10-49 employees (alternatively balance-sheet total > 2 million euro and ≤ 10 million euro), medium-sized companies have 50-249 employees (alternatively balance-sheet total > 10 million euro and ≤ 43 million euro) and large companies have 250 employees or more (alternatively balance-sheet total > 43 million euro). Leverage is calculated as the sum of short-term and long-term debt as a ratio of equity.

Source: Experian A/S and own calculations.

advantage for individual companies to reduce their dependence on banking institutions.

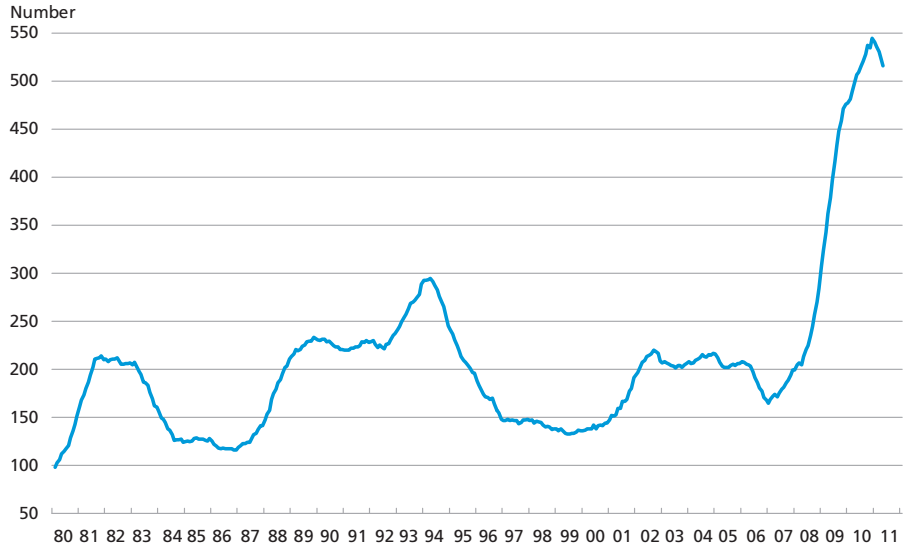
The Minister for Economic and Business Affairs will appoint a committee to look into the opportunities for, in particular, small and medium-sized companies to use corporate bonds as a source of financing. Danmarks Nationalbank will participate in these efforts.

Compulsory liquidations

The number of compulsory liquidations is high, cf. Chart 36. The level is higher than after the banking crisis of the early 1990s. Denmark has more VAT registered companies now than 20-30 years ago, but even allowing for this factor, the number of compulsory liquidations remains high, evidencing the overheating of the economy in the run-up to the crisis when companies increased their business volume and leverage and many new companies were established.

The reduction in the number of compulsory liquidations has been most pronounced in the building and construction sector and in trade, while compulsory liquidations in the property sector continue to show a slight

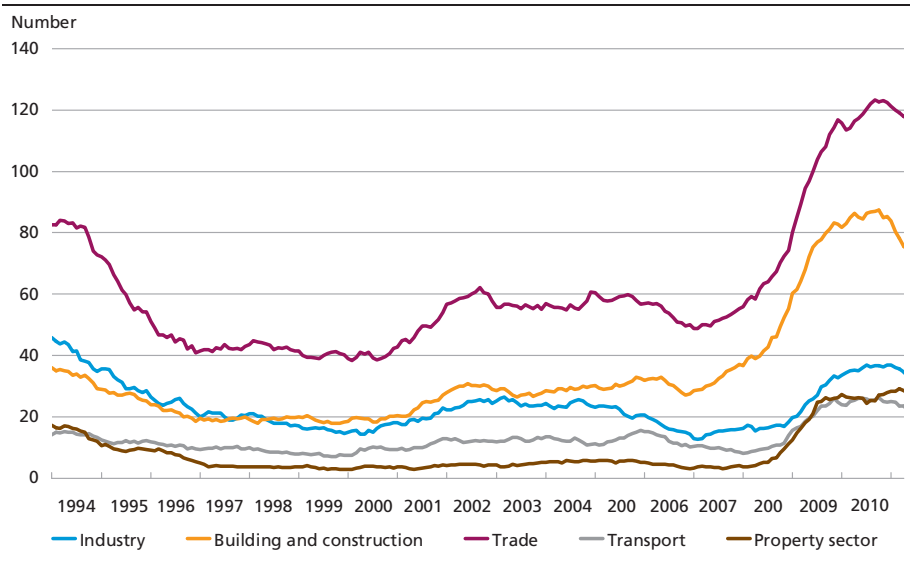
CORPORATE COMPULSORY LIQUIDATIONS Chart 36



Note: Monthly data for number of compulsory liquidations calculated as a 12-month moving average.
Source: Statistics Denmark.

rising trend, cf. Chart 37. This sector, like the building and construction sector, has been severely affected by the financial crisis, resulting in heavy losses in a number of banking institutions, cf. Box 6.

COMPULSORY LIQUIDATIONS BROKEN DOWN BY SECTOR Chart 37



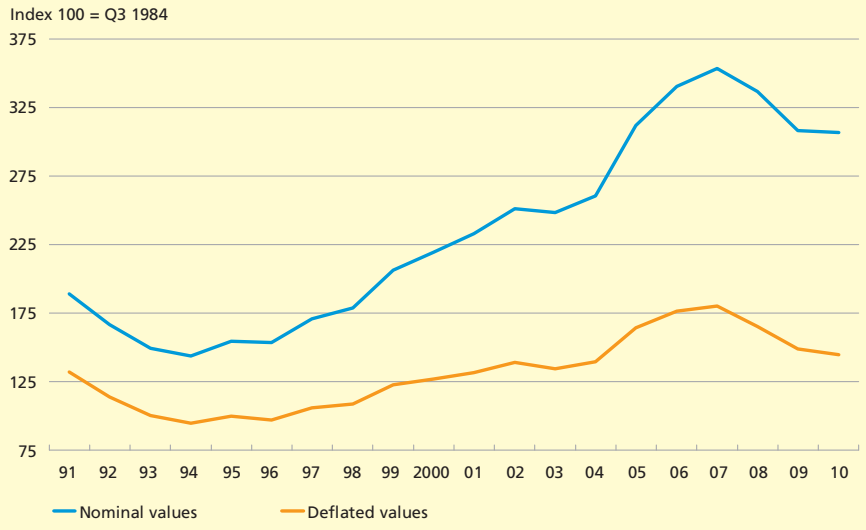
Note: Monthly data for the number of compulsory liquidations calculated as a 12-month moving average. Industry comprises industry, raw materials extraction and utilities. Trade comprises trade, hotels and restaurants. The property sector comprises property trading and rental.
Source: Statistics Denmark.

COMMERCIAL PROPERTIES – TO BE CONTINUED Box 6

The exposure of the banking institutions to the property sector played a key role during the financial crisis. Failing banks acquired by the Financial Stability Company have posted very large loan impairment charges related to property financing. For several of these banking institutions, their exposure to "property management and trade, business service" accounted for up to half of total loans and guarantees. This is due to surging growth in loans for property financing in the years leading up to the crisis. During the period from 2005 to 2008, Roskilde Bank e.g. recorded average annual growth in lending to this industry group of 39.9 per cent. The corresponding figure for Amagerbanken is 48.8 per cent.

From 2004 to 2007, commercial property prices escalated rapidly, cf. Chart A. Prices have subsequently fallen back, but remain above the 2004 level. Secondary location properties have experienced the largest price drops. The falling prices may be attributed to rising unemployment rates and lower rental income as well as higher required rates of return.

PRICE DEVELOPMENTS FOR COMMERCIAL PROPERTIES IN GREATER COPENHAGEN Chart A



Note: The Sadolin & Albæk price index is based on Sadolin & Albæk's sales and valuations of commercial and investment properties in Greater Copenhagen. Adjustment is made for differences in the characteristics of properties, including location, use, maintenance, applicability and economies of scale.
Source: Sadolin & Albæk.

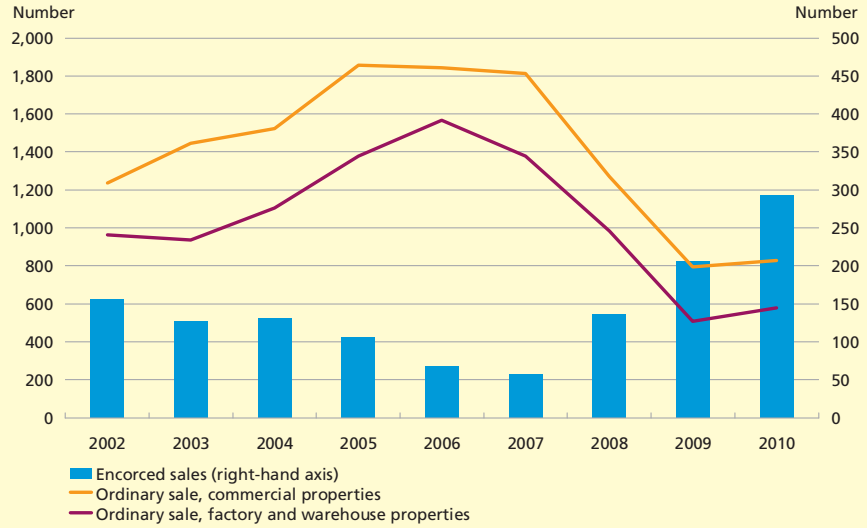
Continued high estimated failure rates

Danmarks Nationalbank's failure-rate model has been used to estimate the probability of a company failing. The calculations show that the estimated failure rate has been around 50 per cent higher in the last couple of years than in the 10-year period before the crisis. Based on calculations, it is expected that estimated failure rates will be a little lower in 2011 than

COMMERCIAL PROPERTIES – CONTINUED Box 6

The number of commercial property transactions plunged in 2008 and 2009. In 2010, transactions increased slightly relative to 2009, cf. Chart B. Due to the limited number of transactions, the valuation of commercial properties is subject to considerable uncertainty. The number of enforced sales of commercial properties has increased since 2007, in 2010 reaching its highest level since 1995. The rise in enforced sales reflects that banking institutions and mortgage credit institutions realise their collateral in distressed properties. Due to low turnover in the market, it may be difficult to achieve a satisfactory price on sale to a third party. Accordingly, the banking institution or mortgage credit institutions may opt to acquire the property. This is reflected in the financial statements of the institutions in the item "assets in temporary possession". Several institutions have set up special property companies to manage the acquired properties for a shorter or longer period of time.

COMMERCIAL PROPERTY SALES ON THE OPEN MARKET AND ENFORCED SALES Chart B

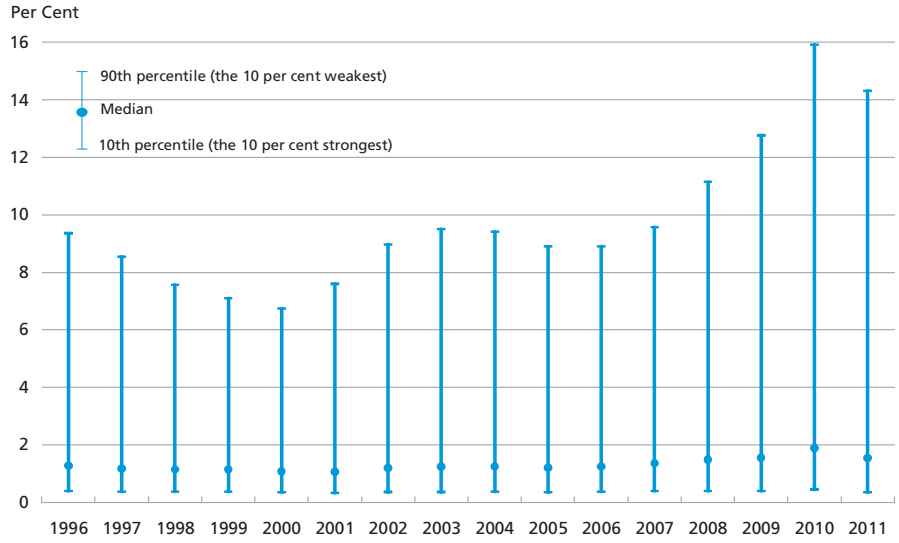


Source: Statistics Denmark.

in 2010, cf. Chart 38.[1] This applies both to median companies and to the weakest companies, constituting the 90th percentile. The drop is attributable mainly to improved economic conditions.

[1] The model has been modified from earlier versions. Rather than the output gap, GDP growth has been used to estimate the failure rates of companies. The sign of the coefficient of GDP growth is negative, entailing that higher growth leads to lower estimated failure rates. For a more detailed description of the model, see Danmarks Nationalbank, *Financial stability*, 2007.

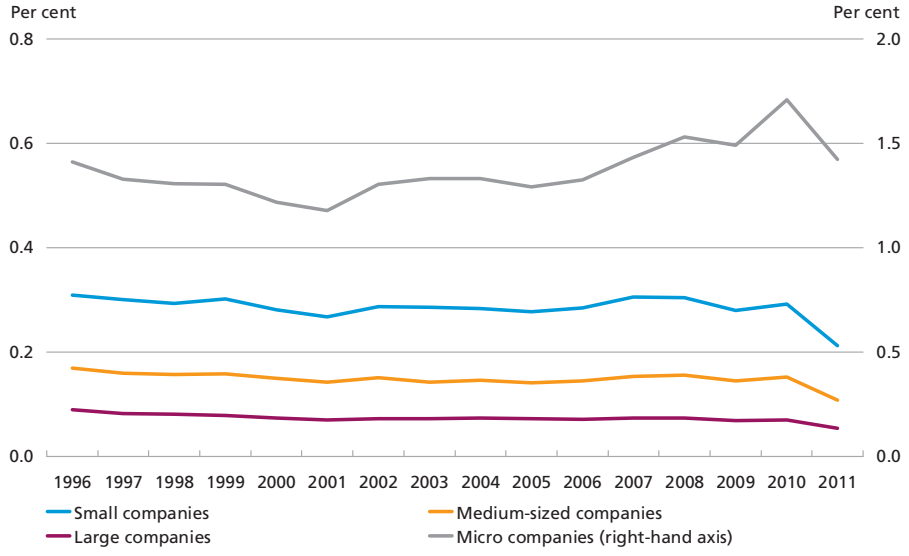
ESTIMATED FAILURE RATES FOR COMPANIES Chart 38



Note: 2011 is a preliminary estimate based on a limited proportion of the financial statements for 2010.
Source: Experian A/S, Statistics Denmark and own calculations.

Estimated failure rates have fallen for all sectors and for companies of all sizes, cf. Chart 39. Estimated failure rates for smaller companies are higher than for larger companies. Companies with less than 10 employees have significantly higher estimated failure rates.

ESTIMATED FAILURE RATES BROKEN DOWN BY COMPANY SIZE Chart 39



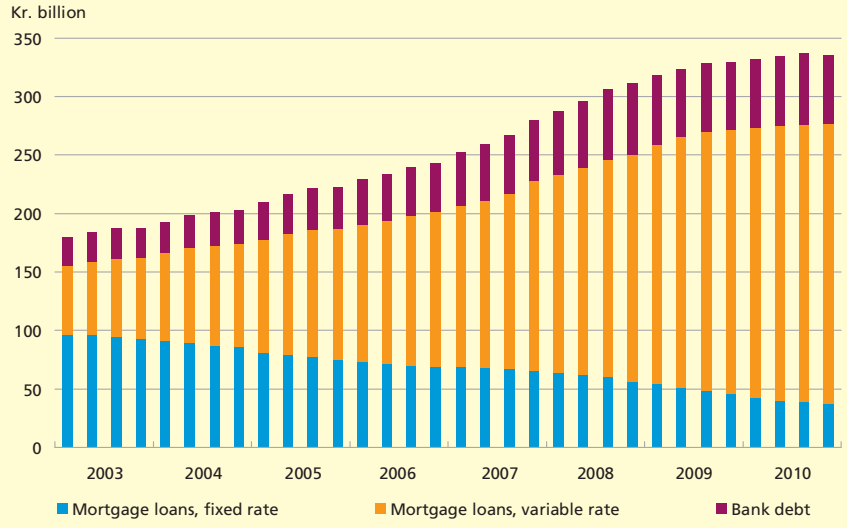
Note: Criteria for the breakdown of companies into the four groups are set out in the note to Chart 35.
Source: Experian A/S, Statistics Denmark and own calculations.

AGRICULTURAL SECTOR — Box 7

The agricultural sector has been in dire financial straits in recent years and the sector is still facing major challenges. 2010 saw a rise in grain, milk and pork prices, leading to a general improvement in the terms of trade. The improvement has, however, not been equal for all types of farming. Higher grain prices laid the foundation for an earnings increase for arable farmers, but, at the same time, the 2010 harvest was much poorer than the harvest in 2009. On average, the settlement price of milk was 12 per cent higher than in 2009. This, in combination with higher settlement prices of slaughter cattle and a drop in the price of cattle feed, led to a marked increase in cattle industry earnings. The earnings of pig farmers were still under pressure from weak terms of trade between the settlement price of pork and the price of pig feed.

In recent years, the agricultural sector has benefited from low interest rates. The sector's total debt to banking institutions and mortgage credit institutions, calculated in current prices, has more than doubled over the last decade, amounting to kr. 336 billion at the end of 2010, cf. the Chart. Growth in the agricultural sector's debt has been significantly higher than growth in agricultural earnings, presumably reflecting speculation in land, which has only been possible because of easy access to external financing. The lion's share of the sector's debt is in the form of variable-rate loans, posing a special challenge in the event of interest-rate rises.

THE AGRICULTURAL SECTOR'S DEBT TO BANKING INSTITUTIONS AND MORTGAGE CREDIT INSTITUTIONS



Source: Danmarks Nationalbank.

Prices of farm properties escalated from 2006 to mid-2008. Since then prices have fallen back, but the low interest rate, in combination with a reduction in property taxes, has halted the fall in prices. For newly established farmers with high debt, falling property prices may result in technical insolvency – and thus elevated risk of credit losses for lenders. However, the productivity of the individual farm is still the key factor when it comes to the ability to service the debt and achieve an operating profit.

Viewed in isolation, lower estimated failure rates indicate lower impairment charges on corporate loans in 2011. The expected losses of individual banking institutions depend not only on their exposure to various sectors but also on the distribution of their loans between different-sized companies.

The agricultural sector is not included in Danmarks Nationalbank's failure-rate model. The agricultural sector has been in dire financial straits in recent years, and due to high indebtedness, this sector is vulnerable to increases in interest rates, cf. Box 7.

HOUSEHOLDS

Banking institutions and mortgage-credit institutes are exposed to the households' ability to service their loans as well as the value of the assets, primarily houses, pledged as collateral for the loans. Danish household debt amounted to approximately kr. 2,700 billion in 2010, having doubled since 2001, when it was approximately kr. 1,300 billion. The household debt to disposable income ratio has increased from just over 200 per cent to just over 300 per cent, cf. Chart 40. Danish households differ from other Nordic households by having a higher debt ratio, reflecting factors such as the easily accessible and well-developed Danish mortgage-credit market and differences in pensions.[1]

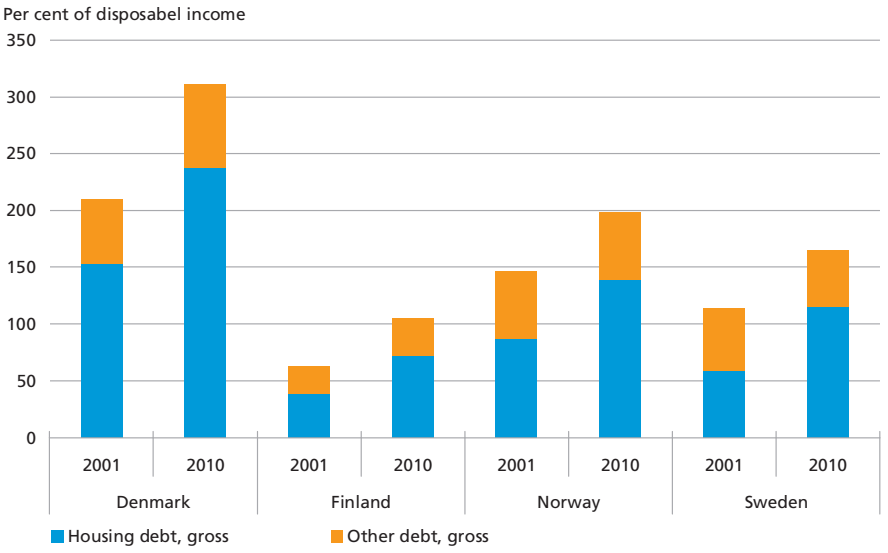
Despite their high level of debt, Danish households have overall fared well through the financial crisis in recent years. The arrears ratios of mortgage-credit institutes remain low, while losses on households in the banking sector have been limited compared with the crisis in the early 1990s, reflecting a lower level of unemployment and interest rates in the current situation.

In the period from 2001 to 2010, the assets of Danish households rose at an even higher rate than their debt. Net wealth increased from just over 360 per cent of disposable income in 2001 to just over 460 per cent in 2010, cf. Chart 41, driven mainly by growing pension wealth and a rise in unlisted shares.

While the Nordic countries were at the same level in 2001, Denmark and Sweden had somewhat higher net wealth than Norway and Finland by 2010. Cross-country comparisons of net wealth are subject to some uncertainty, however, especially in terms of the size of housing wealth and unlisted shares.

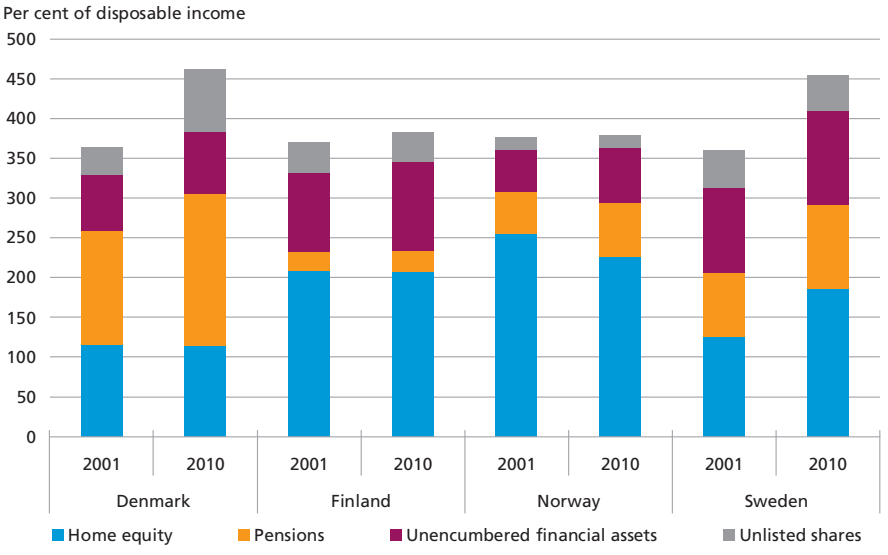
[1] The IMF has constructed an index of the level of development of national financial markets for housing loans. According to this index, Denmark has one of the world's most well-developed financial markets for housing loans, cf. IMF, The Changing House Cycle and the Implications for Monetary Policy, *World Economic Outlook*, Chapter 3, 2008.

HOUSEHOLD DEBT Chart 40



Note: Debt of the aggregate household sector, i.e. including the self-employed e.g. farmers. In 2010, Danish households had unutilised mortgage loans totalling approximately kr. 60 billion. These loans increase the gross debt and assets.
Source: Own calculations based on figures from Danmarks Nationalbank, Statistics Denmark, Eurostat, Statistics Finland, Statistics Norway and Statistics Sweden.

NET HOUSEHOLD WEALTH Chart 41



Note: Net wealth of the aggregate household sector, i.e. including the self-employed e.g. farmers. Home equity is the difference between the housing market value (excluding agricultural land and other undeveloped land owned by the household sector) and total housing loans. Share certificates regarded as financial assets in the national accounts are included as housing wealth. Pension wealth is estimated net values based on tax rates reported in the OECD report "Pensions at a Glance, 2011". Unencumbered financial assets are financial assets other than pension assets and unlisted shares less non-housing debt. Unlisted shares also include unlisted equity securities.
Source: Own calculations based on figures from Danmarks Nationalbank, Statistics Denmark, Eurostat, Statistics Finland, Statistics Norway and Statistics Sweden.

Furthermore, household net wealth cannot be considered in isolation from the rest of the economy. For instance, the size of the government debt and pressure on public finances from demographic changes could mean that households must expect higher taxes or poorer public service in the future. This points towards a build-up of household net wealth. The public sectors in Denmark, Finland, Norway and Sweden all have low debt levels or net wealth. In Norway, the massive public oil wealth may reduce the incentive of Norwegian households to save.

Denmark stands out from the other countries in that a large part of net wealth is pension savings. The rise in Danish household pension wealth during the last 20-30 years has taken place as labour-market pensions have become more widespread. Due to the high level of pension wealth, large segments of the elderly of the future will enjoy relatively high incomes when they retire. This e.g. reduces the need for people to be free of debt before they retire. Thus the widespread use of labour-market pensions may have contributed to increasing household debt. However, since pension wealth is less liquid than other household assets, this development has rendered households more vulnerable.

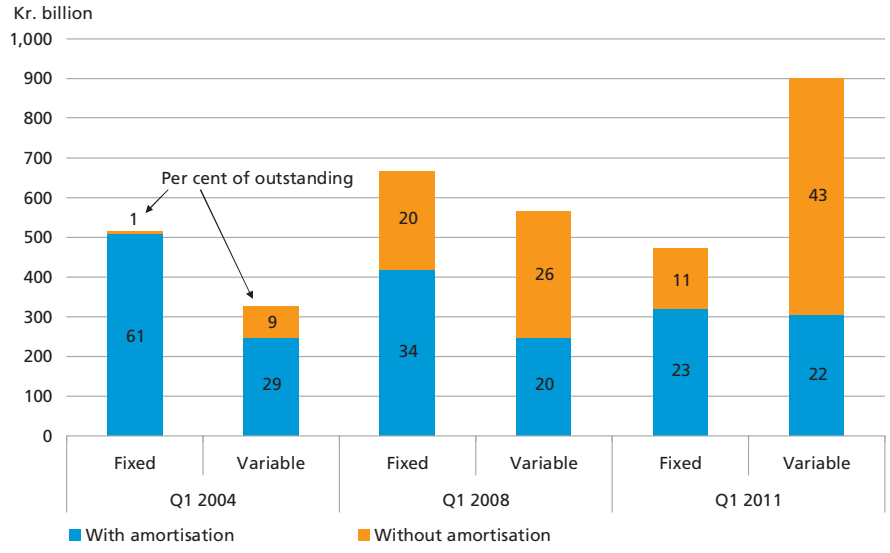
The combination of high debt, many illiquid assets and a preceding period with falling house prices has increased the exposure of households to e.g. changes in interest rates and temporary loss of income. Despite the large and increasing net wealth, households should therefore ensure that their finances are sufficiently resilient in the coming years. Lenders should perform realistic "stress tests" of the households' ability to service their debt under different conditions when offering advice and considering loan applications.

Composition of mortgage-credit debt

Household debt is comprised primarily of mortgage-credit loans. Traditionally, mortgage-credit loans were fixed-rate loans with ongoing amortisation. Product development and liberalisation in the mortgage-credit sector have widened the scope for variable-rate loans and deferred-amortisation loans. While increasing the flexibility of households, both loan types may also augment the risk to individual households and to society in general if the opportunities are not used expediently.

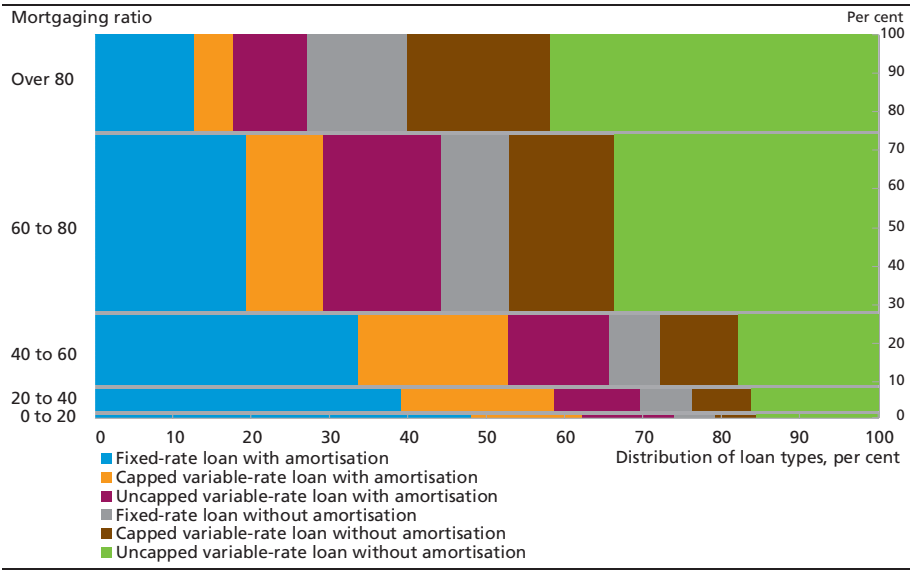
At the end of the 1st quarter of 2011, variable-rate loans accounted for 66 per cent of total loans, while deferred-amortisation loans accounted for 54 per cent, cf. Chart 42. Variable-rate deferred amortisation loans accounted for 43 per cent. The households' use of variable-rate loans and deferred amortisation loans has changed significantly during recent years. In the 1st quarter of 2004, 39 per cent of loans were variable-rate loans,

HOUSEHOLD MORTGAGE-CREDIT DEBT BROKEN DOWN BY LOAN TYPE — Chart 42



Note: Based on the mortgage-credit institutes' lending against owner-occupied dwellings as collateral. The figures in the bars in this Chart show the percentages of fixed/variable-rate loans with/without amortisation, respectively. Variable-rate loans comprise adjustable-rate loans and loans based on long-term bonds with variable rates.
Source: Danmarks Nationalbank.

CORRELATION BETWEEN LOAN TYPES AND MORTGAGING RATIOS FOR SINGLE-FAMILY HOMES AND OWNER-OCCUPIED FLATS, END-2010 — Chart 43



Note: For a more detailed description of the data set, see Box 8. The Y axis shows the percentage distribution of the household loans by mortgaging ratio for five groups: 0 to 20, 20 to 40, 40 to 60, 60 to 80 and over 80 per cent. The X axis shows the percentage distribution of loan types within the respective mortgaging ratio groups. This distribution is weighted by the outstanding bond debt. The outstanding bond debt and property values have been calculated as at 31 December 2010.
Source: Own calculations.

DATA RELATING TO THE HOUSEHOLDS' MORTGAGE-CREDIT LOANS Box 8

The data applied in the analysis is based on a small cross-section of Danish households. The data set contains information on the mortgage-credit loans of each household and an estimate of the market value of its home. Information on the annual income is also included, but only for households wishing to mortgage more than 60 per cent of the value of their home at the time of mortgaging. Consequently, in calculations including income, data has a selection bias. With this selection, homeowners that are not included seen as a group have more home equity when the loan is taken out and lower average indebtedness than the sector overall. When the income data is used, only households with disposable incomes exceeding kr. 100,000 at the time of disbursement are included. Disposable income is based on information on annual income before tax.

while deferred-amortisation loans, which were introduced in 2003, accounted for approximately 10 per cent.

Variable-rate and/or deferred-amortisation loans are most frequently used for homes with a high mortgaging ratio, cf. Chart 43. For homes with a mortgaging ratio of between 60 and 80 per cent or over 80 per cent, the most risky loan types with deferred amortisation and variable rate account for 34 per cent and 42 per cent, respectively, according to an analysis of mortgage-credit loans in a small section of Danish households, cf. Box 8.[1]

The most risky loan types have appealed less to households with a low mortgaging ratio. One reason for this is that these households have, to a larger extent, obtained their loans before the introduction of adjustable-rate and deferred-amortisation loans.

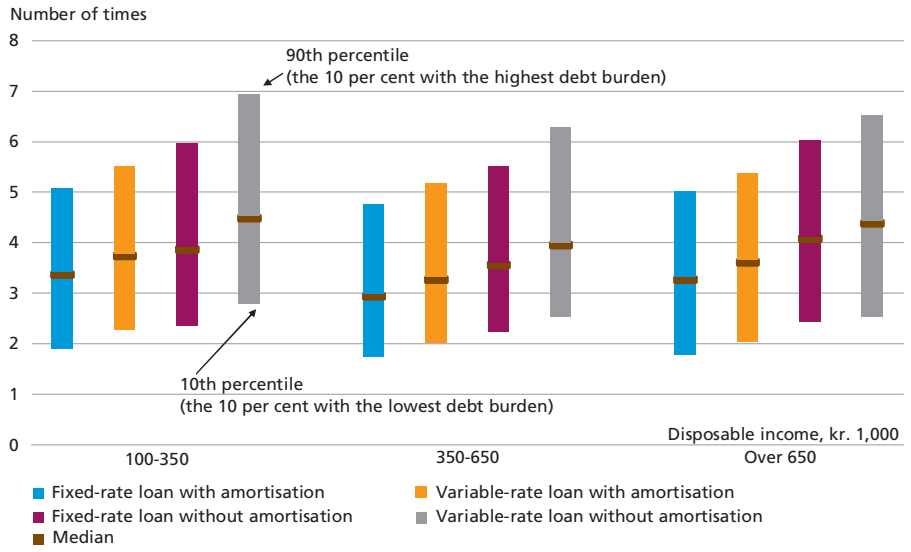
A corresponding analysis in *Financial stability*, 1st half 2009, based on data from 2008, showed the same trend, but the combination of high mortgaging ratios and higher-risk borrowing has been reinforced during recent years. Thus variable-rate loans (uncapped) without amortisation have risen from 17 per cent of the outstanding bond debt in homes with mortgaging ratios between 60 per cent and 80 per cent in 2008 to 34 per cent in 2010, as stated above.

Historically, interest rates on variable-rate loans have been lower than rates on fixed-rate loans. This reflects that borrowers with variable-rate loans assume an interest-rate risk that does not exist for fixed-rate loans. This interest-rate risk may materialise in the form of higher repayments in case of interest-rate rises. If a home is fully leveraged, with a deferred-amortisation loan, a financial buffer is not created on an ongoing basis through instalments. For loans raised since 2004, the loan amount is, on

[1] Mortgage-credit loans can be taken out for up to 80 per cent of the value of the home, but mortgaging ratios may also rise beyond 80 per cent if the value of the house falls.

MORTGAGE-CREDIT DEBT AS A RATIO OF INCOME, BROKEN DOWN BY LOAN TYPE

Chart 44



Note: The data basis is households having obtained their mortgage-credit loans since the beginning of 2004. For a more detailed description of the data set, see Box 8. Mortgage-credit debt is calculated in terms of principals as a ratio of household disposable income at the time of disbursement. In order to separate the impact of different loan types, only households with just one type of loan are included. Variable-rate loans comprise adjustable-rate loans and loans based on long-term bonds with variable rates.

Source: Own calculations.

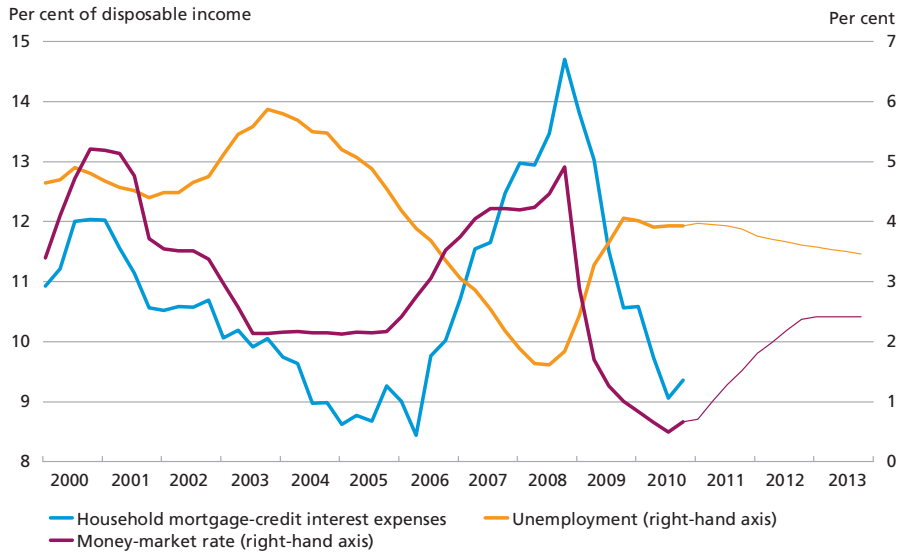
average, higher for variable-rate and deferred-amortisation loans than for fixed-rate loans with amortisation. A representative[1] household with annual income after tax in excess of kr. 350,000 and variable-rate loans with deferred amortisation typically borrows the equivalent of about 4 times its net annual income, cf. Chart 44. A household choosing fixed-rate loans with amortisation typically borrows about 3 times its annual income. This could indicate that households have taken advantage of the lower repayments on adjustable-rate and deferred-amortisation loans to service higher loans. This tallies well with the observation that, in the period until 2008, higher house prices were driven, to a considerable extent, by the access to deferred-amortisation loans and low interest costs on variable-rate loans.[2]

This pattern could indicate that the households with the most risky loans are less resilient in the event of interest-rate rises or loss of income. The current range of financing options and the advice offered can encourage households to operate with smaller financial buffers by way of home

1 Median household in the data set, cf. Box 8.

2 Cf. Niels Arne Dam, Tina Saaby Hvolbøl, Erik Haller Pedersen, Peter Birch Sørensen and Susanne Hougaard Thamsborg, Developments in the market for owner-occupied housing in recent years – can house prices be explained? Danmarks Nationalbank, *Monetary Review,* 1st Quarter 2011, Part 2.

HOUSEHOLD MORTGAGE-CREDIT INTEREST EXPENSES, UNEMPLOYMENT AND 3-MONTH UNCOLLATERALISED MONEY-MARKET RATE Chart 45



Note: The fine lines indicate the baseline scenario for the variables in the stress test, cf. Chapter 4.
Source: Danmarks Nationalbank and Statistics Denmark.

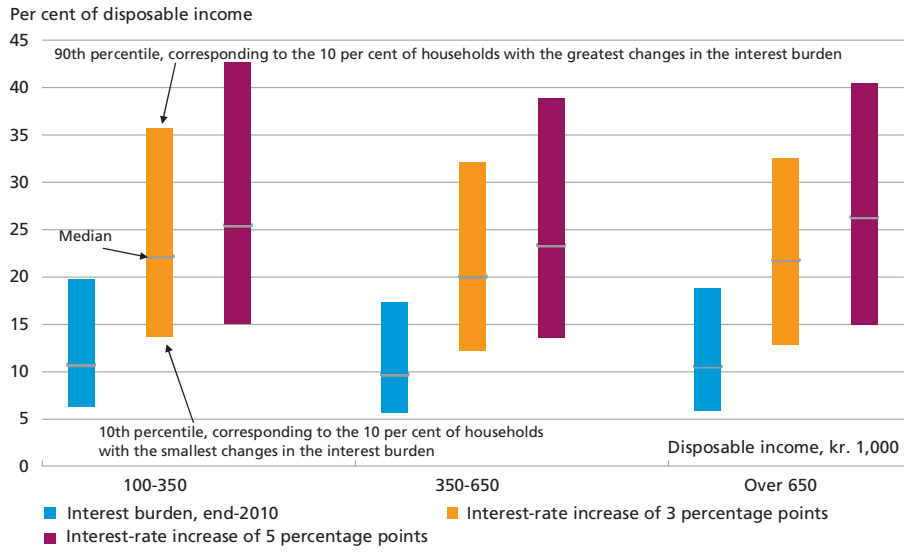
equity than traditional loan types. High exposure among many households has a negative impact on financial stability.

Household exposure to changes in interest rates

The proportion of mortgage-credit debt linked to short-term interest rates has increased to 66 per cent, cf. Chart 42. As a result, changes in short-term interest rates in recent years have had greater impact on household interest costs, cf. Chart 45. It also means that future interest-rate rises will have a stronger impact on household finances and affect their ability to service their debt – especially if interest-rate rises do not coincide with positive cyclical trends in Denmark. However, to the extent that the Danish economy is in phase with that of the euro area and Danish interest rates fluctuate with those of the euro area, interest-rate rises will coincide with a favourable development in unemployment, and lower unemployment makes households more resilient to a higher level of interest rates.

Household exposure to changes in interest rates may be illustrated by calculating the change in household interest burdens (interest costs as a share of disposable income) if short-term interest rates go up. A 3 percentage point increase in interest rates, equivalent to developments in short-term money-market rates from 2005 to 2008, causes the interest burden of all income brackets to virtually double. For the 10 per cent of

DEVELOPMENT IN INTEREST BURDEN IN CASE OF AN INCREASE IN SHORT-TERM INTEREST RATES OF 3 AND 5 PERCENTAGE POINTS, RESPECTIVELY, END-2010 Chart 46



Note: The data set is comprised exclusively of households having obtained at least one mortgage-credit loan since 2006. For a more detailed description of the data set, see Box 8. Short-term interest rates are defined as the rate of a variable-rate loan irrespective of the fixed-interest period. Interest costs are interest payments on mortgage-credit debt only. The interest burden has been calculated as interest costs as a ratio of disposable income.
Source: Own calculations.

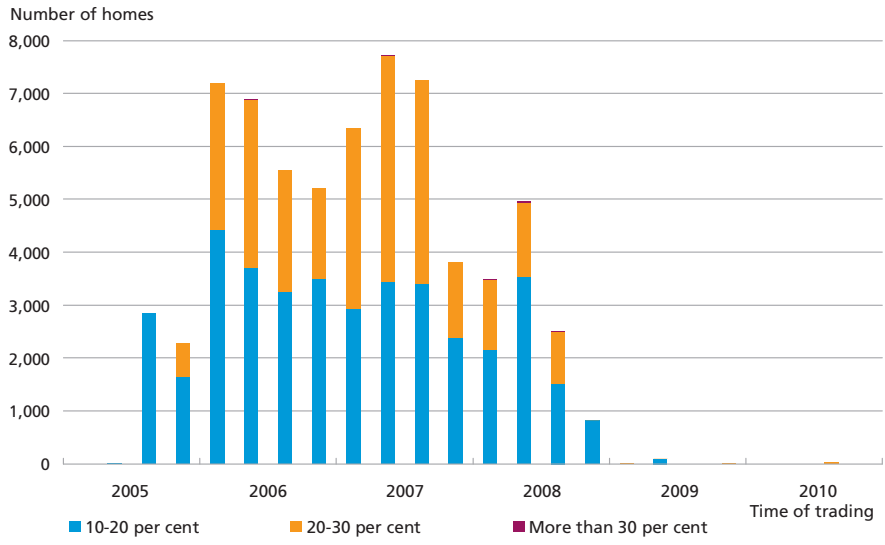
households experiencing the steepest increase in the interest burden, interest costs will rise to 30 per cent of the disposable income or more, cf. Chart 46. Depending on the specific circumstances, this could represent quite a strain on household finances.

House-price developments and deferred-amortisation loans

Since the 2nd quarter of 2007, the prices of single-family houses (including terraced houses) and owner-occupied flats have fallen by 13 and 17 per cent, respectively, for Denmark overall, but there are large regional differences. The vast majority of homeowners still have positive home equity, but for some households who have bought their home within the last few years prices may have fallen so much that the home equity is now negative. Since 2004, there have been approximately 67,000 transactions where the value of the house has fallen by more than 10 per cent since the time of trading, and approximately 27,000 transactions where it has fallen by more than 20 per cent, cf. Chart 47. Whether this results in negative home equity for the individual household obviously depends on the initial mortgaging ratio.

As long as the home is not sold and loans can be serviced, negative home equity has limited significance. However, unemployment, divorce or

NUMBER OF HOUSING TRANSACTIONS FOR WHICH THE PRICE FELL BY MORE THAN 10 PER CENT UNTIL Q4 2010 Chart 47



Note: Calculation based on house price developments and the number of transactions in owner-occupied flats, single-family houses and terraced houses for Denmark overall.
Source: Danish Mortgage Banks' Federation.

other social events could compel households to sell or reduce their ability to service the debt, and in that case negative home equity will place them in a difficult financial situation. Moreover, negative home equity could reduce the labour-market mobility of homeowners. At the same time, decreasing house prices mean that the collateral pledged to banking institutions and mortgage-credit institutes is eroded. These factors emphasise the importance of creating a financial buffer through mortgage-credit repayments and by factoring in the possibility of higher interest rates.

October 2003 saw the introduction of deferred-amortisation loans and it became possible for homeowners to raise 30-year mortgage-credit loans with a deferred-amortisation period of up to 10 years. The deferred-amortisation period of the first loans expires in 2013 and in general this will result in a substantial increase in instalments. This underlines that homeowners who opt for deferred-amortisation loans should be forward-looking and structure their finances for the expiry of the deferred-amortisation period well in advance. If homeowners wish to continue the period of deferred amortisation, they need to redeem the existing loan and raise a new deferred-amortisation loan. If the price of the house has dropped during the deferred-amortisation period, so that the mortgaging ratio exceeds 80 per cent of the value of the house, it will not be possible to raise a loan of the same size.

4. Stress Test

The stress test shows that the large Danish banking institutions overall and under the current capital requirements are capitalised to meet both the expected economic development and a more negative development than expected. The new capital adequacy rules that are expected to be phased in from 2013 will tighten the requirements for the banks' capital. Under these requirements, parts of the sector will not be sufficiently capitalised to meet negative shocks to the economy. The institutions should take this factor into account in their capital planning and use the phasing-in period to improve their capital bases. They should also be aware that market participants may expect them to meet the requirements earlier.

BACKGROUND

Danmarks Nationalbank's stress test is an analytical tool, testing whether Danish banking institutions are sufficiently capitalised to meet a more negative development than expected by specifying a number of stress scenarios.[1] The 15 largest Danish banking institutions, accounting for 88 per cent of the aggregate loans and guarantees of Danish banking institutions at end-2010, are included in the test.[2]

The four largest Danish banking institutions (Danske Bank, Jyske Bank, Nykredit Bank and Sydbank; Nordea participates through its Swedish parent bank) also participate in a stress test of the largest European banks conducted under the auspices of the European Banking Authority, EBA. The result of this year's stress test will be made public in June 2011.

SCENARIOS

The stress test analyses four macroeconomic scenarios: a baseline scenario representing the expected economic development, and three stress scenarios in which the economic development is more negative than expected, cf. Table 3. The baseline scenario is Danmarks Nationalbank's most recently published economic forecast, see *Monetary Review*, 1st Quarter 2011, and it is considered the most likely outlook for the Danish

1 For a description of Danmarks Nationalbank's stress test model, see *Financial Stability*, 2008.
2 Compared with the most recent stress test conducted by Danmarks Nationalbank, Stress Tests 2nd Half 2010, Amagerbanken has been excluded from the basis of calculation, while Sparekassen Kronjylland and Sammenslutningen Danske Andelskasser have been included. This population matches groups 1 and 2* as defined in Chapter 1, Box 1.

BASELINE AND STRESS SCENARIOS, SELECTED KEY VARIABLES Table 3

	Baseline scenarios	Scenario 1	Scenario 2	Scenario 3
2011				
GDP, per cent, year-on-year	1.9	1.6	1.2	0.8
Private consumption, per cent year-on-year	1.9	1.4	1.2	0.7
Export market growth, per cent year-on-year	7.5	7.5	3.4	2.8
Unemployment rate	3.9	4.2	4.2	4.3
House prices, per cent, year-on-year	0.0	-3.3	-4.5	-3.4
Bond yield, per cent, year-on-year	3.2	3.4	4.7	4.3
2012				
GDP, per cent, year-on-year	1.8	0.9	-0.3	-1.8
Private consumption, per cent year-on-year	2.4	0.3	0.4	-0.7
Export market growth, per cent year-on-year	6.5	6.5	2.4	-4.9
Unemployment rate	3.7	4.6	5.1	6.1
House prices, per cent, year-on-year	1.2	-9.7	-6.9	-6.2
Bond yield, per cent, year-on-year	3.8	4.2	6.8	6.3
2013				
GDP, per cent, year-on-year	1.5	1.0	0.1	-1.2
Private consumption, per cent year-on-year	1.5	0.3	0.4	0.5
Export market growth, per cent year-on-year	5.0	5.0	4.5	-0.5
Unemployment rate	3.5	5.0	6.1	8.5
House prices, per cent, year-on-year	1.5	-5.1	-2.7	-2.7
Bond yield, per cent, year-on-year	4.3	4.6	7.3	6.8

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

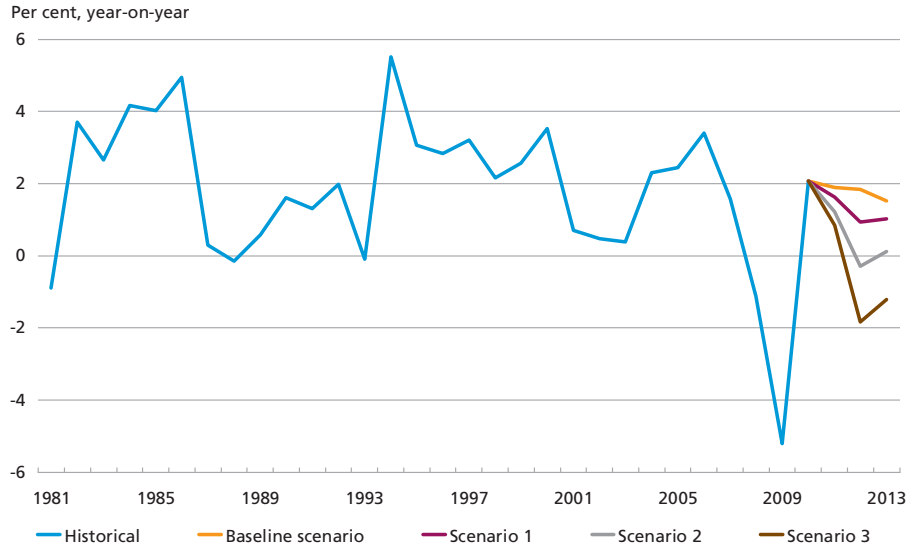
economy in the period 2011 to 2013. Scenarios 1 and 2 are both stress scenarios with low probability. Scenario 3 tests the institutions' capital strength during an extremely negative macroeconomic development. Appendix 3 provides a detailed presentation of the macroeconomic scenarios.

Baseline scenario

The baseline scenario reflects that the Danish economy is slowly recovering from the crisis. The considerable negative GDP growth in 2009 turned positive in 2010, cf. Chart 48. In this scenario, GDP grows by a little less than 2 per cent in 2011 and 2012, corresponding to the growth rate in 2010, while the Danish economy is approaching normal capacity utilisation in 2013 when GDP growth decreases to around 1.5 per cent. The economic recovery in 2010 has not yet really fed through to the labour market, but it is expected to have a lagged effect in 2011, with unemployment gradually falling from 2011 to 2013, cf. Chart 49.

Comparing the forecast with the baseline scenario applied in *Stress Tests,* 2nd Half 2010, it shows that the most significant changes are an upward revision of export market growth, slightly higher interest rates and a more subdued house price development in the current baseline scenario.

GROWTH IN REAL GDP Chart 48

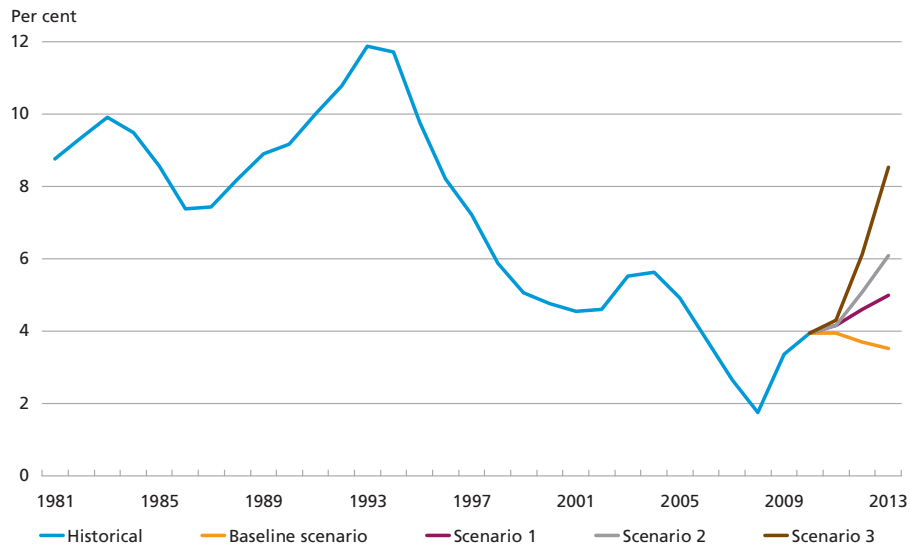


Source: Statistics Denmark and own calculations.

Scenario 1

Scenario 1 entails negative shocks to private consumption, private investment, employment and house prices. This scenario tests the banking institutions' resilience to an isolated economic downturn in the Danish economy, a situation in which interest rates are assumed to rise slightly more than in the baseline scenario as a result of higher risk premiums. House

UNEMPLOYMENT Chart 49



Source: Statistics Denmark and own calculations.

prices take a particularly large downturn, and the final level is approximately 19 per cent lower than in the baseline scenario, cf. Table 3. Unemployment rises to around 5 per cent in 2013. As a consequence of the economic development, accumulated GDP growth over the period is 1.6 percentage points lower than in the baseline scenario.

Scenario 2

Scenario 2 entails negative shocks to interest rates, export market growth, private consumption and private investment. In particular, there is a significant shock to interest rates. This scenario tests the banking institutions' resilience to a sudden and very strong interest-rate increase, e.g. because an escalation of the international debt crisis leads to rising interest rates in parts of Europe. In Denmark, the average bond yield is assumed to be 3 percentage points higher than in the baseline scenario in the second and third years of the scenario. This development leads to falling house prices, among other things, and by the end of the scenario house prices are approximately 16 per cent lower than in the baseline scenario. As a result of the economic development, accumulated growth in GDP over the period is slightly more than 4 percentage points lower than in the baseline scenario, cf. Table 3.

Scenario 3

Scenario 3 entails negative shocks to export market growth, interest rates, private consumption and private investment. Export market growth is hit by a particularly severe negative shock and accumulated over the entire period it is around 22 percentage points lower than in the baseline scenario. The average bond yield is up to 2.5 percentage points higher than in the baseline scenario, cf. Table 3. As a result of the economic development, GDP growth is negative in 2012 and 2013, and on an accumulated basis it is approximately 7 percentage points lower than in the baseline scenario during the period. Further, this development means that house prices are 14 per cent lower and unemployment 5 percentage points higher at the end of the scenario than in the baseline scenario.

The combination of strongly negative economic trends and sharp interest-rate increases has been constructed in order to obtain a very high level of stress. This scenario is not considered plausible in the current situation in Denmark.

RESULTS

Danmarks Nationalbank's macro stress test model projects the banking institutions' income statements and balance-sheet totals. The projection

WRITE-DOWNS IN FOREIGN ENTITIES Box 9

The stress test model is based on the development in the Danish economy, and generally the estimated Danish loan impairment charge ratios for all banking institutions' loans and guarantees are applied, regardless of the geographical location of the exposures. As the model tests banking institutions under Danish supervision, foreign subsidiaries of Danish banking institutions are not included.

The only institution in the population with substantial foreign exposures is Danske Bank A/S, which has significant credit exposures in Sweden, Norway, Ireland, the UK, the Baltic countries and North America. Danske Bank has recorded significant loan impairment charges on its exposures in Ireland over the past two years. The loan impairment charges were primarily due to losses on the property sector as a result of an extremely weak commercial property market. According to Danske Bank's Annual Report 2010, there is risk of further large loan impairment charges.

In March 2011, the Central Bank of Ireland conducted a stress test of four of the country's largest banks. The expected loss levels, which were presented in a baseline scenario and a stress scenario, were significant. In the baseline scenario of the stress test, total losses in the period 2011-13 amounted to 7.3 per cent, while they reached 10.1 per cent for the four banks overall in the stress scenario.

Danmarks Nationalbank's stress test applies the loss ratios from the Irish stress test for estimating the loan impairment charges of Danske Bank's exposures in Ireland, taking the sectoral breakdown into account. Especially the property sector will require large loan impairment charges, cf. the Table. In the baseline scenario and scenario 1, the estimated losses from the baseline scenario in the Irish stress test are applied. In stress scenarios 2 and 3, the estimated loss ratios from the stress scenario are applied. The bank's total credit exposure in Ireland can be approximated by the group's credit exposure in connection with banking activities in Ireland, which amounted to around kr. 63 billion at end-2010, corresponding to approximately 6 per cent of the institution's total loans and guarantees. For the banks' other foreign exposures, the estimated Danish loan impairment charge ratios are applied; overall this is deemed to be a conservative estimate.

ESTIMATED LOSS RATIOS, TOTAL 2011-13

	Danske Bank's exposure, percentage distribution	Irish stress tests, baseline scenario, loss ratios	Irish stress tests, stress scenario, loss ratios
Mortgage loans, retail	39,5	4,1	6,7
Corporate and small and medium-sized enterprises	23,9	6,2	8,3
Commercial property	30,0	17,7	22,1
Consumer loans etc.	3,5	16,1	20,7
Central and local government ..	3,0	-	-

Note: Loans to central and local government are assumed not to entail any losses. The sectoral breakdown of Danske Bank's exposures is reallocated to match the sectoral breakdown applied in the Irish stress test. Commercial property and entrepreneurs are combined into the commercial property sector, and the remaining corporate sector is aggregated to constitute the corporate sector and small and medium-sized enterprises. It is assumed that retail mortgage loans and consumer loans in Danske Bank's exposures to retail customers have a similar relative relationship to what is seen in the Irish banks, i.e. 8 per cent of Danske Bank's exposures to retail customers are assumed to be consumer loans.

Source: Danske Bank's *Risk Management 2010 (Credit exposure, lending activities, broken down by industry) and The Financial Measures Programme Report*, Central Bank of Ireland, March 2011.

applies an estimated development in earnings and loan impairment charges based on the development in the macroeconomic scenarios specified. The institutions' resilience to future challenges is assessed on the basis of the development in their capitalisation. The analysis of the results focuses on both the current capital requirements and the future requirements that are expected to be implemented via EU legislation as a consequence of Basel III, cf. Chapter 6. In this chapter, the coming capital requirements are referred to as Basel III.

It is important to be aware of the limitations of the stress test, as a banking institution may face problems for other reasons than an eroded capital base. For instance, it could be short of liquidity, cf. Chapter 2. However, one reason that liquidity risks materialise is often concern about the institution's capitalisation. During the stress period, the debt that the institutions have been able to issue with individual government guarantees in connection with Bank Rescue Package 2 matures. The stress test assumes that the institutions can refinance these loans on conditions corresponding to the current conditions.

The institutions' loan impairment charges have been estimated on the basis of loans and loan impairment charges in Denmark. With respect to Danske Bank's exposure in Ireland, loan impairment charges based on a stress test published by the Irish authorities in March 2011 have been applied, cf. Box 9.

The following describes developments in banking institutions' earnings and loan impairment charges as key variables relative to trends in the capital base. Subsequently, the results of the stress test are outlined in relation to the most important types of regulatory capital.

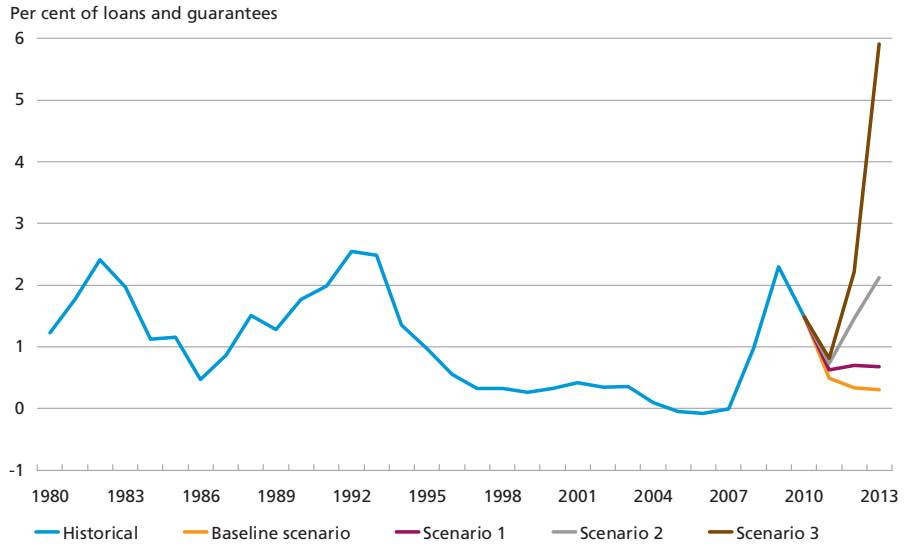
Earnings

Earnings were on the rise in 2010, affected by improved macroeconomic conditions both in Denmark and globally, cf. Chapter 1. Higher earnings have a positive effect on the banking institutions as they will allow them to absorb larger loan impairment charges without drawing on their capital base. Earnings are driven by developments in net interest income in all scenarios and fall slightly from 2010 to 2011, after which they show an upward trend. Earnings rise a little more in the baseline scenario than in the stress scenarios, but by the end of all scenarios they have reached a higher level than in 2010.

Loan impairment charges

In 2009, the sector recorded the largest loan impairment charges since the early 1990s, while they fell considerably in 2010. In all scenarios, loan impairment charges decline further in 2011. Under the baseline scen-

ANNUAL LOAN IMPAIRMENT CHARGE RATIOS Chart 50



Note: Weighted average. The historical series until 2010 is based on banking institutions in the Danish Financial Supervisory Authority's groups 1-3. The estimated loan impairment charges in 2011-13 are based on the banking institutions included in the stress test. Compared with previous stress tests, the data forming the basis for the estimation of loan impairment charges has been expanded by three historical observations for 1991 to 1993.

Source: Baldvinsson et al. (2005), *Danish Banks*, 5th edition, Forlaget Thomson, Danish Financial Supervisory Authority and own calculations.

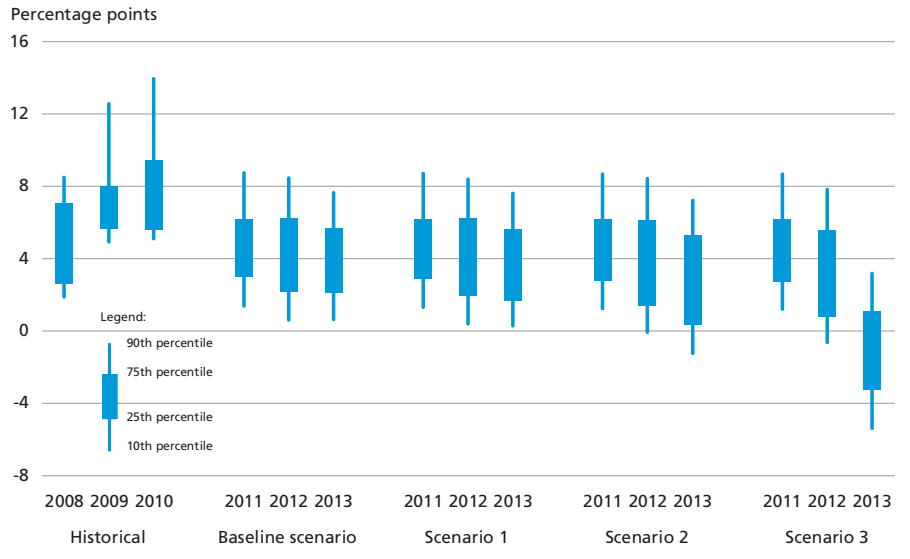
ario, they will subsequently stay around 0.3 per cent annually, cf. Chart 50.

Loan impairment charges in scenario 1 decline from 2010 to 2011 and then remain at around 0.7 per cent annually for the rest of the period. The level of loan impairment charges in scenario 2 rises to 2.1 per cent at the end of the period, corresponding to the level in 2009. Overall, loan impairment charges total 4.3 per cent during the three years covered by the scenario. In scenario 3, loan impairment charges reach an annual level of 5.9 per cent by 2013, which is substantially higher than what has been observed in Denmark in recent times. Total loan impairment charges amount to 8.9 per cent over the three years covered by the scenario.

Total capital and excess capital adequacy

In the years ahead, the banking institutions have to prepare for the implementation of tighter capital requirements as a consequence of the phasing-in of Basel III. The new capital adequacy rules imply stronger focus on and stricter requirements for Common Equity Tier 1, which is the most loss-absorbing type of capital. In the existing regulation, there is more focus on the total capital, which will remain an essential element of regulation, also in future, cf. Chapter 6.

EXCESS CAPITAL ADEQUACY, INCLUDING PHASING-IN OF BASEL III IN 2013 Chart 51



Note: The historical development describes the average of total capital ratios and is thus not adjusted for individual capital needs. When the 2010 figures are adjusted for individual capital needs, the excess capital adequacy is very close to the level in the baseline scenario for 2011. Assumptions regarding capital outflows, however, also result in a small difference.

Source: Danish Financial Supervisory Authority and own calculations.

The excess capital adequacy of a banking institution is the difference between the total capital and the individual capital need, which is to reflect an institution's risks that are not covered by the 8-per-cent capital requirement. The stress test assumes that the individual capital need is unchanged during the stress test period.

In the results of the stress test, the institutions' excess capital adequacy is affected if subordinated capital matures. Subordinated capital with an incentive to repay in the form of an interest rate step-up is assumed to be terminated when the incentive takes effect. Neither maturing nor terminated capital is replaced by other capital which can be included in the calculation of the total capital. This contributes to a downward trend in the institutions' excess capital adequacy. In addition, the capital is affected by the phasing-in of Basel III, which implies tighter rules for Additional Tier 1 from 2013. As the rules are phased in gradually, 90 per cent of the existing Additional Tier 1 will still be eligible for inclusion in the total capital in 2013.[1]

[1] Under the new rules, Additional Tier 1 requirements are tightened. The stress test assumes that none of the current Additional Tier 1 will meet the new requirements. The phasing-out of Additional Tier 1 will span 10 years, and it is therefore assumed that 90 per cent of the current Additional Tier 1 capital can be included in Tier 1 capital, and hence in the capital base, in 2013. Injection of capital from the government in connection with Bank Rescue Package 2 is exempt from this phasing-out, and the current rules will apply during the stress test period.

The stress test shows that the excess capital adequacy changes only marginally in the baseline scenario though the sector overall is making a profit and in nominal terms the Common Equity Tier 1 is growing, cf. Chart 51. This finding is caused by a model assumption stating that profitable institutions will boost their balance-sheet totals by an amount corresponding to the volume which will keep their excess capital adequacy fixed. If, on the other hand, it is assumed that the balance- sheet totals and risk-weighted assets are not increased, the excess capital adequacy will generally increase. If institutions also keep the volume of debt that can be included in the calculation of excess capital adequacy unchanged, retained profits during the period will increase the total excess capital adequacy for the sector by approximately 2 percentage points. However, there are institutions that will need to increase their capitalisation or reduce their risks further in order to improve their capital base.

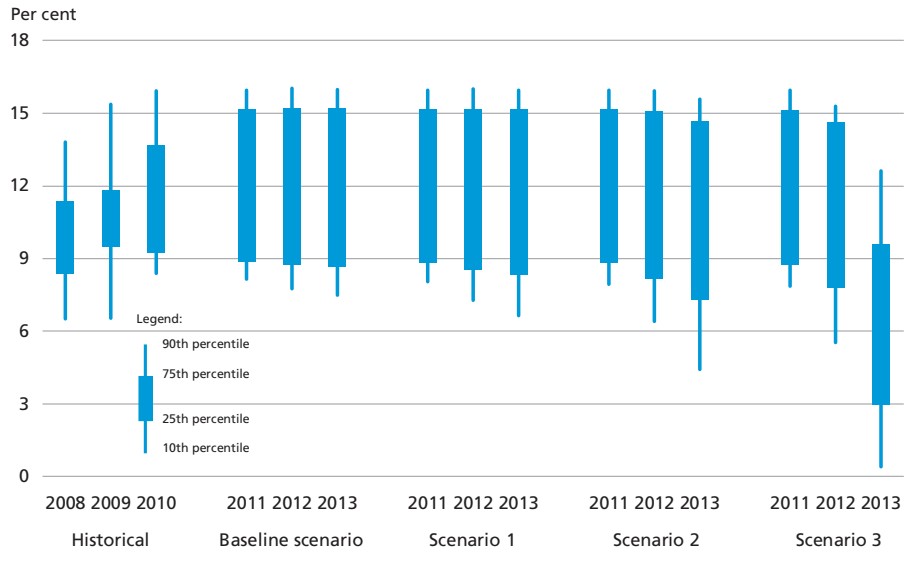
In scenario 1, the excess capital adequacy of some institutions falls slightly. However, most institutions can absorb the loan impairment charges in their earnings without drawing on the capital base. In scenario 2, the institutions' excess capital adequacy develops more negatively as a result of higher loan impairment charges, and a small part of the sector will need to strengthen its capital base in order to meet the statutory solvency requirements. In scenario 3, the sector overall is under pressure already in 2012, and most institutions will be unable to meet the solvency requirement by the end of 2013.

Common Equity Tier 1

Under the existing regulation, the individual institution must hold at least 2 per cent Common Equity Tier 1, but the minimum requirement may be higher, depending on factors such as the institution's individual capital need and use of Additional Tier 1 and Tier 2. Once the Basel requirement for Common Equity Tier 1 has been fully phased in by 2015, the requirement will be 4.5 per cent of the risk-weighted assets. However, the capital requirement will be tightened already from the beginning of the phasing-in period in 2013 when the requirement for Common Equity Tier 1 is set to 3.5 per cent. Moreover, the Basel III rules imply the establishment of capital buffers totalling 2.5-5 per cent made up of Common Equity Tier 1. This brings the minimum requirement for the institutions' Common Equity Tier 1 to 7-9.5 per cent when the rules have been fully phased in. The requirement for buffers is not in effect in 2013.

In the baseline scenario and scenario 1, Common Equity Tier 1 changes only modestly at sector level, and the sector overall holds sufficient Common Equity Tier 1 to meet the minimum requirement in 2013, cf.

COMMON EQUITY TIER 1 Chart 52



Source: Danish Financial Supervisory Authority and own calculations.

Chart 52. In scenario 2, Common Equity Tier 1 declines for a relatively large number of institutions, and a few institutions see a sharp decline at the end of the period.

A small number of institutions retain a stable high level of Common Equity Tier 1 in the baseline scenario, scenarios 1 and 2. The reason is that these institutions have sufficiently high earnings to absorb the relatively high loan impairment charges seen in scenario 2 in particular, thereby achieving positive results. In scenario 3, which has been constructed to test the institutions' capital strength during an extremely negative macroeconomic development, the Common Equity Tier 1 ratio of all institutions declines, and a substantial share of the sector will be struggling to meet the minimum requirement.

The large institutions generally perform better in all scenarios than the medium-sized institutions. Not until the end of scenario 3 are there institutions in group 1 whose Common Equity Tier 1 falls to such an extent that it causes problems in relation to meeting the fully phased-in capital requirements. In all the scenarios outlined, however, all institutions in group 1 meet the Basel III phasing-in requirement in 2013 at the end of the scenario.

5. Danmarks Nationalbank's Oversight of the Financial Infrastructure in Denmark

The Danish payment and settlement systems functioned satisfactorily in 2010. Occasional settlement incidents were followed up by initiatives to improve the systems. In VP settlement, focus is on improving the proportion of equity trades settled on time, and as regards retail payments, the scope for reducing the settlement times is being reviewed. In Danmarks Nationalbank's payment system, Kronos, the participants have continued to reserve ample liquidity relative to their daily payments. This contributes to the resilience of the financial infrastructure in Danish kroner to events affecting liquidity.

A safe and efficient payments infrastructure is important to financial stability. Danmarks Nationalbank is obliged to oversee systemically important payment and settlement systems, i.e. Kronos, the Sumclearing and VP settlement, to ensure the safety and efficiency of these systems. Moreover, Danmarks Nationalbank helps monitor relevant international payment and settlement systems.

The oversight is based on international standards for payment and settlement systems. Today, separate standards apply to various types of financial infrastructures. Based on experience from e.g. the financial crisis, a common set of standards is being prepared under the auspices of BIS with a view to more consistent oversight of various infrastructures. The new standards, "Principles for financial market infrastructures", will be in consultation until 29 July 2011. Final standards are expected to be published in 2012.

Payment systems handle the process from a customer effects a payment transfer until the amount is available in the payee's account, cf. Box 10. In order for all parties involved to have confidence in the payment transfer, the standards impose a number of system requirements, including on the legal foundation, credit and liquidity risk management, safety, operational stability and emergency procedures.

KRONOS

Kronos is Danmarks Nationalbank's system for immediate settlement of large or time-critical payments in Danish kroner, including mon-

CLEARING AND SETTLEMENT OF RETAIL PAYMENTS — Box 10

The processing of retail payments in Denmark can be split into four phases which cover the whole process from when a customer initiates a payment to the receipt of that payment on the recipient's account:

- Customers initiate payments, e.g. via Internet banking. Then the transactions are usually sent for clearing at the Sumclearing and settlement in Danmarks Nationalbank.
- Clearing is the process by which banks' total net receivables or payables are calculated prior to settlement.
- Settlement refers to the actual transfer of money on the banking institutions' accounts in Danmarks Nationalbank.
- Registration is the part of the process which the customers experience, as they are able to view the transactions in their own accounts.

[1] A further description of clearing and settlement in Denmark is given Danmarks Nationalbank, *Payment Systems in Denmark*, 2005.

etary-policy transactions. It is a real time gross settlement system, RTGS.

In 2010, the average daily value of payments settled fell by almost kr. 40 billion, cf. Table 4. The reason is that the banking institutions and mortgage-credit institutes took part in fewer monetary-policy operations with Danmarks Nationalbank. The value of interbank payments rose slightly, but is still significantly below the level prevailing before the financial crisis. Most payments are interbank payments, including customer payments, cf. Box 11.

The participants' disposable liquidity for settlement of payments in Kronos was also markedly higher than their liquidity requirements in 2010, cf. Chart 53. The participants' available liquidity fell slightly in 2010 on the previous year, but overall, the participants still have ample liquidity at their disposal for daily payments. As in the preceding years, the participants' liquidity requirements rose on the first day of the year as a consequence of settlement of the mortgage-credit institutes' auctions of fixed bullets. To

PAYMENTS IN KRONOS, DAILY AVERAGE — Table 4

Kr. billion	2006	2007	2008	2009	2010
Interbank payments	132.2	124.1	119.8	105.5	108.1
Monetary-policy operations	32.3	54.9	88.7	70.3	29.4
Transfers to payment systems	87.8	93.0	97.2	99.1	99.6
Other transactions	1.8	2.1	2.0	1.2	2.3
Total	254.0	274.1	307.7	276.0	239.5

Note: The transactions are stated as debits to current accounts at Danmarks Nationalbank. Transfers to other payment and settlement systems thus exclude automatic collateralisation drawings where separate accounts are debited.
Source: Danmarks Nationalbank.

SETTLEMENT OF CUSTOMER PAYMENTS IN KRONOS Box 11

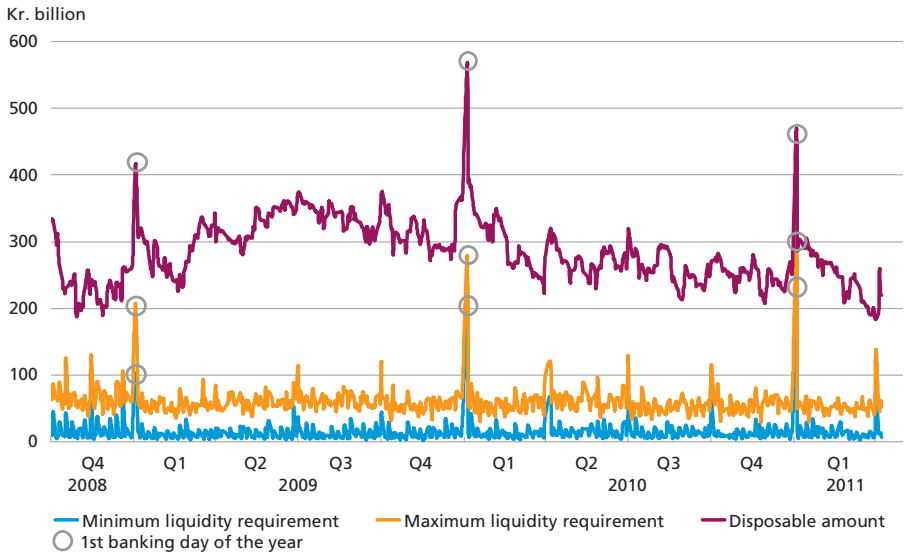
Kronos participants primarily comprise banking institutions and mortgage-credit institutes. In addition to settling their own payments, participants in Kronos can also settle payments on behalf of their customers. Thus, the customers' payments can be settled with same-day value, as payments in Kronos are settled immediately after dispatch. The value date of a retail payment submitted for settlement in the Sum-clearing, however, will be the following banking day at the earliest. Payments remitted late in the evening will be received two banking days later, and for those remitted during weekends the time to settlement can be even longer.

The Danish banking institutions have a mutual agreement that customer payments above kr. 5 million should have same-day value. This will be the case for payment settlement in Kronos.

There is no lower limit to the size of a payment that can be settled in Kronos. In Kronos, all payments are settled with same-day value, regardless of size. The average cost of settling a payment in Kronos was just over kr. 7 in 2009, cf. Box 12. This amount does not include the banks' own costs of using Kronos. Kronos should be used more for settling time-critical customer payments than it is today, also regarding amounts below kr. 5 million.

the extent possible, the mortgage-credit institutes seek to spread out the auctions on the first banking day in each quarter, cf. chapter 2. This is beginning to be reflected in lower liquidity requirements around the turn of

LIQUIDITY REQUIREMENT OF KRONOS PARTICIPANTS Chart 53



Note: The disposable amount is the participants' total credit line plus their current-account balance when Kronos opened (7:00 a.m.). The maximum liquidity requirement corresponds to the liquidity needed by the participants for settling all payments over the day without delay. The amount depends on the order in which payments were settled during the day. The minimum liquidity requirement corresponds to the liquidity needed by the participants for settling all payments over the day with maximum netting of incoming and outgoing payments.

Source: Danmarks Nationalbank.

COST COVERAGE IN KRONOS Box 12

According to Danmarks Nationalbank's pricing policy for Kronos, external costs are invoiced directly to participants, while internal costs are paid by Danmarks Nationalbank. External costs are costs for Bankernes EDB Central (BEC), which is in charge of the technical operation of Kronos. Internal costs constitute a share of Danmarks Nationalbank's costs for e.g. staff and IT relating to the operation of Kronos. In 2010, Danmarks Nationalbank analysed the cost coverage in Kronos based on a method developed by the ECB. The analysis showed that Kronos had a cost coverage of 58 per cent in 2009. Thus, Danmarks Nationalbank paid the remaining 42 per cent of costs for Kronos. In 2009, the average cost per payment was just over kr. 12, of which the participants paid approximately kr. 7. This amount does not include the participants' own costs for using Kronos.

The main rationale for letting Danmarks Nationalbank cover part of the costs of Kronos is that there is a public good factor related to operating an RTGS system. It is an advantage for financial stability to have a safe and well-functioning RTGS system that banks and others often use for handling payments. If the price of using the system is too high, it could limit the use of the RTGS system and cause payments to bypass it, resulting in higher risk. Partial cost coverage is often used in small countries' RTGS systems, which have a smaller basis for payments and therefore find it more difficult to cover costs than large countries with more payments. However, there is also a public-good factor in the trans-European RTGS system for euro-denominated payments, Target2.

Central banks use different models for how and the extent to which their costs for operating their RTGS systems are covered. A large number of RTGS systems receive full cost coverage. According to the World Bank's survey of 98 RTGS systems[1], there are approximately as many RTGS systems that receive full cost coverage, as there are systems for which the central bank covers part of the costs.

Like many other central banks, Danmarks Nationalbank charges both a monthly subscription fee and a fee per transaction from the participants. Kronos has a declining fee structure, according to which the participants pay between kr. 1.00 and kr. 0.10 per transaction depending on the monthly number of transactions. In other systems, the price per transaction depends on the time of day when the transaction takes place, so as to encourage participants to execute payments early in the day. Norges Bank does not charge a fee per transaction, so there is no incentive to limit the use of the system, once participants have signed up. However, Norges Bank charges an administration fee for exchanging securities in the participants' collateral deposits and for handling applications for approval of new securities in the collateral base.

[1] World Bank Group, 2008, Payments Systems Worldwide: A Snapshot (Outcome of the Global Payments Systems Survey 2008).

the year, but it results in an increase in the participants' liquidity requirements at the beginning of the other quarters of the year.

Kronos had a satisfactory degree of operational stability in 2010. However, due to an incident on 8 March 2010 relating to a software error, settlement of payments stopped immediately after the opening of the system at 7:00 a.m. The reason was that a payment was sent to an insolvent participant, whose account had been blocked. Therefore, the

payment could not be settled, but instead of being removed by the system, the erroneous payment blocked other payments. Among other things, this caused problems with time-critical payments to CLS and SCP, which had to be settled according to emergency procedures.

The software error was corrected immediately, and in order to be able to prevent other failures of this type, the handling of insolvent banks in Kronos was reviewed in connection with the preparation of a brochure for winding-up of non-performing banks, cf. later in this chapter.

An analysis of Danmarks Nationalbank's total costs of operating Kronos shows that Danmarks Nationalbank covers just under half of the costs, while the rest are paid by Kronos participants, cf. Box 12.

TARGET2

Denmark participates in the trans-European system for settlement of time-critical payments in euro, Target2, because substantial euro-denominated payments are executed via Danish credit institutions. In 2010, Danish daily average Target2 payments totalled kr. 98 billion compared with kr. 110 billion in 2009.

Target2 has a very high degree of operational stability. There were no significant system incidents in 2010, and the accessibility of the system was 100 per cent as in 2009.

From May 2011, it will be possible for Danish participants to join Target2 via the Internet. The access to Target2 via the Internet has limited functionality relative to the existing SWIFT-based access to Target2 and can be used e.g. by small banks without SWIFT access.

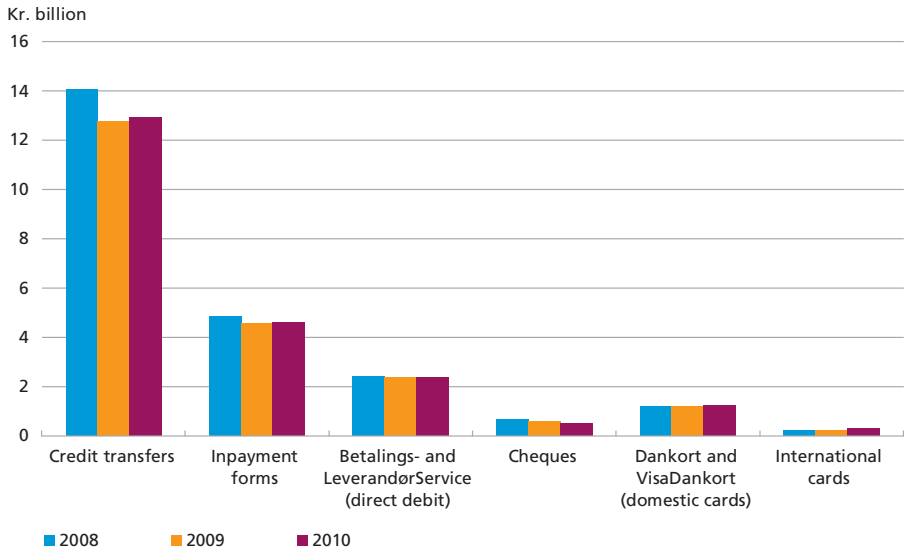
RETAIL PAYMENTS

The retail payments of consumers and enterprises are settled in the Sumclearing, operated by Nets (previously PBS). In 2010, the value of the retail payments in the Sumclearing was largely unchanged on 2009, cf. Chart 54. However, the trend is towards declining use of cheques and rising use of international cards.

Sumclearing operations

Settlement of net positions in the Sumclearing takes place via the participants' settlement accounts with Danmarks Nationalbank in one settlement cycle during the night. The banking institutions need to reserve liquidity for settlement in advance. If the banking institutions do not have sufficient funds in their settlement accounts when settlement is effected, they are postponed. In 2010, there were seven postponements in total.

SUMS SETTLED IN THE SUMCLEARING, DAILY AVERAGES Chart 54



Source: Danish Bankers Association.

During the night before 1 April 2010, a failure occurred on Nets' card platform, which resulted in periodic rejections of card transactions until 2:30 p.m. when operation was back to normal. On Saturday 23 October 2010, online transactions with the Dankort debit card could not be executed in a 2-hour period during the busiest hours of the shops due to technical problems at Nets. Nets has implemented a correction in the system to prevent similar incidents in the future.

Restructuring of Betalingsservice and LeverandørService

Based on a requirement from Danmarks Nationalbank, Betalingsservice (direct debit) and LeverandørService (supplier service) have been restructured as from 10 February 2011, so that the date of book entry will be identical to the settlement date in future. Previously, the process did not comply with international standards for systemically important payment systems, as payments were booked in customer accounts with the banking institutions one day before the exchange of amounts at Danmarks Nationalbank. This meant that already booked, but unsettled, transactions had to be reversed in connection with a participant's suspension of payments or compulsory liquidation. After the restructuring, Betalingsservice and LeverandørService are settled in the same way as other retail payments in the Sumclearing.

Automatic card payment

Automatic card payment is a type of subscription for debit cards, according to which the creditor can make repeated withdrawals from a customer's debit card. Thus, the payments are initiated by the creditor. Some enterprises have begun to use automatic card payment as an alternative to Betalingsservice, as the fee is usually lower than the fee for Betalingsservice, which is almost kr. 5 per transaction.

Automatic card payment possesses a number of the same characteristics as Betalingsservice and should therefore be seen as a competing product. One significant difference, however, is that the customer does not have the same access to easily reverse a payment after the payment has been executed as is the case with Betalingsservice. Furthermore, Betalingsservice makes it easier for the customers to change their bank as the agreements are handled automatically. In automatic card payment, the customer will have to enter new card details when e.g. acquiring a new debit card and every time the card expires. Moreover, the payer does not receive a statement of payments as is the case for Betalingsservice. The use of automatic card payment is an example of customers choosing a cheaper payment instrument with fewer services due to the pricing.

Working group on domestic payment transfers

Danmarks Nationalbank has chaired a working group comprising a wide range of stakeholders in the payments infrastructure. The working group has prepared a report on national payment transfers. The report from January 2010 recommends that the Danish Bankers Association, Nets and Danmarks Nationalbank prepare a final basis for decision on whether to introduce shorter settlement times in Denmark for all retail payments completed during the weekend, for payments executed via online banking in the evening and whether to enable intraday credit transfers. According to the working group's assessment, these initiatives would meet a number of the stakeholders' needs and could probably be implemented without the costs running too high. This basis for decision was presented in April 2011. The Danish Bankers Association found that the costs of introducing shorter settlement times would not justify the advantages for consumers and enterprises.

It is important to Danmarks Nationalbank that the Danish payments infrastructure is safe and efficient and that it continuously supports user needs. Danmarks Nationalbank does not find that the current settlement times in the retail payment infrastructure meet the requirements of today's consumers and enterprises of fast and efficient transfer of payments. It is therefore essential that the infrastructure is developed on an ongoing basis to support new payment instruments, such as mobile pay-

ments, as there will otherwise be a risk that settlement will be effected via less safe solutions. In Danmarks Nationalbank's view, significantly shorter settlement times are needed to support future payment instruments.

Consequently, Danmarks Nationalbank has informed the minister for economic and business affairs that it is necessary to consider other models than those recommended in the working group's report. Against this background, Danmarks Nationalbank does not consider the work for which the working group on domestic payment transfers was set up to have been completed, and the work will therefore continue in 2011. The working group is expected to present its basis for decision by the end of the year.

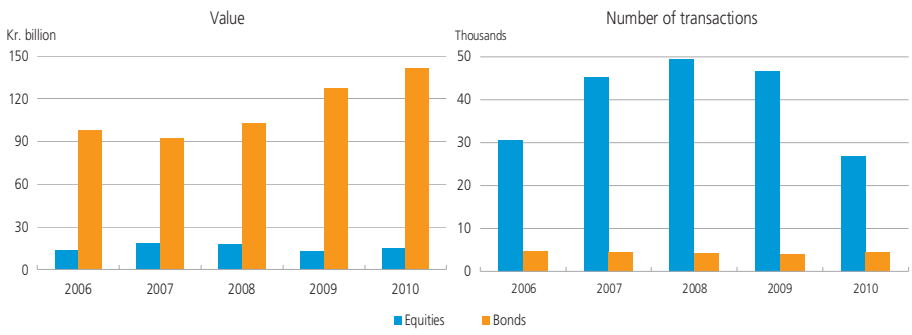
A national payments council in which a wide range of stakeholders can discuss developments within the area is another option, but right now Danmarks Nationalbank's focus is on the working group on domestic payment transfers.

SEPA

The European banks have launched two SEPA products that banking customers in Europe can use for national and cross-border payments as well as credit transfers: SEPA Credit Transfer, which is used for credit transfers, and SEPA Direct Debit, which resembles the Danish Betalingsservice system.

With a view to promoting the transition to the SEPA products, the European Commission has tabled a proposal for a regulation, under which credit transfers and direct debits denominated in euro must meet the technical requirements characterising the SEPA products as from a specified date. The proposal, which is being read at the Council and the European Parliament, will also apply to non-euro area member states, albeit subject to a longer transitional period. Over time, this will also have

EQUITIES AND BONDS SETTLED IN THE VP SETTLEMENT, DAILY AVERAGE Chart 55



Source: VP Securities.

consequences for Danish banking institutions, which will have to restructure euro-denominated credit transfers settled in the Sumclearing to comply with the requirements.

SECURITIES SETTLEMENT

The value of transactions settled in VP settlement continued to rise in 2010, cf. Chart 55. By contrast, the number of transactions settled declined. This was due to the introduction of a central counterparty in the equity market in the autumn of 2009.

Central counterparties

A central counterparty steps in as buyer for the seller and as seller for the buyer in a securities transaction. If one of the counterparties defaults, the central counterparty guarantees payment for or delivery of securities. A central counterparty performs netting, implying that several transactions are bundled before they are settled. The Dutch company, EMCF, functions as a central counterparty in the market for Danish large cap equities.[1]

In 2011, two central counterparties, Swiss SIX x-clear and UK EuroCCP, also plan to enter the Danish market. They had originally planned to offer clearing of Danish equities already from 2010, but still need to fulfil certain regulatory requirements.

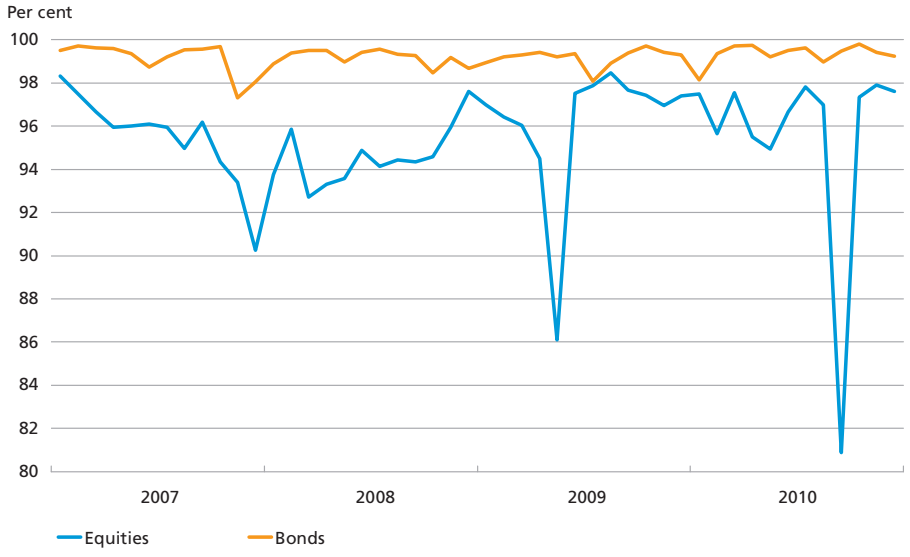
Focus on settlement stability

VP settlement has generally proceeded according to plan in 2010. However, there were a few delays in settlement during the summer, and on 19 August a serious incident occurred, cf. below. The settlement rate, i.e. the rate of trades settled on time, exceeded 99 per cent for bonds, while the settlement rate for equities was slightly lower, cf. Chart 56. This was due to the transition to settlement via the central counterparty.

The settlement rate is monitored because the replacement risk increases if a securities transaction is not executed on time. Replacement risk is the risk of incurring a loss if the counterparty fails between the time of conclusion of a securities transaction and the settlement so that the transaction cannot be executed. The buyer will forego a potential capital gain if the market price of the securities has risen since the trade was concluded, and the seller will incur a loss if the market price has declined. Moreover, if a securities transaction is not settled on time, a liquidity risk could arise if the seller has to raise new liquidity at short notice, or if the

[1] The introduction of clearing through a central counterparty in the Danish market is described in Søren Korsgaard and Peter Restelli-Nielsen, Clearing via central counterparties in Denmark, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2010.

SETTLEMENT RATES FOR SECURITIES TRANSACTIONS IN VP SETTLEMENT Chart 56



Note: The low settlement rate for equities in September 2010 was due to irregularities in connection with an increase of a company's share capital. Several investors tried to trade equities with a wrong ISIN, so these transactions could not be settled.
Source: VP Securities.

buyer has to borrow similar securities in the market to honour a resale with the same-day value.

The introduction of a central counterparty in the Danish equity market led to several incidents, particularly in the 1st half of 2010, with the central counterparty not having reserved sufficient liquidity to be able to settle its transactions. Such an incident occurred on 19 August. Consequently, one of VP's trading blocks could not be settled. When VP tried to solve the problem, a technical error in VP's systems caused payment for securities, which – at first – were not received.

Several measures have therefore been introduced to avoid similar problems in future. The technical error was corrected immediately, and the central counterparty has subsequently begun to reserve more liquidity for settlement. In addition, Danmarks Nationalbank has participated in a working group, which has, among other things, analysed the possibility of increasing the incentive to timely settlement. This is expected to result in a new incentive structure for timely VP settlement in 2011. Moreover, the working group's work is expected to result in the introduction of a new sanction system for overdrafts at VP.

VP settlement is based on a number of settlement blocks distributed over the day and night. Securities transactions are typically settled during the night, while e.g. interest and dividends are paid in the morning.

DELAYS IN DAY-TIME SETTLEMENT IN DANISH KRONER Table 5

Number of days	2006	2007	2008	2009	2010
VP33 (PvP)	0	2	6	5	5
VP35 (Periodic payments)	3	1	3	4	5
VP40 (Trading settlement)	0	0	0	2	1
VP60 (Trading settlement)	1	1	0	0	0
Total delays	4	4	9	11	11

Note: Categorisation is base don the number of days when entry of the net settlement amounts to the participants' settlement accounts at Danmarks Nationalbank took place later than 30 minutes after the deadline for receipt of book entries from VP Securities.
Source: Danmarks Nationalbank.

As previous years, 2010 saw minor delays in the exchange of kroner versus euro in the VP33 settlement block and in the settlement of interest and dividend payments in the VP35 settlement block, cf. Table 5. The delays typically occur because these settlement blocks basically have to be executed in their entirety unlike trading blocks, for which only the amount covered on the cash and securities legs is settled. A single participant's inadequate reservation of liquidity will therefore delay the entire block.

Danmarks Nationalbank has previously encouraged market participants to analyse the consequences of postponing the time of settlement for VP33, which would give the participants more time for raising euro liquidity. It is currently considered most reasonable to await implementation of Target2-Securities. The delays in VP35 have been addressed by making it possible to remove individual securities from the settlement, allowing VP35 to be settled without significant delays.

Regulatory initiatives

In September 2010, the European Commission proposed a regulation on central counterparties, the European Market Infrastructure Regulation, EMIR[1]. One of the implications of the regulation is that most derivatives trades will, in future, be cleared via central counterparties. This also means that risks are concentrated on the central counterparties. Therefore, EMIR also includes a number of requirements on the risk management of central counterparties. EMIR is expected to be adopted in 2011.

Under the auspices of the European Commission, two other initiatives concerning securities settlement are underway. One of them is a directive, the Securities Law Directive, addressing the legal barriers of cross-border securities settlement. The European Commission has held two consult-

[1] EMIR and the role of central counterparties in the derivatives markets are described in Søren Korsgaard, Central counterparties in the derivatives markets, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2010.

ations, but a final proposal has not yet been presented. The other initiative is a consultation on trans-European rules on central securities depositories, which was opened in January 2011. This consultation suggests trans-European regulation of both central securities depositories as institutions and harmonisation of settlement practice.

CLS

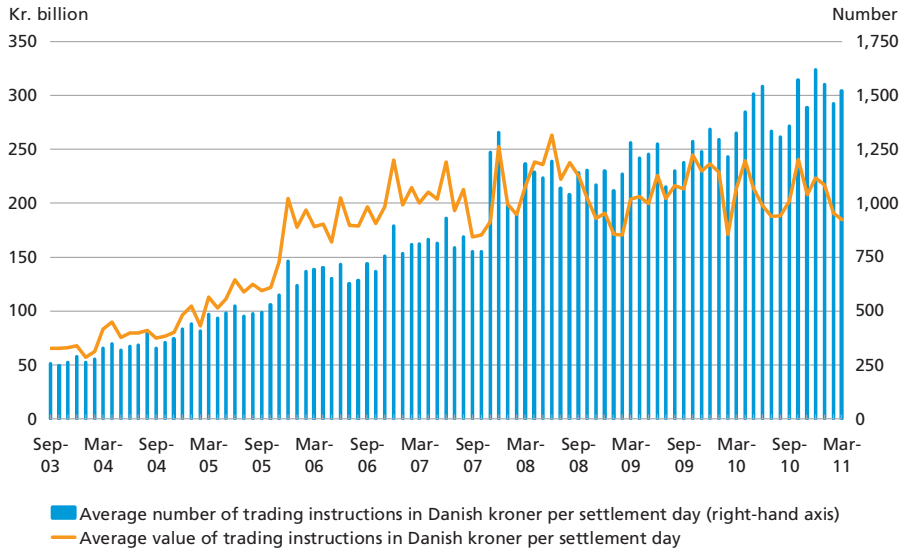
The international currency settlement system, CLS, contributes to financial stability by reducing settlement risk in the foreign-exchange market. In practice, CLS eliminates the credit risk on a foreign-exchange transaction via simultaneous settlement of the two legs, i.e. Payment versus Payment, PvP.

Settlement of CLS payments in Danish kroner takes place via accounts with Danmarks Nationalbank through Kronos. There are four direct participants in Danish kroner: Danske Bank, Nordea, SEB and DnB Nor Bank. The other CLS participants can settle Danish kroner through an agreement with one of the four direct participants for Danish kroner.

CLS operation in 2010

The number of foreign-exchange transactions settled in CLS has been rising every year since CLS went live in 2002, and 2010 was no exception. This trend is seen in both overall CLS settlement in all currencies and

NUMBER AND VALUE OF FX TRANSACTIONS IN DANISH KRONER SETTLED IN CLS Chart 57



Note: The Danish krone joined CLS on 8 September 2003.
Source: CLS Bank.

settlement in Danish kroner, cf. Chart 57. The average daily value of settled transactions, however, has been declining during the financial crisis. The average daily value of settlement in Danish kroner totalled kr. 209 billion in 2010, largely unchanged on 2009.

Thus, large gross amounts in Danish kroner are settled on a daily basis in CLS, especially considering the size of Denmark. According to a BIS survey, Danish CLS participants settle about 80 per cent of their foreign-exchange transactions in CLS. The remaining 20 per cent, which is settled via other settlement methods, is primarily transactions in currencies or with counterparties that are not in CLS, or types of trades, e.g. trades for same-day settlement, which cannot be settled via CLS.[1] In addition to Danish banks, several Danish enterprises participate as indirect participants in CLS, including Carlsberg, Dansk Supermarked, ISS and TDC.

CLS has generally exhibited a very high degree of operational security. In early May 2010 when the number of trades hit an all-time high as a consequence of turbulence in the foreign-exchange market, some capacity problems did arise, though. At times there were minor delays in the handling of trades in the CLS system. However, all trades were settled on the value date. CLS has subsequently focused on increasing its capacity.

The Japanese yen is one of 17 currencies settled in CLS. Settlement went according to plan during the natural disaster in Japan in March 2011, but the situation was monitored closely.

Danmarks Nationalbank applies a payment simulator, developed by the Finnish central bank, in its ongoing oversight of the Danish payment infrastructure. The payment simulator is based on actual payment data, so it imitates the Danish payments infrastructure. By means of the payment simulator, Danmarks Nationalbank has analysed the consequences of a CLS failure for the rest of the payment settlement in Danish kroner in Kronos, cf. Box 13. The analysis suggested that the consequences are very limited due to the ample liquidity among Kronos participants, particularly in the form of bonds, which can be provided as collateral for intraday loans from Danmarks Nationalbank.

EXPERIENCE FROM SETTLEMENT SYSTEMS REGARDING BANK RESCUE PACKAGE 3

Together with VP and Nets, Danmarks Nationalbank has prepared the implementation of the winding-up scheme for banks, Bank Rescue Package 3,

[1] Cf. Natorp, Lone and Tina Skotte Sørensen, Settlement of foreign-exchange transactions, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2006.

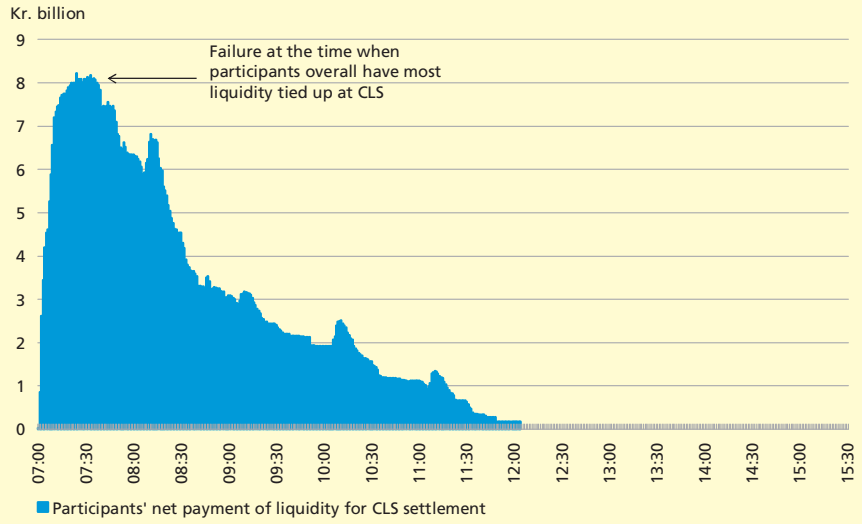
SIMULATION ANALYSIS OF THE CONSEQUENCES OF CLS FAILURE – TO BE CONTINUED Box 13

When foreign-exchange transactions are settled via CLS rather than correspondent banks, the operational risk is concentrated on CLS, and the risk increases that settlement problems via CLS spread to the RTGS systems. In the light of this, Danmarks Nationalbank has analysed the consequences of a CLS failure for payment settlement overall in Danish kroner in Kronos. The analysis shows that – given the participants' ample liquidity, cf. the Chart – a CLS failure is unlikely to have implications for the settlement of other payments in Danish kroner.

The analysis was carried out by setting up and comparing two scenarios:

- A baseline scenario, in which all payments are settled normally.
- A failure scenario, in which a fictitious failure is simulated, halting all payments to and from CLS. The failure occurs at the, liquidity-wise, worst possible time when CLS participants have the most liquidity tied up at CLS, cf. the Chart.

CLS PARTICIPANTS' AVERAGE NET PAYMENT TO CLS



The two scenarios were repeated for 70 days in the period 2008-2010 when daily payments for CLS settlement exceeded kr. 10 billion. During the 70 days covered by the simulation, 200,000 payments were executed in Kronos. Of these, only seven payments, which did not concern CLS, were delayed due to incidents of failure.

Ample liquidity of the participants is a key precondition for a CLS failure having few consequences for the settlement of payments in Kronos. Calculations in the payment simulator shows that a failure in CLS will have more consequences in the form of more delayed payments if the participants' liquidity is reduced to 75 per cent and 50 per cent, respectively, of the actual level, cf. the Table. Settlement of payments in Kronos remains relatively resilient to CLS failure, though, as only 1 per cent of the payments (in value terms) is delayed by a CLS failure, even if the participants' liquidity is halved.

SIMULATION ANALYSIS OF THE CONSEQUENCES OF CLS FAILURE – CONTINUED Box 13

If a specific system failure occurs, CLS also has emergency procedures in place that can, in practice, be used to execute payments while the system is down.

DELAYED NON-CLS PAYMENTS AS A CONSEQUENCE OF CLS FAILURE, DAILY AVERAGE

Liquidity	Number	Value, kr. million	Per cent of total payments in value terms
100 per cent	0.1	10	0.16
75 per cent	0.7	500	0.32
50 per cent	20.3	1,679	1.09

Note: In these calculations, all Kronos participants' liquidity is reduced by one fourth and half of the liquidity that had actually been available to the participants. Then the baseline scenario and the failure scenario are compared for each liquidity level.

in relation to the payment and settlement systems. The intention of Bank Rescue Package 3 is that ordinary depositors should not feel any immediate difference in the performance of their everyday banking business, even though their bank has been taken over by the Financial Stability Company, cf Appendix 1. Winding-up of a banking institution under Bank Rescue Package 3 is handled in payment and settlement systems by the new institution taking over the previous institution's accounts at Danmarks Nationalbank on unchanged conditions.

The scheme was first used when Amagerbanken failed in early February 2011. The transfer of Amagerbanken's assets to the newly established subsidiary of the Financial Stability Company proceeded smoothly in domestic payment and settlement systems.

In line with domestic counterparties, foreign counterparties can make payments to a bank being wound up without risking that the money ends up in the insolvent estate. However, in the case of Amagerbanken, the banks' foreign counterparties were uncertain about the situation and hesitated to effect payments to the newly established subsidiary of the Financial Stability Company. Therefore, the new bank was, in practice, prevented from executing other payments than purely domestic payments. Danmarks Nationalbank has raised this issue in the relevant international forums.

Special-Topic Section

6. Basel III and Danish Credit Institutions

Basel III imposes stronger capital and liquidity requirements on credit institutions. In the capital area, the requirements in terms of both the quality and quantity of the institutions' capital will be strengthened, and new buffer requirements will be introduced. An analysis of the capitalisation of Danish credit institutions shows that they would have had to raise new capital of a better quality totalling some kr. 13 billion if these requirements had applied in 2010 in order to meet individual capital needs. If they had also had to fulfil capital conservation buffer requirement of 2.5 per cent of the risk-weighted items, they would have needed to raise capital for a further kr. 15 billion.

In the liquidity area, two new international liquidity requirements will be introduced. One requirement aims to ensure sufficiently large liquidity buffers in the short term, while the other relates to sufficient stable funding. The need for adjustments will depend on the balance-sheet composition of the individual institution, as well as the liquidity risks taken on. As a consequence of the new requirements, the individual banking institution may need to achieve better balance between deposits and lending or to obtain longer maturities for its market-based funding.

For the mortgage-credit institutes, adjustable-rate loans, i.e. long-term loans funded by way of short-term bonds, represent a particular challenge. The new rules on stable funding target this very type of refinancing risk. Already at this point, the mortgage-credit institutes should seek inspiration in the new requirements and move towards more stable funding.

The capital requirements have practically been finalised and will be phased in gradually from 2013. The liquidity requirements have not been finalised and will be implemented from 2015 and 2018, respectively, following an observation period. The transitional period will give the institutions time to make the necessary adjustments, but they should already now plan how to do so.

BACKGROUND AND METHOD

In December 2010, the Basel Committee on Banking Supervision[1] published the new international regulatory framework for credit institutions, Basel III, containing stronger capital and liquidity requirements. Basel III is

[1] The Basel Committee has 27 members. Denmark is not a member.

not immediately binding on Danish credit institutions, but will be implemented – after more or less adjustment – via EU legislation. In 2011, the European Commission is expected to present a proposal for amendments to the EU capital adequacy framework in the areas covered by Basel III.

Before the publication of Basel III, a quantitative assessment of the impact of the new rules on the capital and liquidity of the credit institutions (Quantitative Impact Study, QIS) has been performed both within the Basel Committee and the EU.[1] Four Danish credit institutions participated in the QIS. The results of the QIS showed that the liquidity requirements will have a substantial impact on the Danish credit institutions. The institutions will also be affected by the stronger capital requirements, but to a lesser extent.

This Chapter emphasises the key elements of the new regulatory framework in relation to the capital and liquidity structures of banking institutions and mortgage-credit institutes. Furthermore, it is assessed how and to which extent the future capital and liquidity requirements will affect the sector.

The impact of the new capital requirements is illustrated by an analysis of whether the credit institutions' could have fulfilled the requirements, if these have been in force in 2010. The method reflects the fact that some of the information required is not available to the public. Nevertheless, the results give a good indication of the impact of the new capital requirements on the institutions.

Since the information in the public domain is insufficient to quantify the impact of the new liquidity requirements on the credit institutions, the new requirements and their consequences for the balance-sheet composition and funding structure of a credit institution are illustrated by simple examples for both banking institutions and mortgage-credit institutes.

The analysis is based on the Basel Committee proposals of December 2010. In the capital area, the new requirements had practically been finalised by December 2010, whereas the new liquidity requirements will be finalised only after an observation period. During this period, the requirements may be adjusted, so the final requirements may deviate from the current proposal.

THE NEW CAPITAL REQUIREMENTS

The new Basel III capital requirements comprise stronger minimum capital requirements, as well as requirements for strengthening the quality of the credit institutions' capital. In addition, new capital buffers requirements are introduced, cf. Box 14.

[1] See also Borka Babic: Status on Basel III – liquidity and capital, *Monetary Review*, 1st Quarter 2011.

THE NEW CAPITAL REQUIREMENTS – TO BE CONTINUED Box 14

Basel III lays down minimum requirements for three categories of capital: Common Equity Tier 1, Tier 1 and total capital. The total capital of the credit institutions must be at least 8 per cent of risk-weighted assets, i.e. unchanged from the existing rules. The requirements for Common Equity Tier 1 capital and Tier 1 capital are raised from 2 per cent to 4.5 per cent and from 4 per cent to 6 per cent, respectively. The existing rules to the effect that Tier 2 may not exceed half of the capital base and that hybrid capital may not exceed half of Tier 1 will be revoked.

The Basel Committee has set out a number of criteria for each capital category. Common Equity Tier 1 is capital of the highest quality. In principle, the Common Equity Tier 1 of joint stock companies will comprise common shares and reserves. Non-joint stock companies may use other types of capital which meet the same criteria. It will be possible for supervisory authorities to take into account the specific constitution and legal structure of the enterprise when assessing the capital quality.

It should be possible to write down all Additional Tier 1 capital or convert it into share capital at a pre-specified trigger point. Additional Tier 1 must be perpetual and free of incentives to redeem (e.g. interest step-ups). Moreover, it the issuer must have full discretion at all times to cancel distributions/payments. Nor must there be any incentives to redeem Tier 2. In addition, Tier 2 must have a minimum original maturity of at least 5 years, and inclusion of Tier 2 in the capital base of the credit institution during the last five years before maturity will be reduced gradually. It must be possible to write down this type of capital as well and/or convert it into share capital if the credit institution is failing and cannot survive on market terms.

A number of regulatory adjustments (deductions and prudential filters) are applied to the capital of the credit institutions. Among these are deferred tax assets and goodwill, which generally have a small or non-existing value when the institution performs poorly, so they cannot be expected to absorb losses. Deductions of investment in other financial institutions are made to avoid including the same capital in several financial corporations.

Basel III harmonises regulatory adjustments. The adjustments applicable under Basel III are generally already being applied in Denmark. Under the new rules deductions and filters are generally applied at the level of Common Equity Tier 1, while several of these are applied to Tier 1 and total capital under the existing rules. However, it is possible to make deductions for investments in other financial corporations in all three capital categories, depending on which criteria the invested capital meets. Deduction for invested capital can be made in Common Equity Tier 1 only if the invested capital meets the criteria for this category.

Besides the minimum requirements Basel III lays down two buffer requirements:

- a capital conservation buffer and
- a countercyclical capital buffer.[1]

The capital conservation buffer must be equivalent to up to 2.5 per cent of risk-weighted assets. In addition, a countercyclical buffer of up to 2.5 per cent must be held in periods when systemic risk is building up, e.g. when lending growth is high. Restrictions on distribution of dividend, share buy-backs or bonus payments apply in the event of non-compliance with the buffer requirement. The capital conservation

THE NEW CAPITAL REQUIREMENTS – CONTINUED Box 14

buffer and the countercyclical buffer must be complied with by way of Common Equity Tier 1.[1] Basically, the buffers are to be added to the individual capital need. If the calculation of the individual capital need already takes account of the systemic risks that are to be covered by the buffer requirement, adjustment may be necessary.

The Basel Committee envisages implementation of the rules over a prolonged period. The new requirements of Tier 1 should be phased in gradually from 1 January 2013 and be fully phased in by 2015, and the buffer requirements are to be phased in from 2016 to 2018. The deduction rules are to be phased in over the period 2014-18. Instruments that do not meet the criteria are to be phased out gradually over a 10-year period starting in 2013. If there are incentives to redeem capital, and that capital does not meet one or more of the other criteria, it will not be eligible for inclusion after the effective maturity date (interest-rate step-up date). Government capital injections that do not meet the criteria, e.g. the Danish capital injections under Bank Rescue Package 2, will be eligible for inclusion until January 2018.

[1] See also Mads Peter Pilkjær Harmsen: Basel III: Macroprudential regulation by means of countercyclical capital buffers, Monetary Review, 4th Quarter 2010.

The results of the QIS for capital show that the Danish credit institutions that participated in the study will be affected by the new requirements. They will be affected particularly by the stricter criteria for Additional Tier 1 and Tier 2. However, the capital ratios of the Danish credit institutions, calculated under the new rules, are higher than the averages for the institutes in the countries that are members of the Basel Committee, and of the EU institutions.

This section analyses a larger population of approximately 100 credit institutions.[1] The calculations are based on financial statements for 2010 and do not take into account the transitional arrangements. In other words, it is assumed that the rules had been fully implemented in 2010. The impacts of the stricter requirements of capital quality as well as the new minimum percentage requirements are assessed for Common Equity Tier 1, total Tier 1 and total capital. The effect of introducing a capital conservation buffer is also assessed.

A number of factors have not been taken into account in the calculations below. Firstly, it is not taken into account that the calculation of risk-weighted items will change as a result of more stringent requirements relating to e.g. the credit institutions' trading book exposures, securitisation and counterparty credit risk. Changes to these rules may affect large institutions, but they are assessed to have a very limited impact on most institutions. Secondly, the assessments do not take into account that the new rules provide for introducing a countercyclical capital buffer as this buffer would presumably not have been introduced in the current

[1] The calculations are institution-based, but the capital requirements must also be met at group level. The capital requirement for the group may be higher than that applying to the institution, cf. Chapter 1.

economic environment. In the event of a marked recovery in the sector and the economy, it will be necessary to build up this buffer. Thirdly, it is not taken into account here that further capital requirements can be expected to be imposed on systemically important institutions, cf. Chapter 7.

Common Equity Tier 1

Common Equity Tier 1 in Danish credit institutions that are limited liability companies consists of common shares and reserves, including retained earnings. Since this type of capital meets the Basel III criteria, these companies will not be affected by the strengthening of the criteria for Common Equity Tier 1.

According to Basel III, the same criteria are to be applied to other types of companies, e.g. savings banks and cooperative banks. Guarantee capital in savings banks and cooperative capital in cooperative banks will not immediately meet all of the criteria. However, the Basel III proposals enable supervisors to take the special circumstances of these institutions into account when assessing their capital quality. Whether savings banks and cooperative banks will be affected will depend on the implementation of the rules at EU level.[1] In the calculations below it is assumed that the savings banks and cooperative banks can include their guarantee and cooperative capital in their calculation of Common Equity Tier 1.

Basel III will entail amendments to the rules of regulatory adjustments, which means that deductions and prudential filters are generally applied at the level of Common Equity Tier 1, cf. Box 14. Calculation of Common Equity Tier 1 in 2010 under the assumption that all regulatory adjustments had been applied to this type of capital gives an impression of the impacts of Basel III. The calculations show that the average capital reduction for the institutions would constitute 1.3 percentage points, from 16.9 per cent to 15.6 per cent, cf. Chart 58. The reduction is presumably smaller since not all deductions would be made in Common Equity Tier 1.[2]

The strengthening of the Common Equity Tier 1 requirement from 2 per cent to 4.5 per cent and the implementation of the capital conservation buffer will require adjustment for a few smaller credit institutions. However, the requirement has no great impact on the sector as a whole. To observe the new minimum requirement for Common Equity Tier 1 as well as the capital conservation buffer, the sector overall must raise capital in the range of kr. 2.2 billion, corresponding to 0.6 per cent of the sector's total Common Equity Tier 1.

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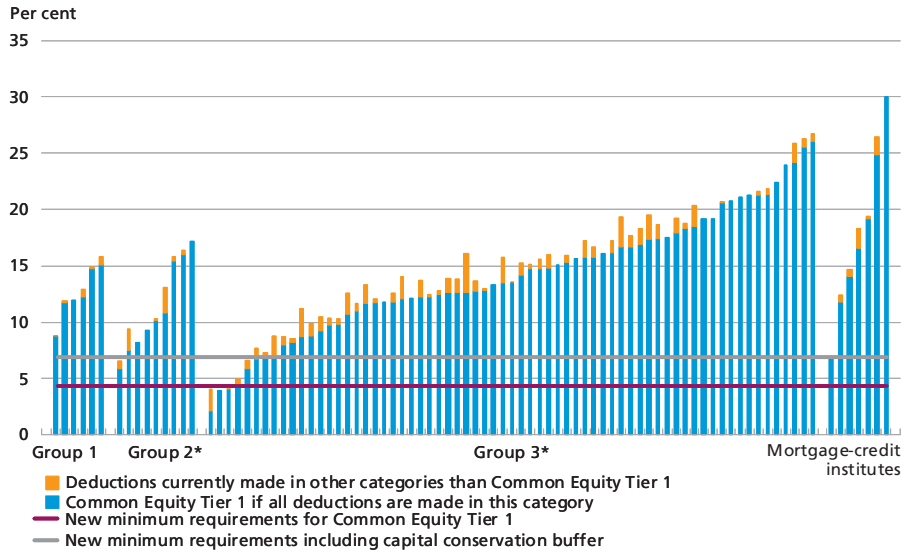
1 The existing EU rules take into account the special circumstances of these institutions. For instance these companies may redeem cooperative and guarantee certificates, subject to the approval of the supervisory authorities.

2 Furthermore, the calculations do not take into account that the Basel Committee allows limited recognition of some regulatory adjustments.

COMMON EQUITY TIER 1 IN 2010 AND THE NEW CAPITAL REQUIREMENTS Chart 58



Note: Eight credit institutions are not shown in the Chart for presentation reasons, but they are included in the calculations in this section. In early 2011, Danske Bank launched a share issue, the proceeds from which (around kr. 20 billion) are included in the capital of the credit institution. Moreover, it has been taken into account that Århus Lokalbank converted 80 per cent of a government capital injection into shares in early 2011. Group 2* is defined as in Chapter 1. Saxo Bank has been included in group 3*.

Source: Danish Financial Supervisory Authority and own calculations.

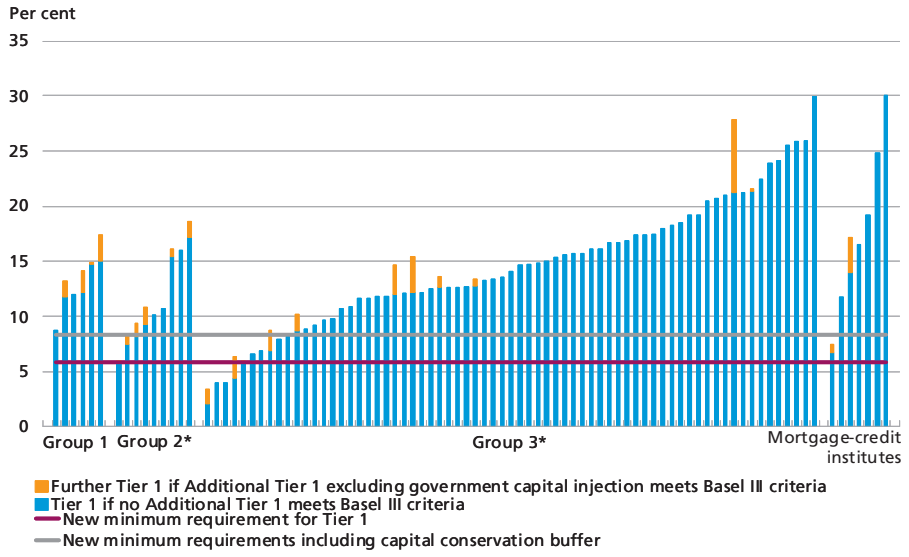
Tier 1

Tier 1 is made up of Common Equity Tier 1 and Additional Tier 1. The criteria for Additional Tier 1 will be strengthened with the introduction of Basel III. It is not possible to assess the exact implications for the individual credit institutions on the basis of the publicly available information on the properties of Additional Tier 1. The current Additional Tier 1 capital usually includes redemption incentives. Due to the transitional rules, this type of capital may be included after the date of an interest-rate or price increase – provided that it meets all other Basel III criteria. It is assessed that only a small part, at best, of the sector's total issuance of Additional Tier 1 instruments will meet this requirement. Moreover, some market pressure may be expected for the institutions to redeem the capital when interest rates or prices go up. The government capital injections constitute Additional Tier 1 and are not expected to meet the new requirements[1] unless they are converted into common shares.

The assessment of the implications of the new rules is based on two separate scenarios:

[1] The conditions for the government capital injections include an economic incentive to replace government capital by private capital. Moreover, government capital injections do not meet the criteria that the bank must have full discretion at all times to cancel distributions/payments.

TIER 1 IN 2010 AND THE NEW CAPITAL REQUIREMENTS Chart 59



Note: Seven credit institutions are not shown in the Chart for presentation reasons, but they are included in the calculations in this section. In early 2011, Danske Bank launched a share issue, the proceeds from which (around kr. 20 billion) are included in the capital of the credit institution. Moreover, it has been taken into account that Århus Lokalbank converted 80 per cent of a government capital injection into shares in early 2011. Group 2* is defined as in Chapter 1. Saxo Bank has been included in group 3*.

Source: Danish Financial Supervisory Authority and own calculations.

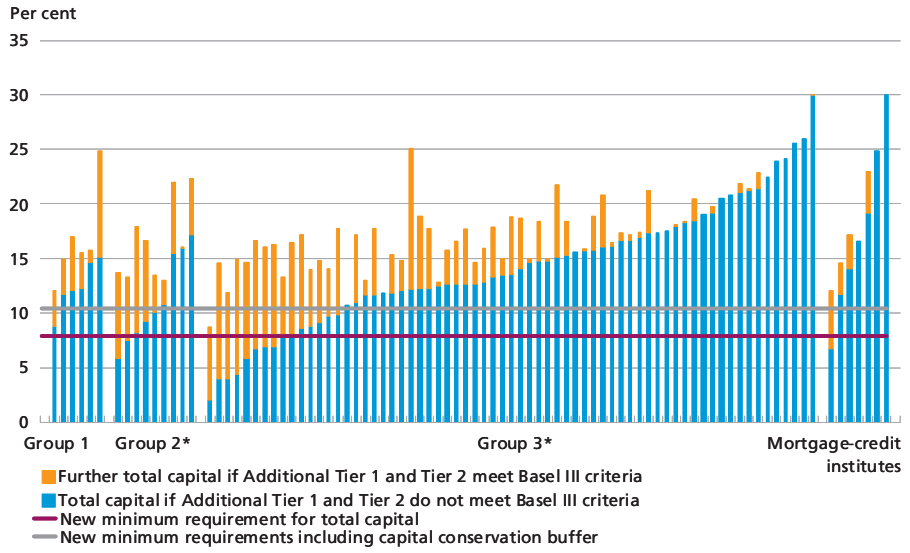
- no Additional Tier 1 meets the new requirements[1], and
- Additional Tier 1 other than government capital injections meets the new requirements.

Assuming that no Additional Tier 1 capital meets the Basel III requirements, seven credit institutions will be unable to meet the 6-per-cent requirement, and a further eight will be unable to meet the 6-percent requirement plus the capital conservation buffer, cf. Chart 59. With a few exceptions, these institutions would not meet the new minimum and buffer requirements even if their Additional Tier 1 excluding government capital injections could be included under the new rules. This reflects that non-government Additional Tier 1 has limited importance for Danish credit institutions. Additional Tier 1 is more prevalent among large and medium-sized institutions than among small institutions.

In order to meet the new minimum requirement for Tier 1 as well as the capital conservation buffer requirement, the sector – assuming that none

[1] The calculations do not take into account the lifting of the existing restrictions on inclusion of Additional Tier 1 in the calculation of Tier 1 under the new requirements. To the extent that an institution has Additional Tier 1 that cannot be included in Tier 1 under the existing rules due to these restrictions, but which meets the future requirements, the implementation of the new rules will have a positive impact on the institution's Tier 1 capital.

TOTAL CAPITAL IN 2010 AND THE NEW CAPITAL REQUIREMENTS Chart 60



Note: Nine credit institutions are not shown in the Chart for presentation reasons, but they are included in the calculations in this section. In early 2011, Danske Bank launched a share issue, the proceeds from which (around kr. 20 billion) are included in the capital of the credit institution. Moreover, it has been taken into account that Århus Lokalbank converted 80 per cent of a government capital injection into shares in early 2011. Group 2* is defined as in Chapter 1. Saxo Bank has been included in group 3*.
Source: Danish Financial Supervisory Authority and own calculations.

of the existing Additional Tier 1 meets the new requirements – must raise approximately kr. 5.4 billion in capital, corresponding to 1.3 per cent of the sector's total Tier 1 capital.

Total capital

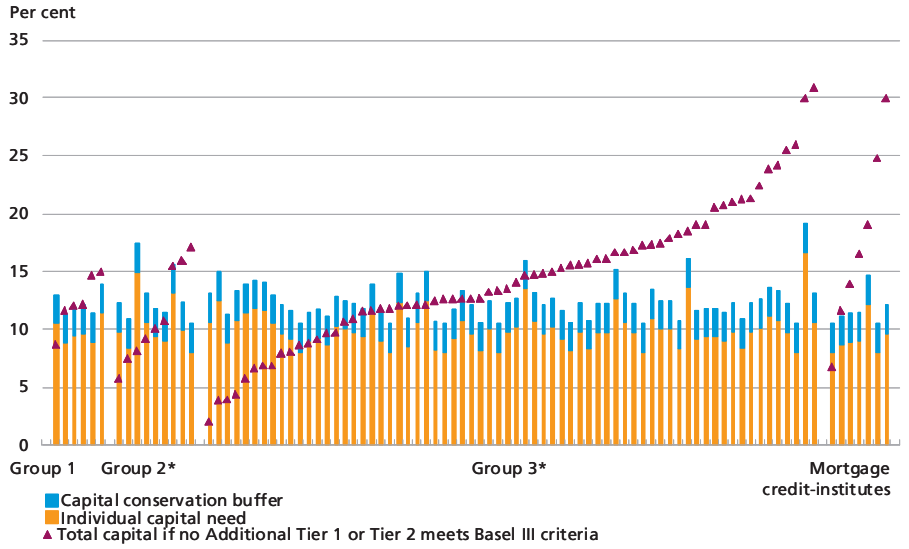
The credit institutions' total capital comprises Tier 1 and Tier 2. The criteria for Tier 2 will be strengthened with the introduction of Basel III.

A large part of the credit institutions' Tier 2 capital includes, like Additional Tier 1, an incentive to redeem. It is not possible to assess exactly whether the credit institutions' Tier 2 capital will meet the other Basel III criteria. The impact of Basel III on the institutions is therefore assessed on the basis of two separate scenarios:

- neither Tier 2 nor Additional Tier 1 meets the new requirements[1]
- both Tier 2 and Additional Tier 1 meet the new requirements.

[1] The calculations do not take into account the lifting of the existing restrictions on inclusion of Tier 2 in the calculation of total capital under the new requirements. To the extent that an institution has Tier 2 that cannot be included in total capital under the existing rules due to these restrictions, but which meets the future requirements, the implementation of the new rules will have a positive impact on the institution's total capital.

INDIVIDUAL CAPITAL NEED AND THE NEW CAPITAL REQUIREMENTS Chart 61



Note: Eight credit institutions are not shown in the Chart for presentation reasons, but they are included in the calculations in this section. In early 2011, Danske Bank launched a share issue, the proceeds from which (around kr. 20 billion) are included in the capital of the credit institution. Moreover, it has been taken into account that Århus Lokalbank converted 80 per cent of a government capital injection into shares in early 2011. Group 2* is defined as in Chapter 1. Saxo Bank has been included in group 3*.
Source: Danish Financial Supervisory Authority and own calculations.

Assuming that neither Tier 2 nor Additional Tier 1 meets the criteria, 13 credit institutions will be unable to meet the 8-per-cent requirement, cf. Chart 60. A larger number of institutions will also find it difficult to meet the requirement of a capital conservation buffer.

In addition to the minimum capital requirements, the institutions must also meet their individual capital needs. The individual capital need was, on average, 2.6 percentage points higher than the 8-per-cent requirement at end-2010. The number of institutions that are unable to meet the Basel III requirements increases to 22, and the need for adjustment increases correspondingly, cf. Chart 61. This also makes it more difficult for the institutions to meet the buffer requirements. Approximately one third of the institutions will not be able to comply with the capital conservation buffer requirement. These are primarily small and medium-sized institutions. Assuming instead that the Tier 2 capital of the credit institutions (as well as non-government Additional Tier 1) meets all of the Basel III criteria, only a few institutions will not be able to meet the forthcoming requirements.

Assuming that neither the existing Additional Tier 1 capital nor the existing Tier 2 meets the new requirements, the institutions would need to raise new capital totalling approximately kr. 13 billion in order to comply with the individual capital need. In order to simultaneously meet the cap-

ital conservation buffer requirement, they would need to raise new capital of a better quality totalling approximately kr. 28 billion. This should be viewed in relation to the total capital of kr. 471 billion at end-2010 for the institutions in the analysis. Looking at only the small and medium-sized banking institutions, their capital-raising need totals kr. 6 billion to meet their individual capital needs and kr. 11 billion to meet the capital conservation requirements as well. At end-2010, the total capital of these institutions was kr. 54 billion.

Need for adjustment to the new capital requirements

The calculations show that – even assuming that no Additional Tier 1 or Tier 2 meets the new, more stringent requirements – the vast majority of institutions will be able to meet the Basel III minimum requirements regarding Common Equity Tier 1 and Tier 1. But around one fifth of the institutions will be unable to meet their individual capital needs under the new rules. Even more institutions will be unable to meet the buffer requirement. In order to meet the requirements, parts of the sector will either have to raise new capital in the market or increase their capital by not paying dividend.

Primarily small and medium-sized institutions will not be able immediately to meet the capital requirements, and consequently the sector's overall need to raise new capital is limited. All the same, requirements from investors, credit rating agencies and customers may prove to be higher than the regulatory requirements. For example, they may require observation of the capital conservation buffer and the highest level of the countercyclical buffer, and perhaps further excess capital. It may also be important to the market that the institutions' capital is not reduced compared with the current level. Furthermore, the need for capital can be expected to rise due to extra capital requirements on systemically important institutions.

Basel III will be implemented over a prolonged period, which will give credit institutions time to make the necessary adjustments. However, the market may put them under pressure to meet the new requirements sooner. Consequently, the institutions should already begin to prepare strategies for how the adjustment will take place.

THE NEW LIQUIDITY REQUIREMENTS

The liquidity risk of credit institutions can be defined as the risk of not meeting payment obligations on time. This risk can be reduced in several ways. A stock of highly liquid assets can be used as a buffer against large and sudden cash outflows. An inappropriate mismatch between the pay-

BASEL III LIQUIDITY REQUIREMENTS – TO BE CONTINUED Box 15

Liquidity Coverage Ratio

The Liquidity Coverage Ratio lays down requirements for the liquidity buffer of the credit institutions. This requirement stipulates the stock of unencumbered high-quality liquid assets that an institution is required to hold in order to handle the net cash outflows in a 30-day scenario with severe liquidity stress, cf. equation 1. The volume of liquid assets to be held by each institution will thus depend on the liquidity risks faced by the institution. Moreover, there is a requirement for some match of currencies between the net outflows and the liquid assets.

$$(1) \qquad \frac{\text{Stock of high-quality liquid assets}}{\text{Total net cash outflows over the next 30 calendar days}} \geq 100 \text{ pct.}$$

The LCR will primarily consist of cash, central-bank reserves and government bonds (Level 1 assets). These assets will be included in the buffer at 100 per cent. Other assets, including covered bonds (Level 2 assets) may account for up to 40 per cent of the liquidity buffer. These assets are subject to a haircut of at least 15 per cent, i.e. only 85 per cent of their value counts in the compilation of the LCR. Basel III contains an exception for countries with insufficient amounts of Level 1 assets. They have the three following alternatives:

- Establishment of contractual committed liquidity facilities from the relevant central bank. This facility will be available to the credit institutions for a fee.
- Supervisors may allow credit institutions to hold foreign-currency liquid assets.
- Countries with sufficient amounts of Level 2 assets may raise the cap on inclusion of these assets to more than 40 per cent. The haircut on these assets in excess of 40 per cent must be higher than the haircut on the Level 2 assets that lie within 40 per cent.

The Basel Committee has not yet laid down criteria for the extent to which these exceptions may be applied.

Net outflows are determined on the basis of contractual maturities of market funding and fixed run-off rates for the commitments with no contractual run-off. For example, deposits from households are divided into stable and less stable deposits. Stable deposits are assumed to have a run-off rate of at least 5 per cent within the next 30 days, while the run-off rate for less stable deposits is assumed to be at least 10 per cent.

ment profiles for long-term assets and short-term liabilities, resulting in a considerable ongoing need for refinancing, can be reduced by increasing the maturity of the funding. Banking institutions may diversify their funding and rely on stable sources of funding.

The Basel Committee summarises the complex liquidity picture of a credit institution as two specific liquidity requirements: a requirement for sufficient liquid assets in the short term, i.e. the Liquidity Coverage Ratio, LCR, and a long-term requirement for stable funding, i.e. the Net Stable Funding Ratio, NSFR. The two requirements address important aspects of

BASEL III LIQUIDITY REQUIREMENTS – CONTINUED Box 15

Net Stable Funding Ratio

The Net Stable Funding Ratio, NSFR, lays down requirements for the long-term funding structure of the credit institutions, cf. equation 2. The NSFR establishes the minimum acceptable amount of long-term stable funding based on the liquidity profile of the institution's assets and potential drawings on liquidity resulting from off-balance-sheet items.

(2) $$\frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} > 100\,\text{pct.}$$

Stable funding is defined as funding that can be expected to be stable over a 1-year horizon. Consequently, debt with residual maturity of less than 1 year is classified as less stable. For example, no distinction is made between 11-month debt issues and 3-month debt issues. This aspect will be studied in more detail in the coming years with a view to possible adjustment of the requirement prior to implementation.

Capital and debt issued and deposits with a maturity of more than 1 year are to be included in the calculation of the available amount of stable funding at 100 per cent. Stable deposits from households or small businesses without maturity or with a remaining maturity of less than 1 year are to be included at 90 per cent, while less stable deposits are to be included at 80 per cent. Loans with a residual maturity of less than 1 year from corporates are to be included at 50 per cent. Loans from credit institutions and issued debt instruments with a residual maturity of less than 1 year are not to be included.

Loans with a maturity of more than 1 year are generally included at 100 per cent in the calculation of the required amount of stable funding. Loans with a residual maturity of less than 1 year require partial or no stable funding. For example, loans to corporates with a maturity of less than 1 year are to be included at 50 per cent, while loans to households and small businesses are to be included at either 65 or 85 per cent. Cash is not included in the calculation of the required amount of stable funding. Whether securities are to be included depends on the issuer, among other factors.

The liquidity requirements will be finalised on the basis of the experience gained in the observation period that started on 1 January 2011. LCR will be introduced as a minimum requirement with effect from 1 January 2015 and the NSFR will be introduced on 1 January 2018.

the credit institutions' liquidity risks. The requirements are described in more detail in Box 15. The existing Danish liquidity requirements are defined in the Financial Business Act, cf. Chapter 2. These requirements are solely related to the institutions' short-term liquidity risks, while there are no quantitative requirements relating to stable funding. With the introduction of the Supervisory Diamond, the Danish Financial Supervisory Authority will sharpen the liquidity profile requirements for Danish credit institutions as from 2012, cf. Chapter 1. The existing requirements regarding short-term liquidity will be strengthened, and a "funding ratio"

will be introduced, which is a requirement for stable funding. The funding ratio is a simple version of the NSFR of the Basel Committee.

So far, liquidity regulation has been a national concern and has typically been less detailed than regulation in e.g. the capital area. Implementation of Basel III will entail more uniform rules in an international perspective. However, the liquidity needs of the credit institutions are determined both by the individual institution's business model and by country-specific characteristics of the national financial systems. Hence, it is important to test the rules before implementation and to take into consideration specific national circumstances, while keeping the objective of the regulation in mind.

Incentives of the new liquidity requirements

The intention of the introduction of the LCR and the NSFR is to create incentives for better liquidity risk management in the institutions. The new requirements will be considerably tighter than the existing ones. In this context it should be remembered that liquidity risk is an integral part of the activities of banking institutions, in that short-term funding is transformed into longer-term loans. The new requirements do not seek to prevent this practice, but to reduce the liquidity risk related to this.

The LCR is to reduce the institutions' short-term liquidity risks. This requirement is to ensure that the institution holds enough liquid assets to cover the liquidity run-off from its funding for a period of 30 days. This requirement will encourage the institutions to hold more highly liquid assets and to reduce their dependence on short-term market-based funding. Another incentive will be to spread the maturity dates of market-based funding more and to have more stable deposits.

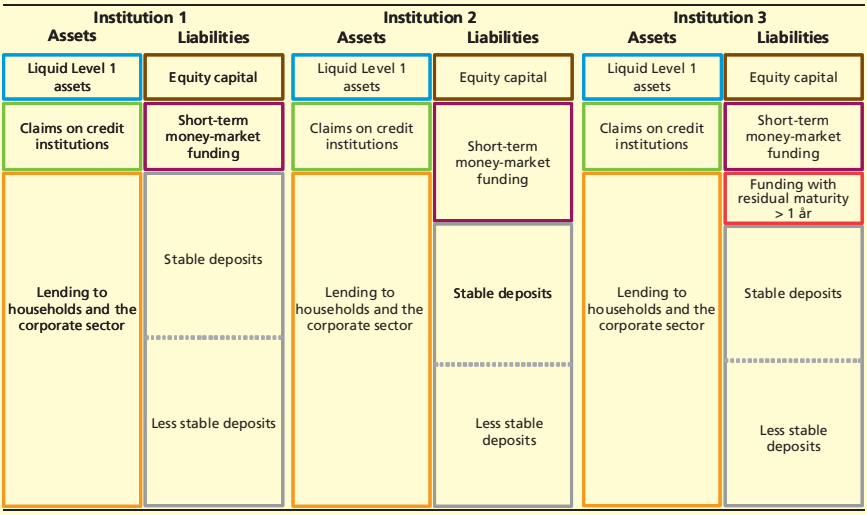
The intention of the NSFR is to ensure a better balance between the liquidity of the institution's assets, on the one hand, and the available stable funding on the other. This requirement encourages the institutions to increase the maturity of their market-based funding as the residual maturity should be more than 1 year for such funding to be included as stable funding. In addition, the NSFR provides an incentive to spread the maturity profile of market-based funding. Moreover, the NSFR encourages the institutions to replace short-term market-based funding by more stable funding.

The requirements entail no clear incentive to prefer deposits over market-based funding. Institutions with a customer funding gap can meet the requirements if, for example, their market-based funding is stable, cf. Box 16. The longer the remaining maturity, the more attractive market-based funding will be in a liquidity perspective. The relative attraction of the various types of funding will also depend on the price of the different types of funding.

LIQUIDITY REQUIREMENTS AND THE BANKING INSTITUTIONS' CUSTOMER FUNDING GAP – TO BE CONTINUED Box 16

The examples in the Chart illustrate the importance of the customer funding gap as regards the institutions' compliance with the two new liquidity requirements. Danish banking institutions overall have posted a customer funding gap in recent years. At the end of 2008, when the customer funding gap was widest, the loan stock was 1.4 times the stock of deposits. This ratio had been reduced to approximately 1.2 by the end of 2010. These examples also illustrate the importance of long-term and short-term market funding.

EXAMPLES



Note: The Chart is not an accurate reflection of the individual balance-sheet items.

The Chart shows the balance-sheet composition for three hypothetical institutions with the same asset composition of loans, cash and claims on credit institutions.

For institution 1, deposits and loans balance. Given the assumed composition of assets and liabilities, the institution's LCR and NSFR will be 128 and 100 per cent, respectively, cf. the Table.

Institution 2 has a customer funding gap, and its loan stock is 1.2 times its stock of deposits. The customer funding gap has been funded in the short-term money market.

The need for adjustment in banking institutions

The extent to which the individual banking institution will need to re-structure its balance sheet will depend on its balance-sheet structure at the point of departure, as well as the liquidity risk it undertakes. In these respects there are considerable differences between the banking institutions, reflecting different business models and differences in access to liquidity, etc.

LIQUIDITY REQUIREMENTS AND THE BANKING INSTITUTIONS' CUSTOMER FUNDING GAP –CONTINUED Box 16

Since short-term money-market funding may not be included as stable funding, the NSFR is 86 per cent, whereby the requirement is not met. The size of the LCR depends on the proportion of the short-term money-market funding – raised in order to cover the customer funding gap – maturing within the next 30 days.

- If the maturity of the short-term money-market funding is more than 30 days, the LCR is 143 per cent. The reason why the LCR is higher than for institution 1 is that this funding is not included in the net cash outflows for the next 30 days, as opposed to deposits, for which a run-off rate of up to 10 per cent is assumed, cf. Box 15.
- If, on the other hand, the maturity of the short-term money-market funding is shorter than 30 days, the LCR is 56 per cent. The reason for the lower ratio is that the amount is to be included in its entirety in the net cash outflows for the next 30 days.

The examples show the sensitivity of the LCR in relation to short-term funding. Given the NSFR distinction between residual maturity of more than 1 year or less than 1 year only, a change in the residual maturity of the short-term money-market funding has no influence on the NSFR.

LCR AND NSFR FOR BANKING INSTITUTIONS 1,2 AND 3

Per cent	LCR	NSFR
Institution 1	128	100
Institution 2	56-143	86
Institution 3	143	102

Kilde: Own calculations.

Institution 3 has used market-based funding with a residual maturity of more than 1 year to finance its customer funding gap. This results in a pronounced improvement in the NSFR relative to institution 2, and the NSFR rises to 102 per cent, cf. the Table. The NSFR is higher for institution 3 than for institution 1, although institution 3 has a customer funding gap, as opposed to institution 1. The reason is that long-term market-based financing is included at 100 per cent, while deposits are included as stable funding at either 80 or 90 per cent. Consequently, the new liquidity requirements put into focus not only the balance between deposits and loans, but also the liquidity of other assets and liabilities for the institution.

Generally, the individual banking institution should have a diversified funding structure with relatively low dependence on individual sources of funding. The new regulation can be expected to lead to a better balance between deposits and loans, longer maturities for the institutions' market-based funding and reduction of their short-term liquidity risk. This will require adjustments relative to the current situation.

There is limited experience with this type of liquidity requirements. The risk is that the requirements may be met by way of less appropriate adjustments of funding in the banking institutions. For example, it will not be appropriate if an institution meets the requirements by attracting deposits that can be classified as stable under the regulation, but turn out not to be so. Given the complexity of defining stable and less stable deposits, they are difficult to classify precisely.[1]

At the same time, it should be repeated that the Basel Committee's classification of liquid assets has a considerable inherent weakness in that it is not based on the actual liquidity of the asset, but depends on whether the issuer is e.g. a government or a mortgage-credit institute. In some cases, this does not provide an accurate picture of the liquidity of the individual assets. For example, it should be possible to include the most liquid Danish mortgage bonds – that are as liquid as highly liquid government securities – in the calculation of the LCR alongside government securities.[2] If the rules are implemented in their present form, this will create a problem for the Danish banking institutions, which to a large extent use the liquid Danish mortgage bonds in their liquidity management.

Irrespective of the long phasing-in period for the new requirements and the possible future adjustments, the banking institutions should begin to prepare well in advance and should from the outset adjust to the requirements in a manner that ensures a genuine reduction of liquidity risk for the individual institution, and for the financial system.

Adjustment requirements for mortgage-credit institutes

The new liquidity requirements present particular challenges for the Danish mortgage system, the most important reason being the widespread use of adjustable-rate loans, i.e. 30-year loans are funded by issuance of e.g. 1-year, 3-year or 5-year bonds. This implies a maturity mismatch between assets and liabilities, constituting a considerable liquidity risk. Moreover, there is a high degree of concentration in maturing of short-term mortgage bonds, cf. Chapter 2.

The examples in Box 17 illustrate the significance of the Basel III requirements for the mortgage-credit institutes. Financing long-term loans by way of short-term bonds has a major impact on the calculation of LCR and NSFR. A maturity pattern whereby many bonds mature within the next 30 days makes it difficult to observe the LCR requirement, and a large volume of bonds maturing within one year makes it difficult to observe the

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1 The Basel Committee defines stable deposits as, inter alia, deposits fully covered by the deposit guarantee scheme or a government guarantee.

2 Birgitte Vølund Buchholst: Liquidity in Danish covered and government bonds, *Monetary Review*, 1st Quarter 2011, Part 1.

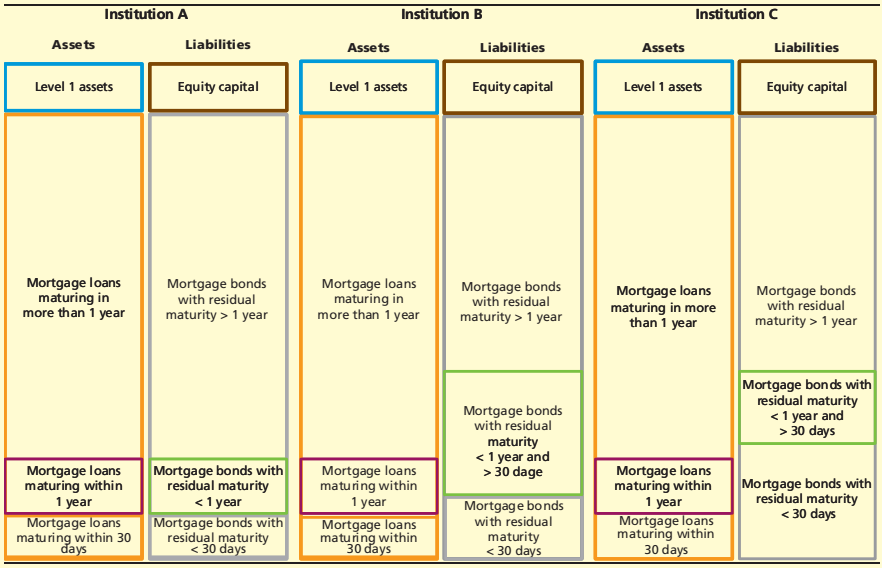
LIQUIDITY REQUIREMENTS AND ADJUSTABLE-RATE MORTGAGES
TO BE CONTINUED Box 17

The examples in this box illustrate the impact of the maturity patterns for adjustable-rate loans and bonds on the mortgage-credit institutes' compliance with the Basel III liquidity requirements.

The consequences of the new rules are analysed for three hypothetical mortgage-credit institutes:

- institute A, offering traditional 30-year fixed-rate mortgages only,
- institute B with a large share of 1-year adjustable-rate mortgages maturing evenly over the year,
- institute C with a large share of 1-year adjustable-rate mortgages maturing at the same time of the year.

EXAMPLES



Note: The Chart is not an accurate reflection of the individual balance-sheet items.

In institute A, which offers traditional 30-year fixed-rate mortgages only, the maturity profiles of loans and bonds match. In this institution, 95 per cent of the stock of assets is in the form of mortgage loans, of which 5 per cent will mature within the next year and 1 per cent will mature within the next 30 days. The institute's equity capital accounts for 5 per cent of the balance sheet and is placed in Level 1 assets.

Institute A has a very high LCR, as the volume of bonds maturing within the next 30 days corresponds to around 1/5 of the institution's holding of Level 1 assets only. In addition, outflows are to some extent offset by inflows from maturing loans.

NSFR requirement. Consequently, the new rules make it difficult to maintain the current financing structure in the mortgage-credit sector. Mortgage-credit institutes can improve their LCR by spreading the maturity of

LIQUIDITY REQUIREMENTS AND ADJUSTABLE-RATE MORTGAGES
CONTINUED Box 17

Institute A also has an NSFR of 101 per cent. Mortgage loans with a maturity of more than 1 year are fully funded by bonds with a maturity of more than 1 year. However, mortgage loans with a residual maturity of less than 1 year also require 50-85 per cent stable funding, while bond issues with a residual maturity of less than 1 year may not be included as stable funding in the NSFR. Consequently, a mortgage-credit institute is not necessarily able to meet the NSFR in the last year before a loan expires, even if there is a full match between the residual maturities of loans and the financing. The Basel Committee is investigating whether this is appropriate. In the example, institute A's compliance with the NSFR requirement can be attributed to the contribution from equity capital to stable funding.

The asset composition is the same for institute B as for institute A, but the liabilities structure reflects that the institute offers adjustable-rate mortgages. It is assumed that 1/3 of the bond issues in institute B have a residual maturity of less than 1 year, compared with 5 per cent in institute A. The maturity breakdown of the bonds in institute B matches the profile of an average Danish mortgage-credit institutes. Moreover, it is assumed that the bonds mature on a linear basis over the year. This means that approximately 3 per cent will mature within the next 30 days, and that LCR remains relatively high. The large share of short-term bond issues entails a low NSFR of 73 per cent for institute B. To reach compliance with the NSFR requirement, institute B will have to increase the amount of stable funding by expanding its equity capital or raise market-based funding with a residual maturity of more than 1 year.

Institute C has the same balance-sheet composition as institute B with the exception of the maturity profile of the bonds issued to finance adjustable-rate mortgages, which is assumed to reflect the current maturity profile in the Danish mortgage sector. It is assumed that 3/4 of the bonds with a residual maturity of less than 1 year mature within the next 30 days, as is the case in December for loans subject to rate adjustment in January. This results in an LCR of 21 per cent, which is well below the requirement. The NSFR is the same as for institute B.

LCR AND NSFR FOR INSTITUTES A, B AND C

Per cent	LCR	NSFR
Institute A: institute with fixed-rate 30-year bonds	1,053	101
Institute B: institute with 30 per cent adjustable-rate mortgages with a linear maturity profile over one year	231	73
Institute C: institute with 30 per cent adjustable-rate mortgages of which ¾ maturing within the next 30 days	21	73

Source: Own calculations.

the bonds more evenly over the year, cf. Chapter 2. Moreover, they can refinance the adjustable-rate loans more than 30 days before the bonds mature. Earlier refinancing was part of the proposal from the sector con-

cerning restructuring the process of issuing new short-term bonds so that bonds are issued at least one month before the preceding bonds mature. Another element of the sector's proposal was that issues linked to a single refinancing process can be spread over e.g. 3 months, as opposed to the existing model with sales on a limited number of auction days. This has no direct impact on the calculation of the LCR, but will contribute to reducing the liquidity risk. However, proposal will not facilitate compliance with the NSFR requirement. Maturing short-term bonds linked to adjustable-rate loans are expected to amount to kr. 842 billion in 2011. Most of this amount needs to be refinanced, and if the NSFR requirement had been in force at the beginning of the year, the funding requirement should have been offset by an equivalent amount of stable funding.

Even though it is expected to take some years before Basel III is implemented, the mortgage-credit institutes should already begin to seek inspiration in the new requirements and consider the options for securing more stable funding. By preparing well in advance, they can reduce any transitional problems linked to the large volume of adjustable-rate mortgages.

7. Macroprudential regulation

The purpose of macroprudential regulation is to promote financial stability for the benefit of economic growth and welfare. Thus, macroprudential regulation is intended to supplement other macroeconomic stabilisation policies such as fiscal and monetary policies. But macroprudential regulation is no substitute for sound macroeconomic policies.

Macroprudential regulation is intended to address systemic risks in the financial system. Hence, macroprudential regulation also supplements microprudential regulation which focuses on the resilience of individual financial institutions. Systemic risks may build up over time or they may at a given time be concentrated in a specific part of the financial system, e.g. in a systemically important financial institution. If systemic risks materialise, this may cause financial instability and have considerable consequences for economic growth and welfare.

The need to identify and address risks in the financial system exists in all countries. As a result of the financial crisis, a number of initiatives to promote macroprudential supervision have therefore been launched. Future EU capital requirements will introduce a macroprudential instrument in the form of a countercyclical capital buffer. The buffer will primarily limit risks that are generated over time. The buffer is built up during times of excessive lending growth, and it is reduced during bad times.

At the global level it is discussed how to manage risks concentrated in global systemically important financial institutions. Global initiatives remain to be implemented, but higher capital requirements are being debated, e.g. through requirements in terms of contingent convertible bonds, CoCos.

Danmarks Nationalbank considers macroprudential regulation a central element of the framework that is to ensure robust management of systemic risks in future.

BACKGROUND

In the period up to the financial crisis, risks built up in the financial system. Financial institutions had higher leverage, rising customer funding gaps and increased use of short-term funding. This made the system vulnerable to changes in macroeconomic developments and market conditions. When the crisis began, the Danish financial system was not sufficiently capitalised to withstand a period of major losses. The regulatory

framework, which was primarily microprudential and focused on the resilience of individual institutions, had neither prevented the build-up of considerable systemic risks nor created sufficient buffers in the financial system.

CAUSES OF SYSTEMIC RISKS

Systemic risk can be defined as the risk of events that prevent the financial system from functioning as an efficient provider of capital and financial services to such an extent that it has a significant impact on economic growth and welfare.

There are two major aspects in relation to systemic risk. Firstly, there is a collective tendency for banks to show strong risk appetite as they approach the top of the credit cycle and waning risk appetite as they approach the bottom. These behavioural characteristics are procyclical; they amplify economic fluctuations, and thereby result in welfare loss. Secondly, there may be financial institutions which are so important to the functioning of the financial system that they are irreplaceable. This concentration of systemic risk means that it could cause financial instability if these institutions were discontinued.

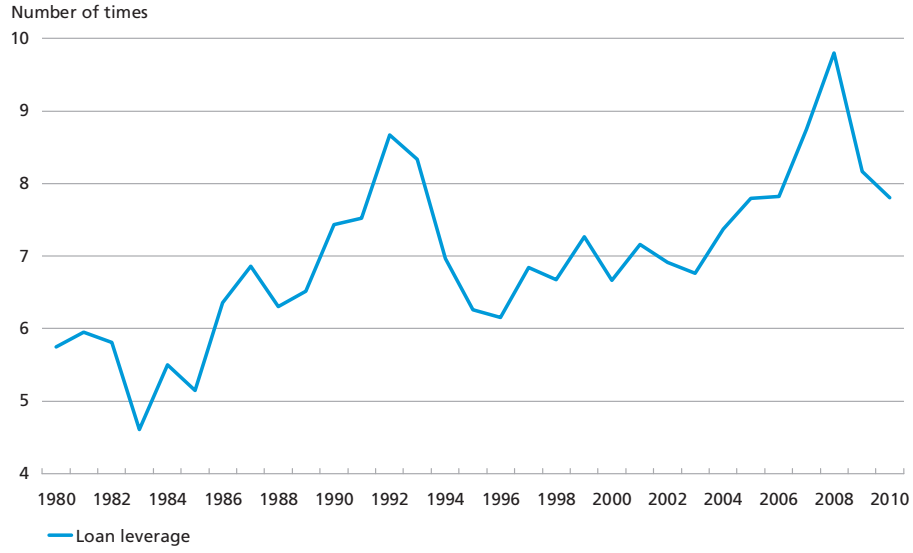
Systemic risks that vary over time

Systemic risks build up during the expansive phase of the credit cycle. In good times there is a tendency for higher leverage and increased liquidity risk in the financial, corporate and household sectors. When the macroeconomic outlook or the outlook in the financial markets deteriorates and the financial institutions' losses increase, leverage and liquidity risk are reduced. In Denmark, there was a considerable build-up of leverage before the Nordic banking crisis in the late 1980s/early 1990s as well as before the financial crisis, cf. Chart 62. This was followed by a decline in leverage after the crisis had set in.

High leverage at the onset of the two crises increased the vulnerability of the banking institutions to changes in macroeconomic developments and market conditions. During the financial crisis, this vulnerability was amplified by the fact that in the pre-crisis years the banking institutions made increasing use of short-term financing, cf. Chart 63. It increased the banking institutions' dependence on money-market financing and thus their liquidity risks.

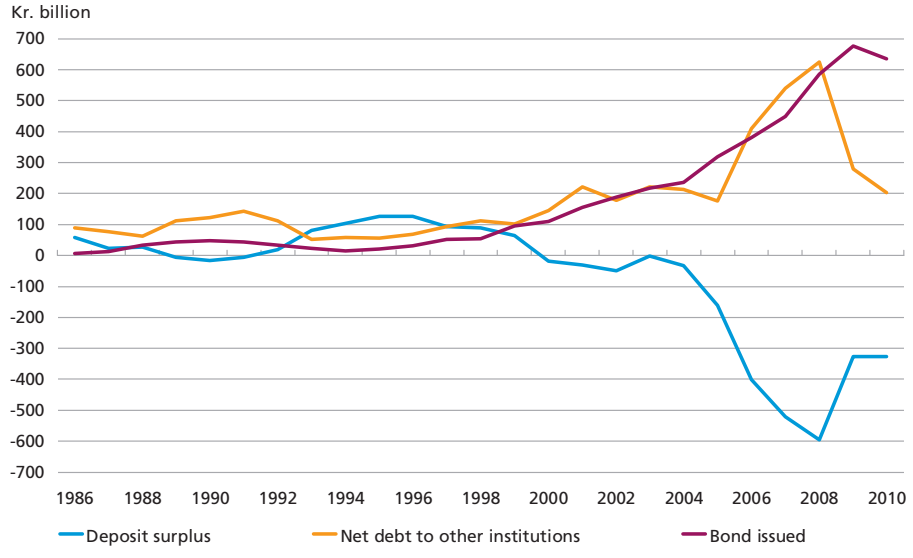
This procyclical behaviour is a consequence of, among other things, the way market participants measure and respond to changes in risk. For individual banking institutions it may be necessary e.g. to sell assets in a falling market in order to reduce risk. This effect is amplified if the institutions

LOAN LEVERAGE OF DANISH BANKING INSTITUTIONS Chart 62



Note: Calculated as lending after loan impairment charges as a ratio of equity capital. Data for the period 1980-2006 comprises institutions in groups 1-3. Data for the period 2006-10 comprises groups 1-4.
Source: Danish Financial Supervisory Authority.

CUSTOMER FUNDING GAP AND MARKET FUNDING Chart 63



Note: Data for the period 1986-2006 comprises institutions in groups 1-3. Data for the period 2006-10 comprises groups 1-4.
Source: Danish Financial Supervisory Authority.

are highly leveraged, and the behaviour can be further amplified by regulation. When many financial institutions want to sell at the same time in falling markets, asset prices will decline further, and this may generate a negative spiral and the risk of financial instability. This will negatively affect the real economy, which will then be reflected in the financial institutions' balance sheets. This will, in turn, affect the real economy, and so on and so forth. Fire-sale prices do not reflect fundamental values and in a long-term perspective, it would therefore be advantageous for financial institutions to continue holding their assets.

Risks concentrated in systemically important financial institutions

Systemically important financial institutions, SIFIs, are central to the economy and the financial system to the extent that it will entail significant macroeconomic costs if they become subject to a disorderly winding-up and cease to function. The systemic importance of a financial institution depends, among other things, on its size, complexity and interlinkage with the rest of the financial system. For instance, the SIFI's market share may be so large that the remaining system may not immediately be able to meet the demand it would leave behind. The SIFI may be interlinked with the remaining system or constitute a central node in the system infrastructure in such a way that its winding-up would cause problems to other parts of the system.

The expectation that a financial institution is "too big to fail" and will therefore be bailed out by the government in the event of problems may in itself increase instability. Since the institution gains when things go well and expects to be rescued in the event of difficulties, it will have an incentive to take excessive risks. Furthermore, if investors also expect the SIFI to be rescued, it will be able to finance itself at a lower cost than non-systemic institutions with a similar risk profile. Competition is distorted in favour of SIFIs, which will grow at a faster pace than other institutions, and over time more risk may thus be concentrated in the SIFIs. An unlevel playing field could also lead to the build-up of systemic risk if it leads to greater risk appetite among institutions that do not have this competitive advantage. This could be the case if, say, the institutions use each other as benchmarks for measuring their own performance and, in an attempt to match the competition, incur higher risks.

Measuring systemic risk

A basic precondition for managing and regulating systemic risk is that it can be measured and monitored. The IMF has conducted a survey of the indicators used today, cf. Box 18. New indicators are being developed in addition to the indicators already used.

INDICATORS OF SYSTEMIC RISK Box 18

The IMF has conducted a survey among 60 countries[1] of the different indicators currently used to identify systemic risk.

In relation to identifying systemic risk over time, the following is, among others, monitored:

- credit-to-GDP gap measures
- asset prices
- indicators of the real economic and financial cycles (domestic, external and sectoral imbalances, etc.)
- leverage ratios in the financial, corporate and household sectors
- liquidity risk (e.g. ratios of stable to less stable deposits)
- Value-at-Risk (VAR) measures
- stress tests of solvency and liquidity.

To identify systemic risk at a given point in time the following is, among others, monitored:

- measures of concentration (calculated as assets, credit, deposits, etc. as a ratio of market size or GDP)
- measures of financial institutions' contribution to systemic risk based on e.g. their complexity, size and interlinkages
- linkages through bilateral balance sheet exposures across countries or financial institutions
- risk transfers across sectors in a given country
- market-based risk measures incorporating e.g. balance sheets for banking institutions, equity prices and prices of credit derivatives.

[1] IMF: Macroprudential Policy: An Organizing Framework, 2011.

MACROPRUDENTIAL REGULATION: OBJECTIVE AND INSTRUMENTS

The objective of macroprudential regulation is to limit systemic risks in the financial system and to promote financial stability, for the benefit of economic growth and welfare.

Macroprudential regulation supplements microprudential regulation. Microprudential regulation focuses on the risk and behaviour of individual financial institutions, whereas macroprudential regulation includes the systemic effect of the behaviour of and risk assumed by the financial players. Thus, macroprudential regulation takes endogenous risks into account in the form of e.g. self-reinforcing behaviour.

This objective is similar to the objectives for other macroeconomic stabilisation policies such as fiscal and monetary policy, aimed at promoting stability, growth and welfare. These policies should supplement each other in terms of ensuring stability. Macroprudential regulation cannot replace

sound macroeconomic policies. The more other economic stabilisation policies restrict the build-up of systemic risk, the lower the need for macroprudential measures. For example, strong increases in house prices combined with growth in mortgage loans could contribute to the build-up of systemic risk. Macroprudential instruments can limit the build-up of systemic risk, but the underlying causes must also be addressed, e.g. through housing taxes and countercyclical fiscal policy.

Instruments

Microprudential and macroprudential regulation both primarily use regulation aimed at the capitalisation and liquidity of the individual institutions. The major difference is that the purpose of the instruments in a macroprudential context is to limit systemic risks. For example, countercyclical capital buffers regulate how much capital the institutions need to hold from a macroprudential point of view, while the individual capital need (under pillar 2) regulates how much capital they should hold from a microprudential point of view.

The purpose of regulating systemic risk fluctuations over time is to increase the resilience of the financial institutions and dampen the build-up of systemic risks in good times. At the same time, it is to reduce barriers to risk-taking and lending in bad times in order to stimulate economic activity. Macroprudential regulation is thus to compensate for the procyclicality in the institutions' behaviour and procyclicality due to the unintended result of other regulation. Regulation of systemic risk concentration across financial institutions is to ensure the robustness of the economic development to the winding-up of individual institutions and to protect the system from risks resulting from an unlevel playing field.

Macroprudential regulation needs to be resilient to uncertainty and structural changes in the financial sector. This requires, among other things, that systemic risks are actually reduced and not just moved from one place to another where regulation is more lenient or non-existent. This is a challenge since the financial sector is constantly developing and regulation in itself may lead to structural changes over time. As a result, the requirements for the analytical apparatus and the efficiency of the instruments will change over time. Regulation must therefore be based on a set of models and indicators, and the efficiency of the instruments must be evaluated on an ongoing basis. The coming EU legislation should be sufficiently flexible to allow for changes in macroprudential regulation.

Box 19 presents examples of possible macroprudential instruments and instruments that may have a significant macroprudential effect.

EXAMPLES OF MACROPRUDENTIAL INSTRUMENTS AND INSTRUMENTS WITH SIGNIFICANT MACROPRUDENTIAL EFFECT — Box 19

Examples of instruments for the management of systemic risk generated over time

- Countercyclical capital buffers
- Capital conservation buffers
- Taxes on parts of the banks' balance sheets
- Liquidity requirements
- Countercyclical LTV (loan-to-value)
- Countercyclical LTI (loan-to-income)
- Countercyclical limitations of banks' lending compared to deposits
- Countercyclical risk weights for exposures to specific sectors
- Countercyclical caps and limits for credit and credit growth, including leverage
- Dynamic provisions for losses

Examples of instruments for the management of concentration of systemic risk

- Higher capital requirements for systemically important institutions, including the use of CoCos
- Higher liquidity requirements for systemically important institutions
- Taxes on parts of the banks' balance sheets
- Higher capital requirements for transactions not cleared via central counterparties
- Split-up of financial institutions
- Limitation of concentration risk
- Premiums for derivative liabilities
- Risk premiums for the Guarantee Fund for Depositors and Investors
- Restrictions on permitted activities for systemically important institutions (e.g. concerning investments on their own account, proprietary trading)

Source: IMF, ESRB and Danmarks Nationalbank.

Automatic stabilisers and discretionary instruments

Macroprudential instruments can be divided into automatic stabilisers and discretionary instruments. Automatic stabilisers[1] have the advantage that they are able to reduce systemic risks without active intervention on the part of the macroprudential authority. One drawback is that their efficiency may be reduced by developments in the financial sector.

The use of discretionary instruments requires an active decision. They have the advantage that they will be able to address system conditions that change over time. But they also have some drawbacks. Firstly, decisions to implement instruments will have to be made on the basis of uncertain information. Secondly, a decision should be expected to meet resistance at the time it has to be made. It may consequently be difficult to

[1] One example of an automatic stabiliser is the capital conservation buffer. Financial institutions without a buffer of 2.5 per cent of their risk-weighted assets are restricted as regards dividend and bonus payments, etc. This gives the institutions the opportunity to use their capital in bad times and an incentive to hold their capital whenever possible, cf. Box 15 in Chapter 6. Another example of an automatic stabiliser is the leverage ratio which imposes a ceiling on leverage in the financial sector, cf. Borka Babic, Status on Basel III – liquidity and capital, Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2011.

time the use of the instruments correctly. Combining elements from the two by way of rules that can be deviated from when warranted by the circumstances ensures a high degree of predictability and the probability of timely implementation is increased, while some flexibility is retained. Establishment of automatic stabilisers and macroprudential instruments that are based on rules requires suitable indicators of systemic risks. As the financial sector is in constant development, there is also a need to be able to use discretionary instruments. Predictability may, however, be supported by a clear macroprudential mandate and open communication about what is important for decision-making.

The countercyclical capital buffer introduced in the coming EU regulation is an example of a macroprudential instrument that is based on a rule. As a main rule, the buffer is to be determined on the basis of the gap between aggregate credit to the private sector relative to GDP and the trend level.

MACROPRUDENTIAL ELEMENTS OF THE COMING REGULATION

The coming capital adequacy rules in the EU legislation following Basel III, will tighten regulation in four principal areas: strengthening of the quality and quantity of bank capital, introduction of capital buffers, introduction of a leverage ratio and quantitative liquidity requirements. Most tightening measures are microprudential regulation, but they may to some extent contribute to reducing systemic risks. An actual macroprudential tool in the form of the countercyclical capital buffer is also introduced. In addition, the Financial Stability Board, FSB, is expected to present a proposal for the management of global SIFIs.

Capital adequacy rules and systemic risk

The tendency for banks to increase their leverage in the expansionary phase of the credit cycle has a major impact on the build-up of systemic risks. Stronger *capital requirements* and the introduction of a *leverage ratio* restrict the extent to which financial institutions can increase their risk. The capital requirement depends on the current risk assessment. Because of this construction, institutions can hold less capital at low risk than at high risk. Consequently, financial institutions may increase their leverage when the asset risks are assessed to be low, while institutions are forced to reduce their leverage when the risks are assessed to be high. In this way, the capital requirements may support procyclical behaviour. Experience shows that the risk measures applied have a tendency to underestimate risk in the expansionary phase. The leverage ratio supplements the capital requirements to avoid this effect.

The *capital conservation buffer* and the *countercyclical capital buffer*[1] introduce buffers above the capital requirement. The capital buffers can absorb losses while operations continue. The countercyclical capital buffer is to be built up during times of excessive lending growth in the economy where systemic risks increase and may be reduced in bad times. It is to support financial stability by ensuring that the credit institutions hold capital to withstand a period of severe losses, especially if many credit institutions suffer such losses at the same time. Moreover, it is likely that the build-up of the buffer in good times will in itself dampen the banks' lending growth, thereby reducing the build-up of systemic risks. If the institutions fail to meet the buffer requirements, their dividend and bonus payments, etc. will be restricted. The purpose is to give the institutions incentives to build up and hold the buffers whenever possible while retaining the flexibility to use the capital to absorb losses when necessary.

The Basel III proposals also include two new quantitative *liquidity measures*. One measure, the Net Stable Funding Ratio, sets out minimum requirements for stable funding, thereby restricting the possibility of increasing liquidity risks. The other measure, the Liquidity Coverage Ratio, focuses on the size of the banks' liquid buffers, cf. Chapter 6.

SYSTEMIC INSTITUTIONS

The FSB is preparing proposals to reduce SIFI-related risks. Initially, the focus is on global SIFIs where no Danish institutions are expected to be included. The concentration of systemic risk in an institution is mitigated by reducing the probability of a failing SIFI and by limiting the potential pass-through to the economic development if a SIFI incurs problems after all. Further, the elements that distort competition must be addressed, and the institutions must be given incentives to reduce their systemic risk. Broadly speaking, the potential regulatory instruments can be grouped into four classes: strengthened supervision, higher capital requirements, winding-up mechanisms and structural measures.

Strengthened supervision of SIFIs is to reduce the probability of a SIFI encountering financial difficulties. Higher capital requirements in good times to provide capital which may be used in bad times are to result in a higher loss capacity while also reducing the probability of a failing SIFI. Higher capital requirements are also intended to create a better basis for the possible restructuring of a SIFI. At the same time, higher capital re-

[1] The countercyclical capital buffer is further discussed in Mads Peter Pilkjær Harmsen, Basel III: Macroprudential regulation by means of countercyclical capital buffers, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2010.

CONTINGENT CAPITAL Box 20

Contingent capital is debt with a fixed maturity and fixed interest payments that is automatically converted into shares or written down when a preannounced event occurs. Contingent capital can "automatically" increase the equity capital or reduce the debt of a financial institution during periods of financial stress. That way, an institution will be able to strengthen its capitalisation during periods when it is difficult to find new shareholders or market conditions are unfavourable. Furthermore, these instruments may contribute to reducing the risk assumed by the financial institutions as the management, shareholders and bondholders can expect losses in the event of a conversion and dilution or if the value of the bonds is written down.

These instruments are largely untested and it is still being debated how to design them most expediently with a view to being an efficient tool for the consolidation or winding-up of banks. Significant aspects are possible investor reactions (when an institution approaches a conversion), possible market reactions to the instruments and the trigger mechanism for conversion. As regards the trigger mechanism, the bank's equity capital has been proposed in Switzerland, cf. Box 21. One alternative is market-based triggers, such as share price or credit default swap spread (CDS). To reduce the effect of outliers, e.g. as a result of manipulation, a moving average of the market price used is typically suggested. Another alternative is for the supervisory authorities to establish the time of conversion on a discretionary basis.

quirements may reduce competitive distortions and give the institutions an incentive to become less systemic.

One way of increasing the capitalisation of SIFIs, which is the subject of intense discussion internationally, is contingent capital, e.g. in the form of bonds that are automatically converted into shares when, for example, the solvency ratio has been reduced to a predefined level or supervisory authorities deem it appropriate to convert the capital. These are called contingent convertible bonds. Contingent capital is to ensure that an institution automatically increases its equity capital at a time when the bank would otherwise find it difficult to raise capital in the markets, cf. Box 20.

A prerequisite for efficient management of SIFIs is that restructuring should be a possibility without unacceptable costs to the economy or the government. This may require that the institutions develop firm-specific contingency and resolution plans and that they cooperate with the authorities to identify factors which may be important in connection with their own winding-up. An efficient winding-up plan will reduce the pass-through to the economy in connection with the winding-up. At the same time, the possibility of winding up SIFIs will reduce distortions of competition and the incentive to assume risk.

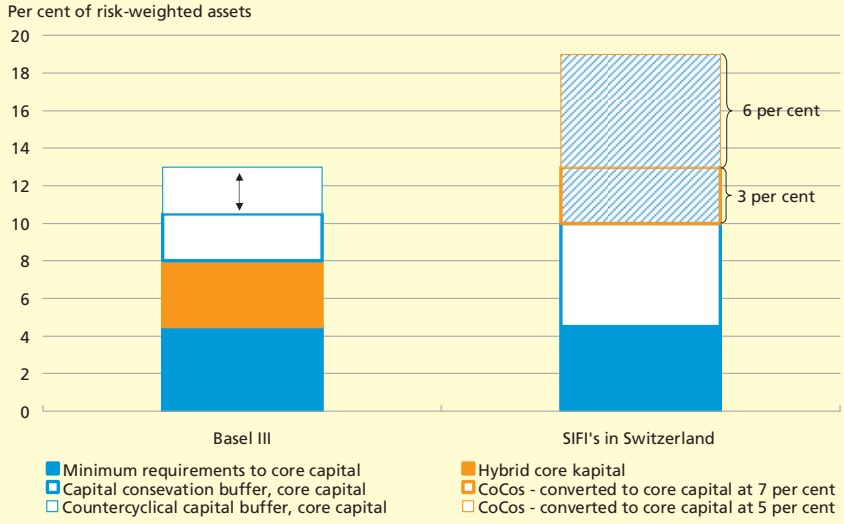
Structural measures, such as restricting SIFI's areas of activity, will also reduce the potential pass-through in connection with the winding-up and create incentives for the institutions to reduce their systemic importance.

REGULATION OF SYSTEMICALLY IMPORTANT INSTITUTIONS IN SWITZERLAND – TO BE CONTINUED Box 21

The Swiss government has proposed particularly high capital requirements for two systemically important Swiss banks – Credit Suisse and UBS. Before the crisis, the two banks' balance sheets totalled more than 4.5 times Switzerland's GDP.

The bill raises the regulatory capital requirement to 19 per cent of risk-weighted assets for Credit Suisse and UBS, of which 10 per cent must be Common Equity Tier 1 and 9 per cent may be contingent capital in the form of contingent convertible bonds (known as CoCos), cf. the Chart. 3 per cent thereof must be converted into equity capital at a high conversion point, which has been set to 7 per cent of Common Equity Tier 1. The remaining 6 per cent is converted into equity capital at a low conversion point, which has been set to 5 per cent of Common Equity Tier 1. The trigger mechanism is thus contractually defined on the basis of Common Equity Tier 1 as a ratio of risk-weighted assets. The bill also includes the option of writing down the bond value as an alternative to converting the bonds into equity capital.

CAPITAL REQUIREMENTS



Note: Federal Council, Swiss Confederation: Dispatch on strengthening financial sector stability (too big to fail), 2011.

CoCos with a high conversion point are designed to meet a bank's recapitalisation needs with a view to continuing operations in case of deteriorating capitalisation. For example, in case of a fall in Common Equity Tier 1 to 7 per cent, UBS would be able to receive injections of 3 per cent further Tier 1 from CoCos, after which it would have 10 per cent of Common Equity Tier 1 and 6 per cent in the form of CoCos. This may help reducing systemic risk by ensuring capital injections long before a bank faces serious difficulties and risks losing access to the market.

CoCos with a low conversion point may be a useful tool for the controlled winding-up of the bank. If, after a first conversion, Credit Suisse experiences a fall in its Common Equity Tier 1 to 5 per cent, the bank will receive capital injections of 6 per cent of

REGULATION OF SYSTEMICALLY IMPORTANT INSTITUTIONS IN SWITZERLAND – TO BE CONTINUED Box 21

Common Equity Tier 1 as a result of the other conversion. Thus, prior to being wound up, it would have Common Equity Tier 1 of 11 per cent. UBS and Credit Suisse must also present a winding-up plan for continuation of systemically important banking functions in the event of threatened insolvency.

The government's bill is based on a report from the Commission published in September 2010. The bill is expected to be debated in parliament in 2011. If adopted, the rules will come into effect at the beginning of 2012 at the earliest, and a running-in period until end-2018 is proposed.

Global initiatives have yet to be implemented, but the Swiss government has already launched initiatives for stricter regulation of SIFIs with a view to reducing the probability of considerable costs to society, cf. Box 21.

INSTITUTIONAL FRAMEWORK IN THE EU

In order for macroprudential regulation to be efficient in practice, the institutional framework must be in place. It is necessary to give specific authorities clear macroprudential powers and responsibilities.

To this end, the authorities need access to the necessary information and must be in a position to build up the analytical capacity required to perform analyses of systemic risks. The analyses should comprise both the financial sector and the macroeconomy. On the basis of the analyses, policy initiatives to address the identified risks will be taken. Macroprudential authorities should be empowered to ensure implementation of the measures required to influence financial players so that systemic risks are reduced.

The gain from limiting systemic risk is invisible to the public, whereas the costs can be highly visible and have an immediate effect on growth. Authorities with macroprudential powers should therefore be ready to make decisions which will be met with resistance, but which will promote economic growth and welfare in the longer run.

Many financial institutions have cross-border operations, so there is also a need for close international coordination of macroprudential regulation. The EU has established an independent body, the European Systemic Risk Board, ESRB, which is responsible for macroprudential supervision in the EU.

The objective of the ESRB is to contribute to the prevention and reduction of systemic risks in the EU. It is charged with collecting and analysing the information required to be able to detect and prioritise systemic risks. When this is deemed necessary, the ESRB must issue – and monitor the

follow-up on – warnings or recommendations concerning measures to address the identified risks.

The organisation of the ESRB is to comprise a General Board, a Steering Committee, a Secretariat, an Advisory Scientific Committee and an Advisory Technical Committee. The Chairman of the Board of Governors of Danmarks Nationalbank participates in the General Board, and Danmarks Nationalbank is a member of the Advisory Technical Committee. The European Central Bank, ECB, provides analytical, statistical, administrative and logistics support, and the ESRB gets technical advice from the national central banks and supervisory authorities. The ESRB cooperates with three European supervisory authorities[1] to ensure that the macroprudential risk assessment is based on exhaustive information about developments in the financial system.

[1] The European supervisory architecture is elaborated on in Birgitte Bundgaard Madsen and Louise C. Mogensen, A new European supervisory architecture, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2009.

Appendix 1: The Winding-up Scheme under Bank Rescue Package 3

Background and objectives

The general government guarantee under Bank Rescue Package 1 expired on 30 September 2010, meaning that unsecured creditors in Danish banking institutions, including deposits, are no longer guaranteed by the government. In the event of compulsory liquidation of a banking institution, the Guarantee Fund for Depositors and Investors will cover registered deposits up to an amount corresponding to 100,000 euro. In addition, certain tax-deductible special deposits, including certain pension savings and children's savings accounts, will be fully covered. Depositors with net deposits of more than 100,000 euro will not be fully covered. Instead, they will have a claim against the estate equivalent to the remainder of the amount and will obtain dividend only when the estate has been wound up.

Compulsory liquidation is not an appropriate way to manage failing banking institutions. Depositors' payment cards will be closed, and loans will be called. At the same time, a forced sale of assets would normally cause creditors great losses. Varde Bank, Himmerlandsbanken and Roskilde Bank are examples of failing banking institutions for which it was necessary to find ad hoc solutions as an alternative to compulsory liquidation. Then, the Danish government and Danmarks Nationalbank were both active participants in the management of the failing banking institutions.

Bank Rescue Package 3, which entered into force on 1 October 2010, established a permanent model for winding up failing banking institutions. The winding-up scheme aims to be a clear and predictable alternative to compulsory liquidation. A permanent model reduces the risk of the money market factoring in an implicit government guarantee behind the banking institutions. At the same time, controlled winding-up will contribute to ensuring the value of the assets in case of a continuation of the failing banking institution's activities, thereby taking both creditors and financial stability into account.

Under the winding-up scheme,failing banking institutions sell their assets to a subsidiary of the Financial Stability Company, which is owned by the Danish government. The scheme does not exclude other solutions by way of private transfers. Accordingly, the scheme is only meant to be implemented if a market solution cannot be found.

The winding-up scheme is voluntary, leaving it up to the individual banking institutions to decide whether they want to be wound up under the winding-up scheme or according to the compulsory liquidation rules. At the recent annual general meetings, the shareholders or guarantors of individual banking institutions had the opportunity to indicate whether the respective banking institutions would use the winding-up method if they were to become ailing. For the great majority of the banking institutions, the general meeting did not wish to make such an indication. For those banking institutions it will be up to their boards of directors to decide on the choice of winding-up method if and when it becomes necessary.

On several occasions, Danmarks Nationalbank has expressed its support of the winding-up scheme. In future, unsecured creditors must expect to incur losses on loans to banking institutions in the same way as creditors in other business enterprises. This will contribute to ensuring a robust and self-contained financial system and reduce the risk assumed by banking institutions.

On 29 April 2011, the Minister for Economic and Business Affairs tabled a bill with incentives to finding a private solution for a failing banking institution without transfer to the Financial Stability Company. This bill enables the Guarantee Fund for Depositors and Investors to participate actively in the winding-up of the failing banking institution by providing a "dowry" in the form of funds or guarantees in relation to a prospective buyer.

The winding-up process – step by step

The management of a failing banking institution under the winding-up scheme can be outlined in the following steps:

- The banking institution's management or the Danish Financial Supervisory Authority establishes that the banking institution does not meet the capital requirement of the Danish Financial Business Act. The Financial Supervisory Authority lays down a time limit within which the capital is to be re-established.
- Within six hours of the laying down of the time limit, the banking institution notifies the Danish Financial Supervisory Authority of whether it wishes to be wound up under the winding-up scheme or according to the compulsory liquidation rules if the banking institution is unable to re-establish its capital within the time limit (the following steps assume that the banking institution chooses to be wound up under the winding-up scheme and fails to find another solution within the time limit).

- Over the next 24 hours, the banking institution provides a number of lists and information to the Financial Stability Company with a view to immediate valuation of the institution's assets, including the preparation of an opening balance sheet based on the realisable value and a statement of deposits covered by the Guarantee Fund for Depositors and Investors. Under Danish legislation, the banking institutions are subject to an obligation to have efficient administrative procedures and systems ensuring that they are prepared and able to provide the required information within a very short period of time.
- The board of directors of the relevant banking institution enters into a conditional agreement with the Financial Stability Company about the transfer of the banking institution's assets etc. to a subsidiary of the Financial Stability Company (New Bank). A preliminary transfer sum is agreed based on the values at which the assets can be expected to be sold on the date of transfer – irrespective of goodwill and other intangible assets – less expected sales costs.
- As payment for the assets, New Bank acquires a proportionate share of the uncollateralised non-subordinated liabilities. Part of the transfer sum is retained in the form of a balance to be used for deferred adjustment of the transfer sum. Deposits that can be offset against any claim against the depositor are transferred in full. New Bank also takes over all employees and employee obligations. Bilateral agreements are taken over to the extent this is possible in accordance with the provisions of the agreements. Share capital, guarantor's capital or other subordinated capital is not taken over.
- New Bank receives capital injections and liquidity from the Financial Stability Company, thereby meeting the capital and liquidity requirements of the Danish Financial Business Act. The Financial Stability Company can provide the necessary financing by obtaining government relending.
- New Bank calculates the coverage of the individual depositors under the Guarantee Fund for Depositors and Investors and pays an amount on account into the accounts of the customers concerned. New Bank enters into those customers' claims against the Guarantee Fund for Depositors and Investors. Customers with net deposits of less than 100,000 euro will still have access to the full amount. Customers with net deposits of more than 100,000 euro, will, in addition to the 100,000 euro, have access to a proportionate share of the remaining amount.
- The transfer is published. The next day, New Bank opens at the usual time at the failing banking institution's existing address. The customers may use payment cards, Internet banking and direct debit as usual.

- New Bank advertises for creditors barring claims not lodged against the failing banking institution within three months.
- As soon as possible after the expiry of said advertisement, two auditors appointed by the Institute of State Authorised Public Accountants must finally determine the realisable value of the assets as at the date of transfer. If the auditors find that the preliminary transfer sum is too high, the valuation of the assets must be adjusted via the outstanding balance. If, on the other hand, the auditors find that the preliminary transfer sum is too low, New Bank must take over an additional proportionate share of the non-subordinated liabilities.
- New Bank must work for the controlled winding up of its activities, including reducing and divesting existing customer relationships. Activities requiring a licence to operate a banking institution must be wound up as quickly as possible and within five years. New Bank is not allowed to compete on the terms normally offered in the Danish banking institutions market. This means that it is not allowed to use new or aggressive marketing, establish new customer relationships or expand existing exposures unless this is absolutely necessary to ensure the value of the exposure.
- The transfer sum is adjusted by any net profits in New Bank as a result of the winding-up, e.g. by retransfer or liquidation. The net profit is paid to the failing banking institution's estate and distributed among the unsecured creditors with a residual claim against the estate. Any loss in New Bank is covered by a recourse guarantee provided to the Financial Stability Company by the Guarantee Fund for Depositors and Investors.

Amagerbanken

The winding-up scheme was first used in February 2011. On Friday, 4 February 2011, Amagerbanken's board of directors had to acknowledge that the bank no longer met the statutory solvency requirement. Amagerbanken was the 9th largest banking institution in Denmark and in the years preceding the financial crisis it had experienced extremely strong lending growth, particularly for property financing. These exposures had resulted in large write-downs since the 3rd quarter of 2008 and called for the injection of new capital in December 2009 and September 2010. A review of the bank's exposures showed a need for further loan Impairment charges of kr. 3.1 billion in the 4th quarter of 2010. As a consequence, the bank's net capital was now negative by kr. 654 million.

As it turned out to be impossible to find a market solution, the bank's board of directors decided to let the bank be wound up by the Financial

Stability Company. The bank therefore entered into an agreement on transferring its assets to a new subsidiary of the Financial Stability Company named Amagerbanken af 2011 A/S.

The preliminary transfer sum was set at kr. 15.2 billion. The transfer sum was considerably lower than the existing book value less further loan impairment charges, reflecting that in accounting terms the usual going concern consideration was not applied when fixing the transfer sum. The assets were, however, fixed at their realisable value, cf. above.

The new bank acquired 59 per cent of Amagerbanken's uncollateralised non-subordinated liabilities (equivalent to kr. 15.2 billion) as preliminary payment for the assets. As a result, unsecured creditors' claims were reduced by 41 per cent to the extent that they were not covered by the Guarantee Fund for Depositors and Investors. If the final transfer sum exceeds kr. 15.2 billion, the new bank must take over a further proportionate share of the liabilities. At the time of transfer there were known liabilities of kr. 13.2 billion that had not been taken over, subordinated liabilities accounting for kr. 2.6 billion. The market value of the shares in the bank immediately before the transfer was kr. 1.1 billion. The entire investments by shareholders and holders of subordinated capital must be regarded as lost.

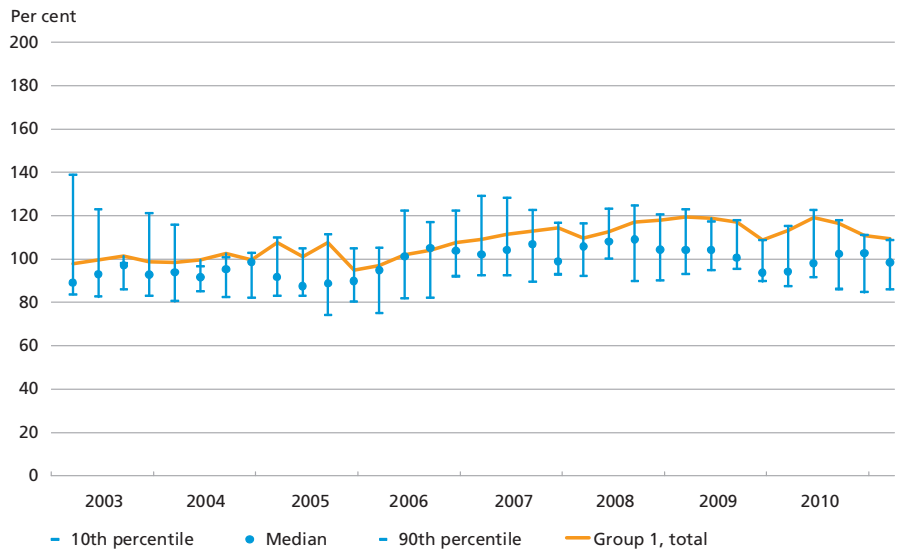
On Monday, 7 February 2011, the new bank opened its doors to customers. Amagerbanken's registration number and account in Danmarks Nationalbank had already been transferred to the new bank. Accordingly, customers and counterparties were able to execute payments to the new bank without running the risk of their payments being lost in the estate of Amagerbanken.

As a starting point, the new bank's acquisition of a proportionate share of Amagerbanken's liabilities also included bonds issued with individual government guarantees under Bank Rescue Package 2. Subject to the bondholders' acceptance of the change in debtors, the new bank subsequently offered to take over the remaining share of the government-guaranteed debt. The new bank then entered into the bondholders' claims against the government. For the bondholders, this meant that their claims against Amagerbanken were able to continue on unchanged terms, but with the new bank as the debtor. The bonds will continue to be covered by the government guarantee.

Appendix 2: Lending ratio of Group 1, 2 and 3 banking institutions

LENDING RATIOS OF GROUP 1 BANKING INSTITUTIONS, EXCLUDING REPO TRANSACTIONS

Chart 1

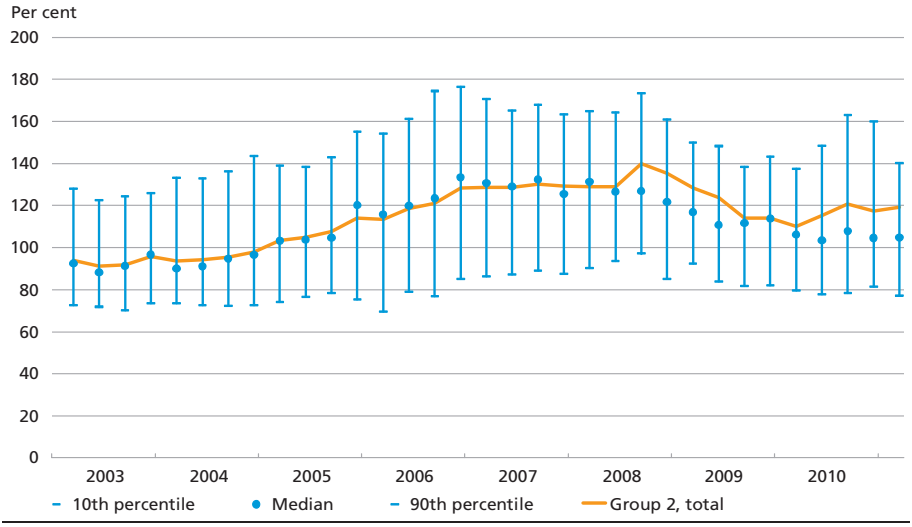


Note: Comprises banking institutions in group 1 at the beginning of 2010, excluding FIH Erhvervsbank. The lending ratio is calculated as lending to retail and corporate customers excluding credit institutions as a percentage of deposits from retail and corporate customers excluding credit institutions. The ratio in the percentiles is calculated at the level of the individual banks, while the total ratio is calculated on the basis of total deposit and lending volumes in group 1. The most recent observations are from the 1st quarter 2011.

Source: Danmarks Nationalbank.

LENDING RATIOS OF GROUP 2 BANKING INSTITUTIONS, EXCLUDING REPO TRANSACTIONS

Chart 2

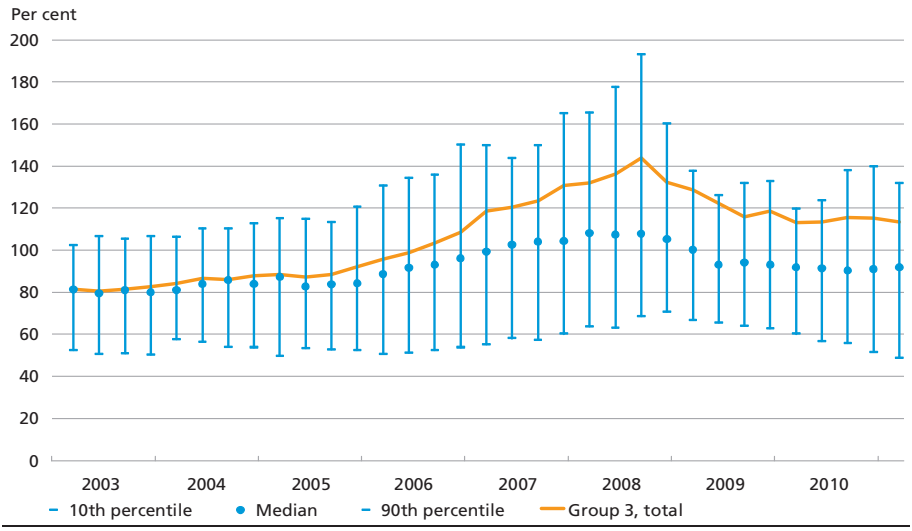


Note: Comprises banking institutions in group 2 at the beginning of 2010, including banks managed by the Financial Stability Company up to and including the transfer date. The lending ratio is calculated as lending to retail and corporate customers excluding credit institutions as a percentage of deposits from retail and corporate customers excluding credit institutions. The ratio in the percentiles is calculated at the level of the individual banks, while the total ratio is calculated on the basis of total deposit and lending volumes in group 2. The most recent observations are from the 1st quarter 2011.

Source: Danmarks Nationalbank and Financial Stability Company.

LENDING RATIOS OF GROUP 3 BANKING INSTITUTIONS, EXCLUDING REPO TRANSACTIONS

Chart 3



Note: Comprises banking institutions in group 3 at the beginning of 2010, including banks managed by the Financial Stability Company up to and including the transfer date. The lending ratio is calculated as lending to retail and corporate customers excluding credit institutions as a percentage of deposits from retail and corporate customers excluding credit institutions. The ratio in the percentiles is calculated at the level of the individual banks, while the total ratio is calculated on the basis of total deposit and lending volumes in group 3. The most recent observations are from the 1st quarter 2011.

Source: Danmarks Nationalbank and Financial Stability Company.

Appendix 3: Stress test scenarios

This Appendix provides a detailed description of the macroeconomic scenarios used in the stress test in Chapter 4.

SPECIFICATION OF SCENARIOS FOR THE DANISH ECONOMY — Table 1

	Baseline scenario	Scenario 1	Scenario 2	Scenario 3
2011				
Real growth, per cent, year-on-year				
GDP	1.9	1.6	1.2	0.8
Private consumption	1.9	1.4	1.2	0.7
Public consumption	-0.1	-0.1	-0.1	-0.1
Housing investment	0.1	-2.6	-4.8	-5.4
Business investment	3.6	2.5	-1.4	-1.6
Public-sector investments	-1.2	-1.2	-1.2	-1.2
Inventory investments (contribution to GDP growth)	0.3	0.3	0.3	0.3
Exports	4.8	4.9	3.5	2.6
- of which industrial exports	6.3	6.4	3.8	3.0
Imports	4.5	4.1	2.4	1.8
Export market growth	7.5	7.5	3.4	2.8
Nominal growth, per cent, year-on-year				
Private sector disposable income	4.9	4.9	5.0	4.6
HICP	2.4	2.4	2.6	2.4
Hourly wages (industry)	2.5	2.5	2.5	2.5
House prices	0.0	-3.3	-4.5	-3.4
Average level for the year				
Bond yield, per cent p.a.	3.2	3.4	4.7	4.3
3-month money market rate, per cent p.a.	1.2	1.4	2.7	2.3
Unemployment, thousands	113	119	119	124
Total employment, thousands	2,761	2,755	2,755	2,751
- of which private sector, thousands	1,757	1,751	1,751	1,747
Labour force, thousands	2,874	2,874	2,874	2,874
Unemployment rate, per cent	3.9	4.2	4.2	4.3
Net borrowing/net lending, private sector, kr. billion	175	183	192	193
Government budget balance, kr. billion	-82	-86	-94	-97
B.o.p. current account, kr. billion	92	96	97	95
Crude oil, dollar/barrel	113	113	113	113

SPECIFICATION OF SCENARIOS FOR THE DANISH ECONOMY — Table 2

	Baseline scenario	Scenario 1	Scenario 2	Scenario 3
2012				
Real growth, per cent, year-on-year				
GDP	1.8	0.9	-0.3	-1.8
Private consumption	2.4	0.3	0.4	-0.7
Public consumption	0.5	0.5	0.5	0.5
Housing investment	2.0	-2.9	-14.1	-13.3
Business investment	6.3	1.1	-3.6	-7.5
Public-sector investments	-8.0	-8.0	-8.0	-8.0
Inventory investments (contribution to GDP growth)	0.2	0.2	0.2	0.2
Exports	3.5	3.8	1.6	-2.3
- of which industrial exports	5.1	5.6	4.1	-1.3
Imports	4.3	2.8	0.8	-2.3
Export market growth	6.5	6.5	2.4	-4.9
Nominal growth, per cent, year-on-year				
Private sector disposable income	2.5	2.2	2.5	1.1
HICP	1.8	1.8	1.9	1.7
Hourly wages (industry)	3.0	2.6	2.6	2.2
House prices	1.2	-9.7	-6.9	-6.2
Average level for the year				
Bond yield, per cent p.a.	3.8	4.2	6.8	6.3
3-month money market rate, per cent p.a.	2.2	2.6	5.2	4.7
Unemployment, thousands	106	132	146	176
Total employment, thousands	2,769	2,743	2,729	2,699
- of which private sector, thousands	1,764	1,738	1,724	1,694
Labour force, thousands	2,875	2,875	2,875	2,875
Unemployment rate, per cent	3.7	4.6	5.1	6.1
Net borrowing/net lending, private sector, kr. billion	154	191	219	220
Government budget balance, kr. billion	-63	-82	-111	-127
B.o.p. current account, kr. billion	90	108	107	93
Crude oil, dollar/barrel	112	112	112	112

SPECIFICATION OF SCENARIOS FOR THE DANISH ECONOMY — Table 3

	Baseline scenario	Scenario 1	Scenario 2	Scenario 3
2013				
Real growth, per cent, year-on-year				
GDP	1.5	1.0	0.1	-1.2
Private consumption	1.5	0.3	0.4	0.5
Public consumption	0.2	0.2	0.2	0.2
Housing investment	3.2	0.9	-7.4	-6.8
Business investment	7.7	5.0	1.8	-2.9
Public-sector investments	-2.9	-2.9	-2.9	-2.9
Inventory investments (contribution to GDP growth)	0.1	0.1	0.1	0.1
Exports	3.2	3.7	2.8	-0.7
- of which industrial exports	4.2	4.9	5.0	2.2
Imports	4.2	3.4	2.7	0.2
Export market growth	5.0	5.0	4.5	-0.5
Nominal growth, per cent, year-on-year				
Private sector disposable income	2.6	2.6	2.8	3.0
HICP	1.7	1.6	1.6	1.4
Hourly wages (industry)	3.2	2.5	2.0	1.0
House prices	1.5	-5.1	-2.7	-2.7
Average level for the year				
Bond yield, per cent p.a.	4.3	4.6	7.3	6.8
3-month money market rate, per cent p.a.	2.5	2.8	5.5	5.0
Unemployment, thousands	101	143	175	245
Total employment, thousands	2,775	2,733	2,701	2,631
- of which private sector, thousands	1,770	1,728	1,696	1,626
Labour force, thousands	2,876	2,876	2,876	2,876
Unemployment rate, per cent	3.5	5.0	6.1	8.5
Net borrowing/net lending, private sector, kr. billion	139	198	239	237
Government budget balance, kr. billion	-53	-84	-129	-154
B.o.p. current account, kr. billion	86	114	109	82
Crude oil, dollar/barrel	109	109	109	109