Danmarks Nationalbank

Stress Tests 2nd Half

2010

DANMARKS NATIONAL BANK 2010

Stress Tests, 2nd Half 2010

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).

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Explanation of symbols:

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

Details may not add due to rounding.

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Summary

The Danish financial sector as a whole is assessed to have sufficient capital and liquidity to meet the expected economic scenario. It is, however, important to have strong capital buffers as a provision against unforeseen events. The banks should continue to consolidate and strengthen their capitalisation, while also preparing for forthcoming regulation and for repaying government capital injections, if any, from 2012 onwards. At the same time, the banks should strengthen their liquidity so that they are prepared for the expiry of issuances based on individual government guarantees in 2012-13.

The analyses in the report

Danmarks Nationalbank regularly assesses the robustness of the financial sector. Danmarks Nationalbank's stress test model tests the banks' resilience to selected macroeconomic shocks. The results take into account the interaction between macroeconomic and financial conditions, but is subject to some model uncertainty.

The banks' liquidity risks are analysed separately. This analysis sheds light on the banks' current liquidity situation, which is also stress tested.

Stress test of capitalisation

Generally, the banks appear to be sufficiently well-capitalised to withstand the expected economic development. This reflects their focus in recent years on improving their capitalisation. Since the previous stress tests in May 2010, the macroeconomic outlook has also improved so that the banks appear to be slightly stronger.

The stress scenarios are used to test the banks' resilience to falling housing prices, a strong rise in interest rates internationally and international low growth, respectively. In addition, their resilience is tested in a scenario combining more pronounced international low growth and rising interest rates. Several banks are struggling to meet the statutory capital requirement in the stress scenarios.

The stress tests cover the period until end 2012, after which new, tighter capital requirements are expected to come into force. The banks should already focus on having sufficient capital to meet the new requirements. Capitalisation should be strong, and this should be taken into account in connection with any redemptions.

Liquidity conditions

This chapter sheds light on the banks' liquidity and their vulnerability to liquidity problems. The Danish banks' customer funding gap, i.e. their need to obtain financing by way of debt to credit institutions or by issuance of debt instruments in the market, has risen since the expansion of their balance sheets really accelerated in 2004. For group 1 banks, this reflects an overall customer funding gap in foreign branches, while groups 2 and 3 have a customer funding gap in their domestic operations. The gap has been reduced since the peak in December 2008, but remains far from the balance between deposits and lending seen in 2005.

In the years with increasing customer funding gaps, financing from credit institutions gained importance, but during the financial crisis this type of financing proved to be very elusive and thus inexpedient as a basis for ordinary banking activities on such a large scale. Since the crisis, the banks' dependence on this type of financing has decreased, and a higher degree of bond financing has been followed by longer average maturities. The maturity of bonds has, however, to a large extent been determined by the general government guarantee and the individual government guarantees.

Debt financing in the short-term maturity segment has still primarily been in dollars. Danmarks Nationalbank finds that in the long term it is important to reduce dependence on individual markets that may be difficult to access in periods of stress.

As part of the intensified supervision of banks' liquidity, the banks prepare and submit liquidity stress tests. The most recent stress tests show that most institutions are well-cushioned for a prolonged period of stress. Some banks remain vulnerable, however. The expiry of the general government guarantee on 30 September 2010 was smooth.

Overall, the liquidity of the Danish banks has improved since the trough during the financial crisis. Nevertheless, there are still considerable challenges. In the opinion of Danmarks Nationalbank, the liquidity position of the sector overall is not as strong as before the banks' balance-sheet expansion began in 2004. Moreover, part of the current improvement is based on government-guaranteed issuances expiring in 2012-13. The banks must therefore prepare to obtain financing without government guarantees, while retaining the current positive development trends in the form of more long-term issuances and a smaller share of financing from credit institutions.

Stress Tests

The Danish banks have increased the volume and quality of their capital. Consequently, they have built up a capital buffer that will make them resilient to the expected economic development. In the stress scenarios, some banks will be struggling to meet the statutory capital requirements. This emphasises the importance of having strong capital buffers as provisions against unforeseen events. Given the forthcoming regulatory requirements and the phasing-out of the Credit Package, this will constitute a major challenge in the coming years.

INTRODUCTION

Danmarks Nationalbank's stress test model[1] is used to assess how robust the capitalisation of the Danish financial system is against shocks to the economy. The macroeconomic development has been modelled on Danmarks Nationalbank's most recent forecast and four stress scenarios. The stress test is based on 14 of the largest Danish banks and cover the period 2010-12.

Danish banks focus on improving their capitalisation. The banks' excess capital adequacy relative to their individual capital needs has risen strongly since end-2008, cf. Chart 1. Around 90 per cent of this increase is attributable to government capital injections, while the rest is capital acquired in the market or from a parent company. The decline in the excess capital adequacy in the 1st half of 2010 reflects a general increase in the banks' capital needs and risk-weighted assets as a result of increased credit risk on lending.

The results of the stress test show that the banks are sufficiently well-capitalised to resist the expected economic development. If, on the other hand, the economy is hit by substantial adverse shocks, some banks may, however, have difficulty in meeting the statutory capital requirements.

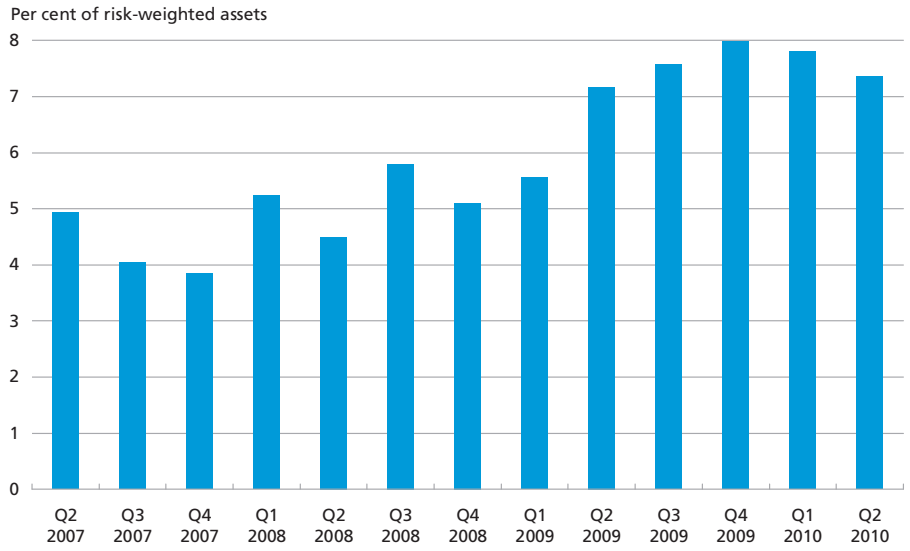
SCENARIOS

Baseline scenario

The baseline scenario is Danmarks Nationalbank's most recently published forecast for the Danish economy and reflects the development considered most likely. This baseline scenario operates with a more positive devel-

[1] For a description of Danmarks Nationalbank's stress test model, see Danmarks Nationalbank, *Financial stability,* 1st Half 2009, and Box 1 of Danmarks Nationalbank, *Stress Tests,* 2nd Half 2009.

EXCESS CAPITAL ADEQUACY RELATIVE TO INDIVIDUAL CAPITAL NEED Chart 1



Note: The Danish Financial Supervisory Authority's groups 1-3 (excluding banks managed by the Financial Stability Company).
Source: Danish Financial Supervisory Authority.

opment compared with the baseline scenario applied in Financial stability 2010, cf. Table 1. Especially the unemployment forecast has improved, but growth in the gross domestic product, GDP, is also expected to be a little higher. At the same time, the level of interest rates is lower.

The baseline scenario reflects how the Danish economy is slowly emerging from the recession. GDP growth has been positive for the last year, and this tendency is expected to continue over the forecast period, cf. Chart 2. Growth has primarily been driven by inventory investments, but private and public consumption have also made positive contributions.

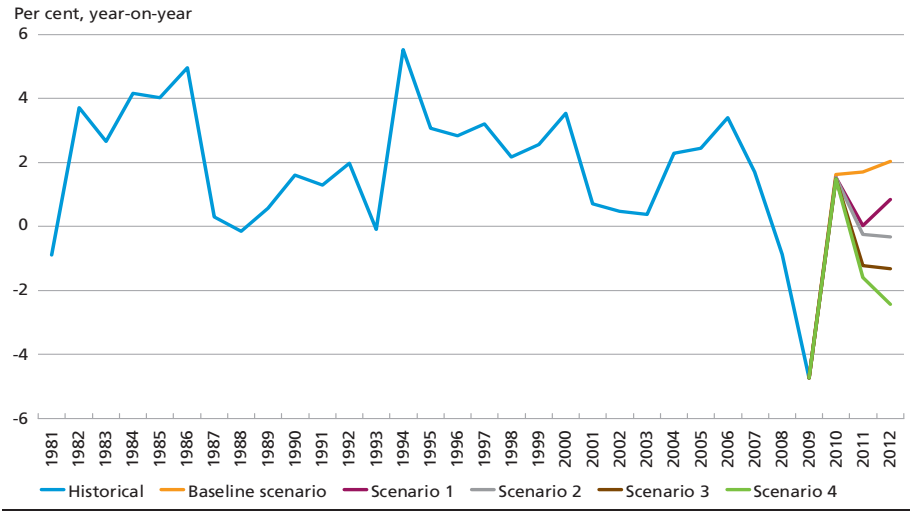
In the baseline scenario, unemployment is expected to decline during 2011, cf. Chart 3. Housing prices are expected to stabilise around the current level in the forecast period.

COMPARISON OF BASELINE SCENARIOS Table 1

	Stress Tests, 2nd Half 2010			Financial stability, 2010		
	2010	2011	2012	2010	2011	2012
GDP, per cent, year-on-year	1.6	1.7	2.0	1.3	1.7	1.9
Unemployment rate, per cent	4.0	4.2	3.8	5.3	5.8	5.4
Bond yield, per cent, p.a.	2.4	2.9	3.4	3.4	4.1	4.8
House prices, per cent, year-on-year .	1.5	1.5	2.0	0.6	1.8	1.8

Note: For a detailed description of the forecast, see Danmarks Nationalbank, *Monetary Review,* 3rd Quarter 2010.The baseline scenario in Financial stability 2010 is based on Danmarks Nationalbank's forecast from March 2010.
Source: Own calculations.

GROWTH IN REAL GDP Chart 2

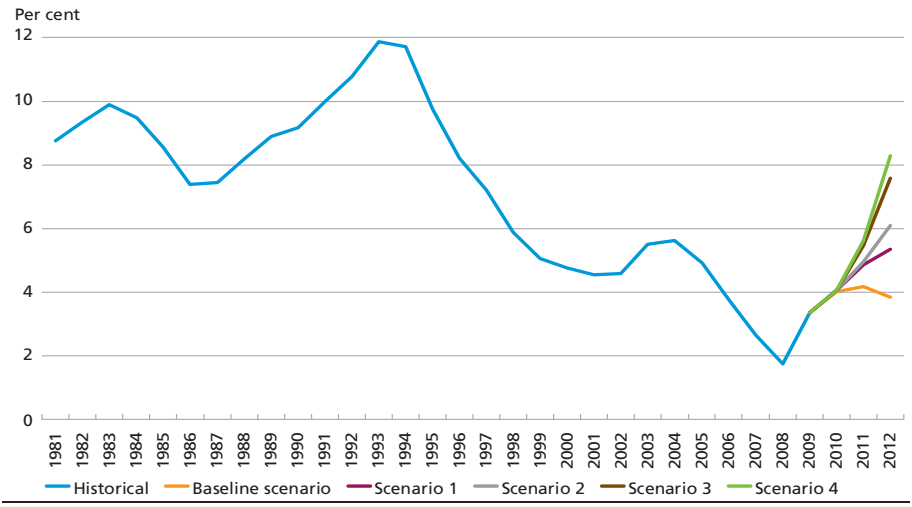


Source: Statistics Denmark and own calculations.

Stress scenarios

To test the financial sector's robustness to adverse shocks to the economy, the baseline scenario is supplemented with four stress scenarios. The stress scenarios have been developed in cooperation with the Danish Financial Supervisory Authority. These scenarios illustrate various risk elements in the economy: a negative Danish housing price scenario, a negative international interest-rate scenario, an international low-growth scenario, and a scenario in which more pronounced international low growth is combined with a strong increase in interest rates.

UNEMPLOYMENT Chart 3



Source: Statistics Denmark and own calculations.

Developments in 2010 are practically identical in all scenarios. The reason is that there is not really time for the shocks to the macroeconomic development to have a significant impact. The macroeconomic developments in the baseline scenario and the four stress scenarios are specified in Appendix 1.

Scenario 1: Housing price scenario
This scenario reflects a financial crisis and confidence crisis in the Danish economy with a sharp fall in housing prices. The level of interest rates and developments abroad are expected to be in line with the baseline scenario. The scenario involves an exogenous shock to housing prices, making them fall more rapidly than the macroeconomic development as such would warrant. This means that the impact on housing prices is particularly strong, but private consumption and private investments also experience negative shocks. In this scenario, unemployment rises to 5.3 per cent by end-2012, and housing prices drop by more than 20 per cent over the same period, cf. Table 2.

Scenario 2: Interest-rate scenario
The domestic crisis in scenario 1 is combined with an international debt crisis. The debt crisis entails that the average bond yield gradually increases, to a level in 2011-12 that is approximately 2.5-3 percentage points per annum higher than in the baseline scenario. Export market growth is reduced relative to the baseline scenario as the debt crisis and the higher interest rates are assumed to reduce investment appetite and private consumption abroad. Unemployment rises to 6.1 per cent by 2012, and housing prices drop by almost 25 per cent over the same period, cf. Table 3.

Scenario 3: Low-growth scenario
A domestic crisis is combined with an international recession scenario and a resultant slowdown in the export market. Average bond yields decline slightly from the current very low level. Unemployment rises to 7.6 per cent by 2012, and housing prices decline by more than 10 per cent over the same period. GDP growth is negative in both 2011 and 2012, cf. Table 4.

Scenario 4: Low-growth and interest-rate scenario
Scenario 4 combines an international debt crisis (scenario 2) with low growth (scenario 3). The export market contracts a bit more than in scenario 3, while long-term interest rates rise a little less than in scenario 2. This assumption reflects how, other things being equal, lower activity dampens the rise in interest rates. Nevertheless, interest rates are substantially higher than in scenario 3 and are expected to curb international growth further. Unemployment rises to 8.3 per cent by end-2012, and housing prices decline by more than 25 per cent over the same period. GDP growth is negative in both 2011 and 2012, cf. Table 5.

SELECTED MACROECONOMIC VARIABLES IN SCENARIO 1 Table 2

	2010	2011	2012
GDP, per cent, year-on-year	1.5	0.0	0.8
Unemployment rate, per cent	4.1	4.8	5.3
Bond yield, per cent, p.a.	2.7	2.9	3.4
House prices, per cent, year-on-year	-0.0	-13.7	-8.5

Source: Own calculations.

SELECTED MACROECONOMIC VARIABLES IN SCENARIO 2 Table 3

	2010	2011	2012
GDP, per cent, year-on-year	1.5	-0.3	-0.3
Unemployment rate, per cent	4.1	5.0	6.1
Bond yield, per cent, p.a.	2.9	5.4	6.5
House prices, per cent, year-on-year	0.2	-14.6	-11.1

Source: Own calculations.

SELECTED MACROECONOMIC VARIABLES IN SCENARIO 3 Table 4

	2010	2011	2012
GDP, per cent, year-on-year	1.5	-1.2	-1.3
Unemployment rate, per cent	4.1	5.5	7.6
Bond yield, per cent, p.a.	2.6	2.2	2.2
House prices, per cent, year-on-year	0.8	-6.1	-6.9

Source: Own calculations.

SELECTED MACROECONOMIC VARIABLES IN SCENARIO 4 Tabel 5

	2010	2011	2012
GDP, per cent, year-on-year	1.5	-1.6	-2.4
Unemployment rate, per cent	4.1	5.6	8.3
Bond yield, per cent, p.a.	2.8	5.1	6.1
House prices, per cent, year-on-year	0.3	-14.3	-14.6

Source: Own calculations.

RESULTS

The banks' income statements and balance sheets are projected by the estimated development in earnings and write-downs. The robustness of the sector is assessed on the basis of developments in the banks' capitalisation. In the summer of 2010, the Committee of European Banking Supervisors, CEBS, performed a joint stress test of the largest European banks.[1] CEBS set a threshold of 6 per cent for tier 1 capital, which was somewhat higher than the statutory minimum of 4 per cent. Below, the results of Danmarks Nationalbank's stress tests are compared with both the statutory minimum and the threshold value applied in the international stress test.

The banks' earnings

Net interest and fee income was high in the 1st half of 2010. For the full year 2010 and the rest of the projection period, the largest banks are also expected to post high earnings. In scenarios 2 and 4 earnings grow further, as net interest income increases as a result of the rising interest rates.

Payments to Bank Rescue Package I ceased at 30 September 2010, which has a positive impact on earnings.[2] The banks' earnings are not significantly affected by value adjustment of securities in any of the scenarios.[3] To some extent, high earnings serve as a buffer against write-downs on lending.

The banks' write-downs

The level of write-downs is of crucial importance to the banks' overall financial performance. At 1.9 per cent, write-downs in 2009 were at the highest level since the Nordic banking crisis in the early 1990s. Both in the baseline scenario and in the stress scenarios, write-downs will be lower in 2010 than in 2009. This is because the shocks that are assumed to materialise in the 4th quarter will not have time to seriously affect the write-downs for the year.

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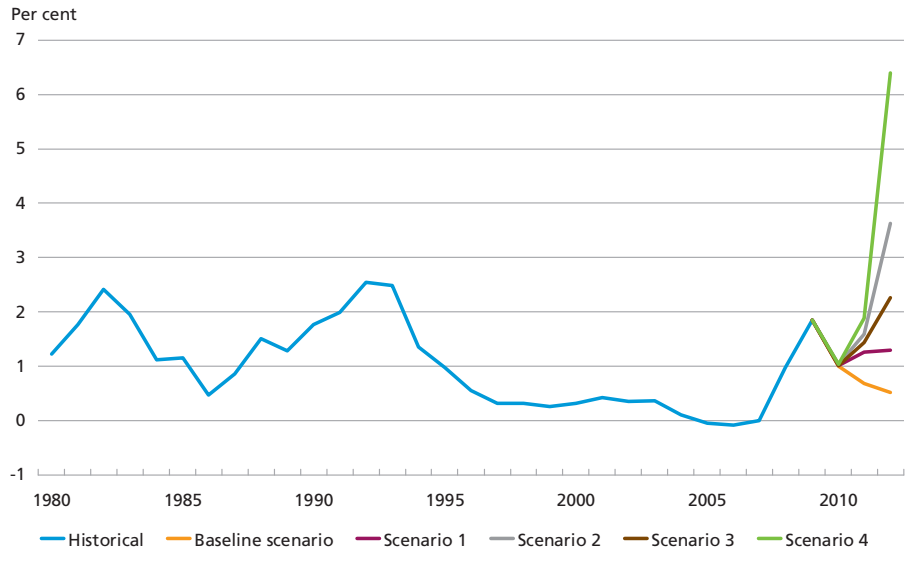
1 For further information about the CEBS stress test, see International Stress Tests, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2010. From Denmark, Danske Bank, Jyske Bank and Sydbank participated. All three Danish banks passed the stress test with tier 1 capital well in excess of the threshold of 6 per cent set by CEBS. Nordea Bank Danmark was included via its Swedish parent company, Nordea Bank AB.

2 Following the expiry of Bank Rescue Package I on 30 September 2010, banks are once again allowed to pay out dividends. The stress test model assumes that no dividends are paid out. Furthermore, it is assumed that the banks that have received government capital injections under the Credit Package will pay 10 per cent per annum in interest on this capital. No explicit assumptions have been made regarding payments relating to government-guaranteed issues as these are simply assumed to replace other funding.

3 The stress test of market risk in terms of interest-rate and exchange-rate risk is based on banks' reporting of overall data for interest-rate sensitivity and net exchange-rate exposure. This means that only part of the banks' market risk is included in the stress test; for example, risks in relation to changes in interest-rate spreads and market liquidity are not included.

AGGREGATE WRITE-DOWNS Chart 4



Note: Weighted averages. The 2010 observation is determined by the observed write-downs in the first half of the year and the estimated write-downs in the second half.
Source: Baldvinsson et al. (2005), *Danish Banks,* 5th edition, Forlaget Thomson, Danish Financial Supervisory Authority and own calculations.

In the baseline scenario, the write-down ratios decline throughout the projection period as the economy improves, while in the stress scenarios the negative economic development is clearly reflected in the write-down ratios in 2011-12, cf. Chart 4 and Box 1.

In scenario 1, the write-down ratios rise over the projection period, but remain below the level observed in 2009. Write-downs increase for all sectors. In scenario 2, the write-down ratios reach a historically high level at the end of the period compared with the observed level, cf. Chart 4. This development is mainly driven by very high write-downs in sectors that have historically been very volatile to changes in interest rates.[1] Write-downs in scenario 3 rise to a level corresponding to that seen during the banking crisis in the early 1990s. In the final scenario, the combined scenario, write-down ratios are more than twice as high as during the banking crisis in the early 1990s. This is attributable to the combination of large falls in housing prices, negative GDP growth and high interest rates. The level of write-downs may seem high, but it is not unseen in an international context.

[1] Particularly agriculture; credit, finance and insurance; property administration, purchase and sale, and business services; and retail customers.

CREDIT RISK IN THE STRESS TESTS Box 1

The stress test models the banks' write-downs in the event of plausible, but very unlikely negative shocks to the economy. Hence there are not always historical observations that match the modelled stress scenario. The expected levels of write-downs for the various sectors are determined by macroeconomic developments in the various scenarios on the basis of historical relations between macrovariables and write-downs. At the level of the individual banks, write-downs are determined by the banks' exposures to the sectors in question.

Several of the scenarios operate with very large write-downs towards the end of the period. Particularly in scenario 4 the write-downs reach levels far in excess of the historical levels in the period 1994-2009. However, it should be borne in mind that the combination of high interest rates and low growth is considerably more severe than observed in that period. The level of write-downs may seem high, but it is not unseen in an international context.

It is important to remember that the stress tests show an expected result of a given macroeconomic development without any response from the authorities. Especially in scenario 4 the economy is severely affected in 2012 following several bad years in which the value of the banks' collateral has declined strongly. If the economy develops as envisaged in this scenario, and the authorities do not react, several banks will fold. With the expiry of the general government guarantee, large depositors, including banks, may suffer losses in connection with distressed banks.

The banks' capitalisation

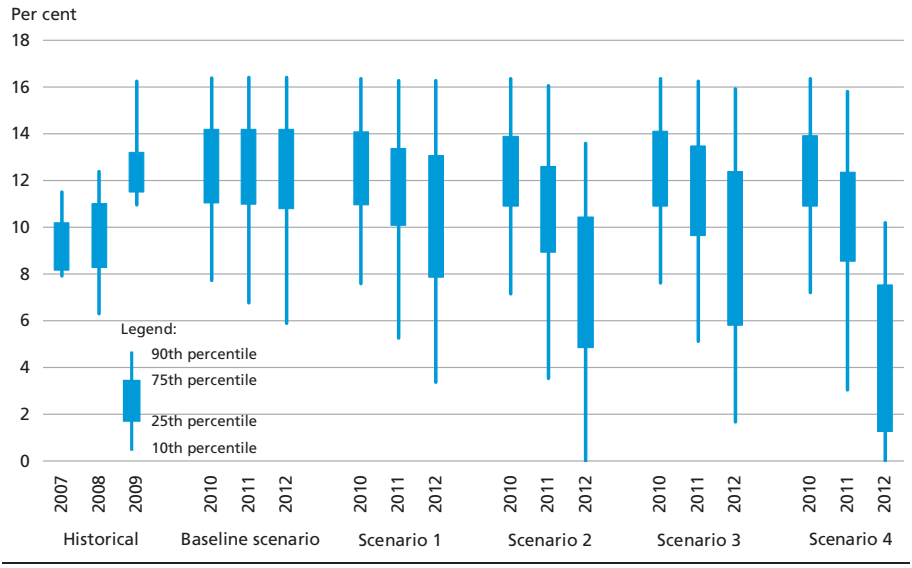
During the financial crisis the banks have focused on strengthening their capitalisation. A pronounced improvement was seen in 2009. This is attributable to factors such as government injections of hybrid core capital under the Credit Package and fresh capital from the market. The government capital injections are intended to be temporary, cf. Box 3, page 17.

One of the statutory capital requirements is that tier 1 capital must constitute at least 4 per cent of a bank's risk-weighted assets. The minimum requirement for the capital base is the bank's individual capital need or 8 per cent of the risk-weighted assets, whichever is higher. The Danish Financial Supervisory Authority may impose a higher requirement, which means that the tier 1 requirement also increases as tier 1 must constitute at least 50 per cent of the total capital base.

The banks included in the stress tests have a high tier 1 ratio at the starting point, cf. Chart 5. Most of the banks will not encounter problems in relation to meeting the current threshold of 4 per cent for tier 1 capital in the baseline scenario or any of the stress scenarios. However, if the CEBS threshold of 6 per cent is applied, several banks will be struggling.

The Danish Financial Supervisory Authority must withdraw a bank's licence to conduct financial activities if the bank does not meet the statutory requirement for a sufficient capital base. The difference between the actual solvency ratio and the bank's individual capital need is a capital

TIER 1 RATIOS Chart 5



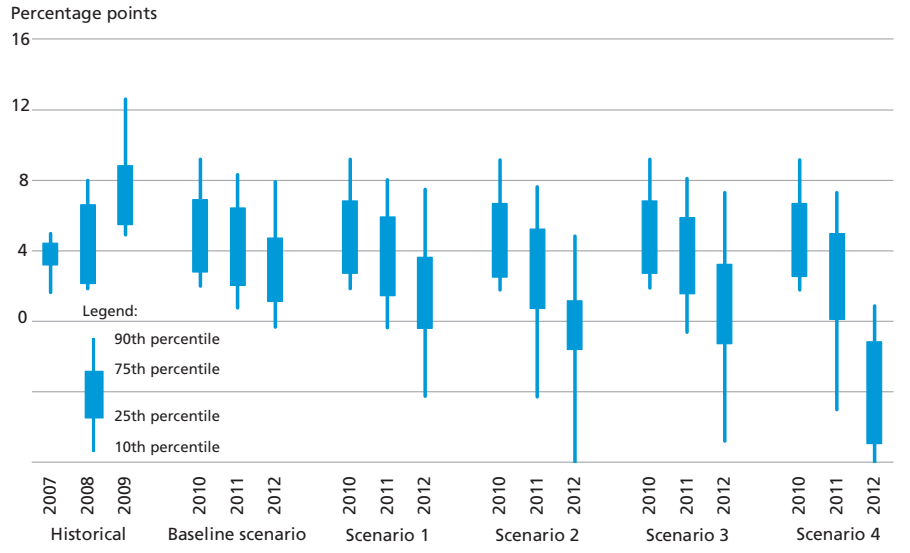
Note: Several of the banks analysed are subsidiaries in large financial groups. These subsidiary banks may have low excess capital adequacy since most of the capital is typically held by the parent company. Consequently, they do not perform well in the stress tests. How vulnerable the subsidiaries actually are will depend on the financial strength of the parent company and its ability to provide financial support if required. Since it is uncertain to which extent the parent company, which is also expected to be affected by the stress scenario, will be able to support the subsidiary, the stress tests do not take this possibility into account.
Source: Danish Financial Supervisory Authority and own calculations.

buffer, the excess capital adequacy. The greater the excess capital adequacy, the more resilient the bank is to future losses. If the excess capital adequacy turns negative, the bank no longer meets the statutory requirement.

Measured in terms of excess capital adequacy the banks overall seem to be sufficiently well-capitalised to withstand the most probable economic development in the baseline scenario, cf. Chart 6. In scenario 1, most banks manage to get through the projection period, although some will post negative results in one or more years. In scenarios 2 and 3, most of the banks post negative results, and several of them will no longer be able to meet their individual capital needs towards the end of the projection period. In scenario 4, all banks are severely affected by large write-downs and adverse economic conditions, and the majority by far of banks will have problems meeting the capital requirement.[1] In the opinion of Danmarks Nationalbank the banks should therefore continue to consolidate and strengthen their capitalisation and prepare for the forthcoming regulation and repayment of any government capital injections from 2012 onwards, cf. the section below.

[1] For an elaboration of the principles behind the dynamics in the banks' capital in the event of losses, see Box 17 of *Financial stability*, 1st Half 2009.

EXCESS CAPITAL ADEQUACY Chart 6



Note: Excess capital adequacy is calculated as the difference between the actual capital base and the individual capital need as a percentage of risk-weighted assets.
Source: Danish Financial Supervisory Authority and own calculations.

Tighter capital requirements in the future

Based on proposals from the Basel Committee, a number of tightening measures are being prepared in relation to capital, cf. Box 2. These proposals include improving the quality of the banks' capital. As a result, focus is expected to shift from the capital base to tier 1, particularly non-hybrid core capital.

NEW CAPITAL-ADEQUACY RULES UNDER BASEL III Box 2

On 12 September 2010, the Basel Committee tabled a number of proposals to strengthen the capital base of banks. The proposal envisages gradual implementation over the period 2013-18.

It is proposed to raise the minimum requirement for non-hybrid tier 1 capital (common equity), i.e. capital of the highest quality, from the current 2 per cent to 4.5 per cent of risk-weighted assets. The minimum requirement for tier 1 capital will increase to 6 per cent, while the total capital requirement remains at 8 per cent. In addition to these minimum requirements, the banks must hold capital conservation buffers of 2.5 per cent; if they fail to do so, dividend distribution restrictions will apply. Hence, the total requirement is 7 per cent common equity, 8.5 per cent tier 1 capital and 10.5 per cent total capital if the bank is to meet the capital requirement and have a sufficient capital conservation buffer. In addition, a countercyclical capital buffer is proposed, which may vary from 0 to 2.5 per cent of risk-weighted assets, depending on the cyclical position of the economy.

The new capital requirements are expected to be implemented during the period 2013-18, i.e. after the scenarios forecast in this publication. Presumably the market will expect banks to begin to observe the coming rules at an earlier stage. As mentioned above, the tier 1 ratio of the

INCENTIVES TO REDEEM GOVERNMENT CAPITAL INJECTIONS Box 3

The Credit Package was adopted in February 2009, and the capital was injected by end-2009. Government capital injections into credit institutions under the Credit Package have been aimed at preventing business enterprises and consumers from ending in a credit squeeze, i.e. being unable to borrow money for sound projects.[1]

The injected capital of kr. 46 billion is in the form of hybrid core capital. Under the provisions of the Credit Package, the government capital injection has no expiry date. With the permission of the Danish Financial Supervisory Authority, the capital may be redeemed after three years at the earliest, i.e. from 2012. This assumes that the debt is replaced by paid-up tier 1 capital of at least the same quality, or that the tier 1 capital after redemption constitutes at least 12 per cent of the risk-weighted assets.

In addition, the Credit Package was designed to give the credit institutions specific redemption incentives in that the redemption price is stepped up. The capital can be redeemed at par during the first five years, but in year six it must be redeemed at 105 per cent, and from the seventh year at 110 per cent. Hence the effective interest rate increases and it becomes more expensive for credit institutions to redeem the debt from 2014 and even more expensive from 2015.

Credit institutions pay an individually determined interest rate. The average effective interest rate[2] payable by the 43 institutions that have received government capital injections is 10.08 per cent. The rate of interest may rise if large dividends are distributed.

Credit institutions are also subject to other requirements while they have government capital injections, including restrictions on remuneration. These requirements also provide an incentive to redeem the government capital.

The Basel III rules will provide a further incentive for the banks to redeem the capital. Under the present rules, government capital injections can be included, in part or in full, in the bank's tier 1 capital until 1 January 2040, irrespective of any redemption incentive. Under the Basel Committee's proposal[3], capital that gives the issuer a redemption incentive may not be included in the calculation of solvency. Government capital injections with redemption incentives may, however, be included during a transitional period until January 2018.[4]

Overall, the general financing conditions and the strength of the individual credit institution will have an impact on whether the credit institution will be able to replace the government capital injection by private-sector capital of a better quality. The new capital can be expected to be of a better quality, as it will have to meet the Basel III criteria, including that it will be without redemption incentives. Another option available to the credit institutions is to increase tier 1 capital by transferring all or some of the profit to equity.

[1] Press release from the Ministry of Economic and Business Affairs, 18 January 2009.
[2] Weighted average.
[3] Basel Committee on Banking Supervision, 17 December 2009: Strengthening reliance of the banking sector.
[4] Basel Committee on Banking Supervision, 12 September 2010: Press release: Group of Governors and Head of Supervision announces higher global minimum capital standards.

banks is high at the starting point. Consequently, most Danish banks will be able to comply with the proposed requirements in the baseline scenario. In the stress scenarios, many banks will be unable to meet the new requirements towards the end of the forecast period.

Besides preparing for the forthcoming regulation, the banks should prepare to repay their government loans, if any. The terms and conditions for repayment are described in Box 3.

The Banks' Liquidity

Overall, the liquidity of the Danish banks has improved since the trough during the financial crisis. The customer funding gap has narrowed, and dependence on financing from credit institutions has declined, while a higher level of bond financing has gone hand in hand with longer average maturities. This indicates that the banks are acquiring more stable financing and increasing their excess liquidity cover in line with the forthcoming international regulation. Danmarks Nationalbank's and the Danish Financial Supervisory Authority's stress tests of the banks' liquidity show that most banks are resilient to a prolonged period of stress, while some remain vulnerable.

Nevertheless, there are still considerable challenges. In the opinion of Danmarks Nationalbank, the liquidity position of the sector overall is not as strong as before the banks' expansion of their balance sheets gained momentum in 2004. Moreover, part of the current improvement is attributable to government-guaranteed issuances expiring in 2012-13. The banks must therefore prepare to obtain financing without government guarantees, while retaining the current positive development trends in the form of more long-term issuances and reduced financing from credit institutions. Debt financing in the short-term maturity segment is still primarily in dollars. Looking ahead, Danmarks Nationalbank finds it important to reduce dependence on individual markets that may be difficult to access in periods of stress.

INTRODUCTION

Lending by banks typically involves commitments with longer maturities than their financing by way of deposits and borrowing in the financial markets. Consequently, financing must be renewed on a regular basis, or new financing must be obtained. Difficulties in procuring new financing may entail large losses when assets are liquidated and may, in the worst case, lead to the closure of a bank. The risk of liquidity problems is therefore a key aspect of the banks' overall risk profile.

This chapter sheds light on the banks' liquidity and their vulnerability to liquidity problems[1], thereby supplementing the stress test of the

[1] For an elaboration on liquidity risk, see Anne-Sofie Reng Rasmussen, Banks' Liquidity Management, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2010.

banks' capitalisation in the preceding chapter. Unless otherwise indicated, the banks in the analysis belong to the Danish Financial Supervisory Authority's groups 1, 2 and 3 at the beginning of January 2010.

The customer funding gap, defined as the difference between customer loans and deposits, is an indicator of the extent to which banks need to source financing by borrowing in the financial markets or from other credit institutions. For a number of years, the group 1 banks taken as one have posted a customer funding surplus in their Danish operations, but a substantial aggregate customer funding gap when foreign branches are included. Banks in groups 2 and 3 have had a considerable customer funding gap relative to their size. This customer funding gap was built up in the period leading up to the financial crisis. Since then it has declined, but there is still some way before balance is achieved between deposits and lending, as most recently observed in 2005. The aggregate data covers large fluctuations within the groups, and a relatively large customer funding gap could make the individual bank vulnerable to continued access to borrowing in the financial markets or from other credit institutions.

However, a customer funding gap could indicate that a bank is able to diversify its financing base by obtaining stable, long-term financing in the financial markets. Whether this reduces the risk of liquidity problems depends on the specific characteristics of the financing obtained. For example, time deposits may be of a more temporary nature than long-term bond financing.

In the years preceding the financial crisis, financing from credit institutions gained ground, but during the crisis this type of financing proved to be very elusive and thus inexpedient as a basis for ordinary banking activities on such a large scale. Since the crisis, the banks' dependence on this type of financing has decreased, while issuance of bonds has gained importance. The maturity of bonds has to a large extent been determined by the general government guarantee and the individual government guarantees.

Debt financing in the short-term maturity segment is still predominantly in dollars. Looking ahead, Danmarks Nationalbank finds it important to reduce dependence on individual markets that may be difficult to access in periods of stress.

As part of Danmarks Nationalbank's and the Danish Financial Supervisory Authority's intensified oversight of banks' liquidity, the banks prepare and submit liquidity stress tests on a monthly basis. The most recent stress tests show that most institutions are well-cushioned for a prolonged period of stress. Some banks remain vulnerable, however.

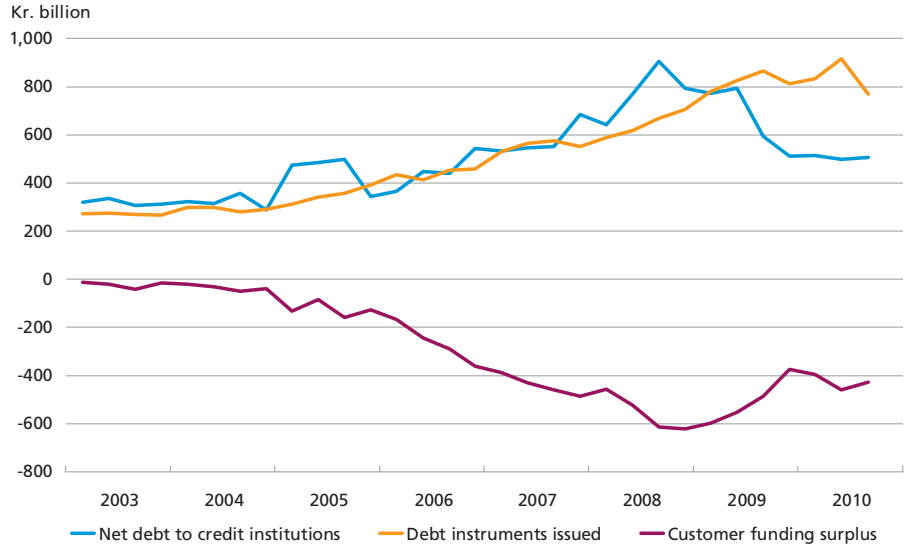
THE BANKS' CUSTOMER FUNDING GAP

The Danish banks' customer funding gap, defined as lending less deposits in relation to retail and corporate customers, increased from 2003 to end-2008, cf. Chart 7. The customer funding gap is a measure of whether the banks' deposits alone are sufficient to cover their funding requirements, or whether they need to borrow from other credit institutions or issue debt instruments. The increase reflects pronounced growth in lending by banks, while deposits have grown at a slower pace. Over the same period, both net debt to credit institutions and the volume of debt instruments issued rose, indicating that both types of borrowing in the financial markets were used to finance the growing customer funding gap.

From end-2008 to end-2009, the customer funding gap shrank considerably, primarily due to reduced lending, and since then it has been relatively stable. At the same time, net debt to credit institutions also declined, while the volume of debt instruments issued continued to rise until mid-2010.

If adjustment is made for the banks' repo activities, this provides a better view of the structural development in the customer funding gap,

THE BANKS' CUSTOMER FUNDING SURPLUS, NET DEBT TO OTHER CREDIT INSTITUTIONS AND OUTSTANDING DEBT INSTRUMENTS — Chart 7



Note: Observations from March 2003 to September 2010. Lending has been stated before write-downs. Quarterly data.
Source: Danmarks Nationalbank.

REPO DEPOSITS AND LOANS — Box 4

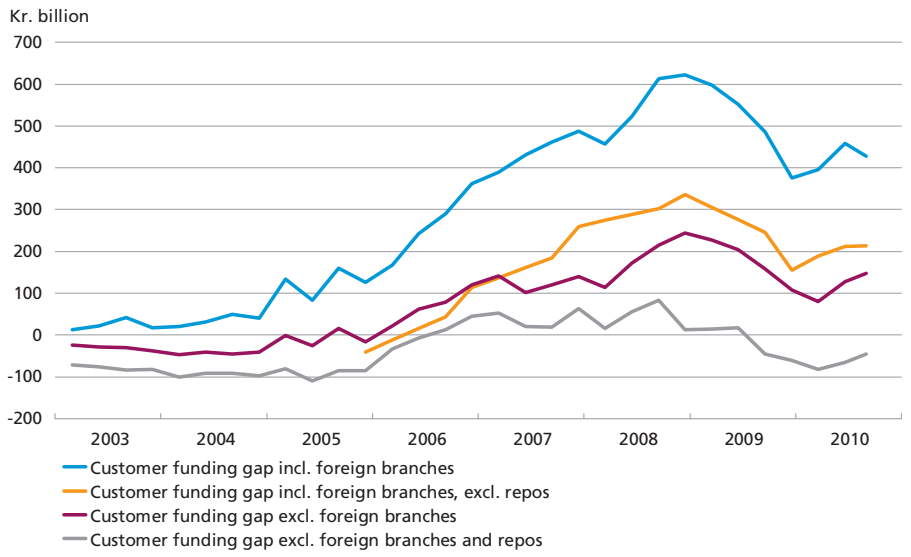
A repo deposit involves selling a security for repurchase at an agreed later date. The amount received on sale of the security when concluding the repo is booked as a repo deposit. A repo loan is a reverse transaction, i.e. the bank purchases a security for later resale. In this case, the payment for the security is booked as a repo loan against the security as collateral.

Repo transactions vary in volume and generally fluctuate more than ordinary deposits and lending, one reason being that the motivation for concluding agreements is often a wish to take positions in securities rather than actual deposit and lending activities. At the end of the 2nd half of 2010, repo deposits and loans constitute 7 per cent of the banks' deposits and 17 per cent of total loans, respectively. Consequently, the customer funding gap shrinks considerably when stated exclusive of repo activities, cf. Chart 8. Since repo loans are provided against securities as collateral, the need for financing the repo loan by way of stable deposits is lower than for ordinary lending, provided that the value of the collateral still matches the value of the loan at the time of resale. This circumstance and the fluctuations in repo loans mean that the customer funding gap stated exclusive of repo transactions gives a better view of structural developments in the customer funding gap.

[1] See executive order on financial reports for credit institutions and investment companies etc.

cf. Box 4. The customer funding gap adjusted for repo activities is somewhat lower than the non-adjusted gap, but remains wide cf. Chart 8.

CUSTOMER FUNDING GAP — Chart 8



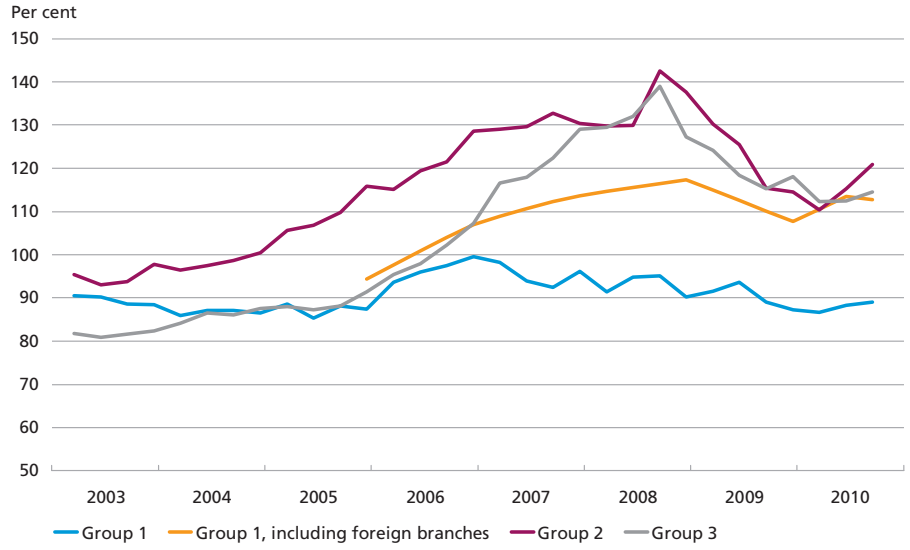
Note: Repo transactions for foreign branches have been linearly interpolated. Lending has been stated before write-downs. Quarterly data.
Source: Danish Financial Supervisory Authority, Danmarks Nationalbank, liquidity reporting and financial statements.

The customer funding gap is to a large extent driven by customer funding gaps in foreign branches of Danish banks, where lending has grown strongly without a corresponding rise in deposits. If the foreign branches and repoactivities are eliminated from the customer funding gap, the increase in 2003-08 is lower, and the lending and deposits of the banks' Danish operations balance in 2010, cf. Chart 8. The banks' need to procure financing in the financial markets is determined by both their domestic and their foreign operations, so this calculation should not be seen as an indication of reduced liquidity risk. A breakdown of the customer funding gap shows that the widening gap in the period 2003-08 is not merely attributable to strong lending growth in Denmark.

The aggregate customer funding gap is to a large extent driven by the group 1 banks' deposits and lending, given their relative size. Chart 9 illustrates developments at group level. The Chart states the banks' lending ratios, i.e. lending relative to deposits. A lending ratio in excess of 100 per cent is equal to a customer funding gap. Among group 1 banks, the Danish operations have shown constant small customer funding surpluses since 2003, while group 1 including foreign branches has posted a considerable customer funding gap.

LENDING RATIO EXCLUSIVE OF FOREIGN BRANCHES AND REPO TRANSACTIONS

Chart 9



Note: 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 has been calculated on the basis of the total deposit and lending volumes of the respective groups of banks. Repo transactions for foreign branches have been linearly interpolated. Lending has been stated before write-downs. Quarterly data.

Source: Danish Financial Supervisory Authority, Danmarks Nationalbank, liquidity reporting and financial statements.

For groups 2 and 3, the pattern is rather different. From being on a level with group 1 in 2003, the lending ratios of these two groups, and thus their customer funding gaps, rose strongly until September 2008. Since then they have declined somewhat, but remain well above the level seen before the banks began to expand their balance sheets in 2004. The most recent widening in group 2 is attributable to widening of individual banks' customer funding gaps, cf. Chart 2 in Appendix 2.

In absolute terms, the customer funding gap of groups 2 and 3 totalled kr. 60 billion at end-September 2010. If banks managed by the Financial Stability Company are omitted, the gap was kr. 40 billion. This is a small share of the total customer funding gap, but not inconsiderable relative to the lending volume of groups 2 and 3 and their opportunities to source market-based financing.

It should be emphasised that the aggregate customer funding gaps of group 1 and group 2 and 3, respectively, mask considerable divergence, some banks having customer funding surpluses, while others have substantial gaps, cf. Charts 1, 2 and 3 in Appendix 2.

THE STABILITY OF THE BANKS' FINANCING

From a liquidity perspective it is desirable that a bank's financing is stable and changes predictable, irrespective of the source of financing – deposits, debt to other credit institutions or issuance of debt instruments. Whether the customer funding gap increases or reduces the banks' liquidity risk therefore depends on the specific characteristics of the deposits and debt instruments, e.g. maturities, counterparty characteristics, etc.

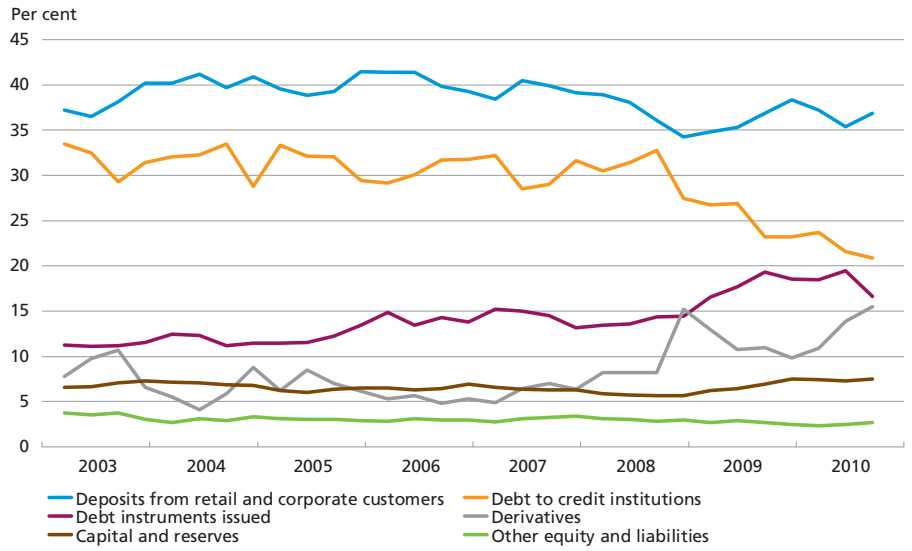
The financing structure of the banks is described in more detail below. In the 3rd quarter of 2010, deposits from retail and corporate customers constituted 37 per cent of the balance-sheet total, debt to credit institutions constituted 21 per cent, and debt instruments issued constituted 17 per cent, cf. Chart 10.

Deposits from retail and corporate customers

Deposits from retail and corporate customers have traditionally been seen as a stable source of financing. However, that is not necessarily the case for the individual bank. During the financial crisis, Icelandic Landsbanki thus found that its volume of internet-based deposits shrank when the soundness of the bank was called into question.

The stability of deposits depends on a number of factors, including whether the depositor has other business with the bank, the depositor's characteristics, whether the deposit is covered by a deposit guarantee

COMPOSITION OF THE BANKS' EQUITY AND LIABILITIES Chart 10



Note: Lending has been stated before write-downs. Quarterly data.
Source: Danmarks Nationalbank.

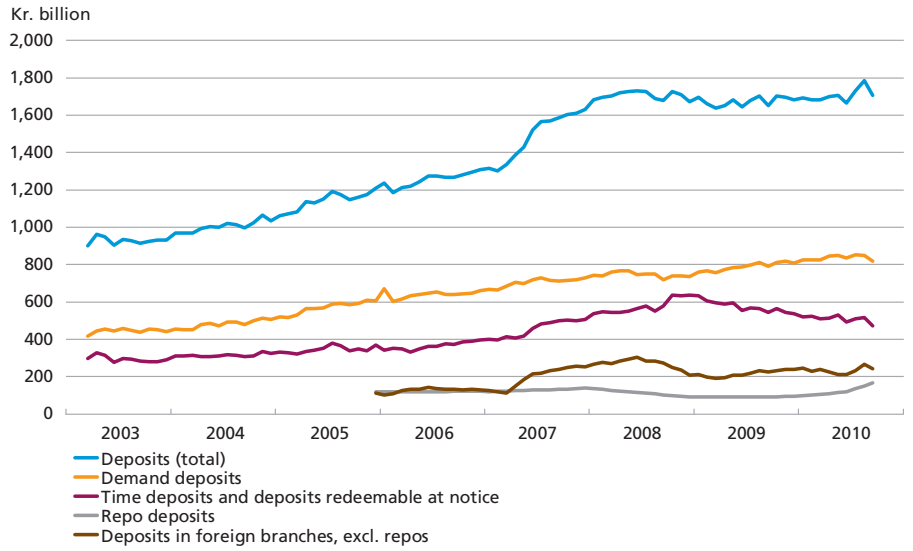
scheme[1], the deposit type, etc. In addition, the more fiercely the banks are competing for deposits, the less stable this source of financing is. Depositors that choose their bank on the basis of the interest rates offered are quick to move their funds if it is more profitable or less risky to bank elsewhere.

Deposits from retail and corporate customers have made up a relatively stable share of the banks' liabilities, cf. Chart 10, and deposits increased in absolute terms until end-2007, but have subsequently stagnated, cf. Chart 11. Just under half of the total deposits are covered by the deposit guarantee scheme. These deposits can be expected to be more stable in the event of uncertainty about a bank's solvency.

Deposits that are tied for a certain period, i.e. time deposits and deposits redeemable at notice, increased until mid-2008, but have declined since then. In the short term, these deposits can be seen as stable since there is a strong incentive not to withdraw them prematurely. However, particularly time deposits may be transient with a certain lag as they are typically highly price sensitive, and depositors regularly consider whether they should be renewed. Demand deposits have risen steadily since 2003. Such deposits can be withdrawn without notice, but on the other hand they are often less price sensitive and thus more stable in the long term than time deposits.

[1] The Danish deposit guarantee scheme was amended from 1 October 2010 and now covers net deposits of up to 100,000 euro.

DEPOSITS FROM RETAIL AND CORPORATE CUSTOMERS BY TYPE Chart 11



Note: Deposits in foreign branches have been linearly interpolated in non-quarter months.
Source: Danmarks Nationalbank, Danish Financial Supervisory Authority, liquidity reporting and financial statements.

In the proposed new liquidity standards from the Basel Committee, deposits are generally deemed to be a relatively stable source of financing. A distinction is, however, made between various types of deposits with different outflow profiles. The less stable the deposits are assessed to be, the greater the expected outflow in the event of stress, cf. Box 5.

Debt to credit institutions

Debt to credit institutions has fallen from around 30 per cent in the period from 2003 to September 2008 to 21 per cent of the banks' balance-sheet total in 2010, cf. Chart 10. This to a large extent reflects developments among group 1 banks. Groups 2 and 3 tended to rely increasingly on loans from credit institutions in the period leading up to the financial crisis. Thus, debt to credit institutions as a share of equity and liabilities rose from around 15 per cent in 2003 to 30 per cent in September 2008. During the financial crisis interbank confidence decreased, reducing, even after the introduction of the government guarantee, the propensity to place funds with other credit institutions. In September 2008, the spread between collateralised and uncollateralised money-market interest rates thus widened notably, cf. Chart 12, indicating that confidence among banks declined in this period. Subsequently, the spread has narrowed, to a large extent due to the government guarantees, but remains above the level seen before mid-2007 when the first signs of financial market tensions were seen.

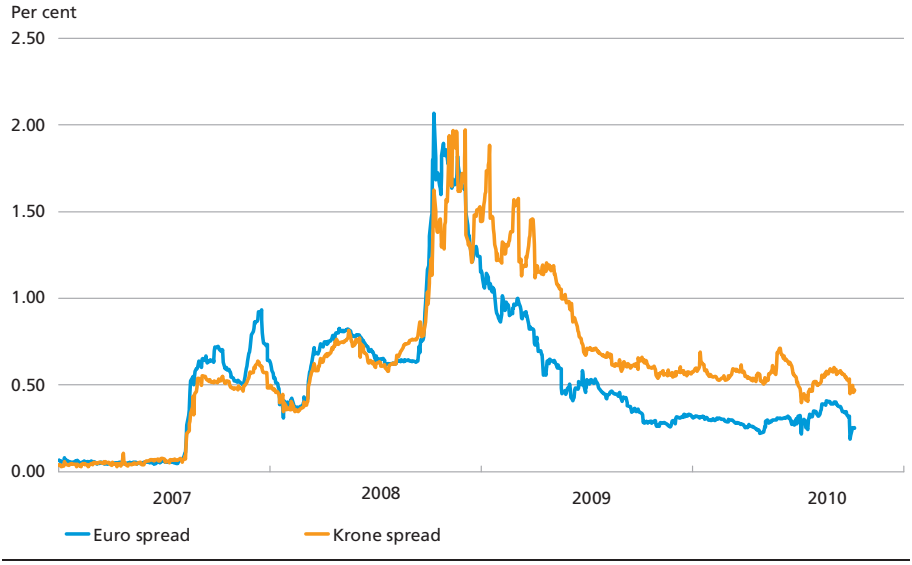
PROPOSED NEW INTERNATIONAL LIQUIDITY REQUIREMENTS Box 5

The Basel Committee has proposed two quantitative liquidity ratios:

- **Liquidity Coverage Ratio**: This ratio relates to the credit institutions' liquidity buffers. It indicates the volume of unencumbered, high quality liquid assets that an institution must hold as a buffer against the net payments to be made by the institution in the event of intensive 30-day liquidity stress, based on a stress scenario determined by the Basel Committee. The volume of liquid assets to be held by each institution will thus depend on the liquidity risks faced by the institution. The ratio will encourage credit institutions to hold more highly liquid assets and also to reduce their dependence on short-term market-based financing. The Basel Committee envisages introducing this ratio as a minimum requirement in 2015.
- **Net Stable Funding Ratio**: This ratio relates to the credit institutions' long-term financing structures. It indicates the volume of stable sources of long-term funding used by an institution relative to the liquidity profile of the assets financed by the institution, as well as the potential liquidity withdrawals arising out of off-balance-sheet commitments and obligations. A minimum level of stable funding is laid down, which must be observed by the institution. Stable funding is defined as funding that can be expected to be stable over a 1-year horizon. In this context, issuance of long-term debt is assessed as being more stable than ordinary deposits from retail customers. As soon as a debt's term to maturity falls below 1 year, the debt is, however, regarded as less stable. This encourages credit institutions to prolong the general maturity of their market-based financing and to spread the maturity dates over time. The Basel Committee envisages introducing this ratio as a minimum requirement in 2018.

[1] See the Basel Committee on Banking Supervision, "International framework for liquidity risk measurement, standards and monitoring", 2009

SPREADS BETWEEN COLLATERALISED AND UNCOLLATERALISED 3-MONTH MONEY-MARKET INTEREST RATES Chart 12



Note: 5-day moving averages.
Source: Reuters EcoWin.

The financial crisis has shown that debt to credit institutions is a very volatile source of financing. It is not desirable for a bank to rely heavily on this type of financing for ordinary banking activities. Hence, the Basel Committee's proposal for new liquidity standards categorises debt to credit institutions as the least stable source of financing. Reducing dependence on this type of financing is in line with the forthcoming regulation and a step on the way to more stable financing.

It is important to emphasise that exchange of liquidity between credit institutions is a key element of a well-functioning money market for ensuring market-based distribution of liquidity and for supporting efficient monetary-policy transmission of Danmarks Nationalbank's interest-rate changes to the banks. At any given time, some banks have liquidity surpluses, while others may have short-term liquidity deficits.

Debt instruments issued

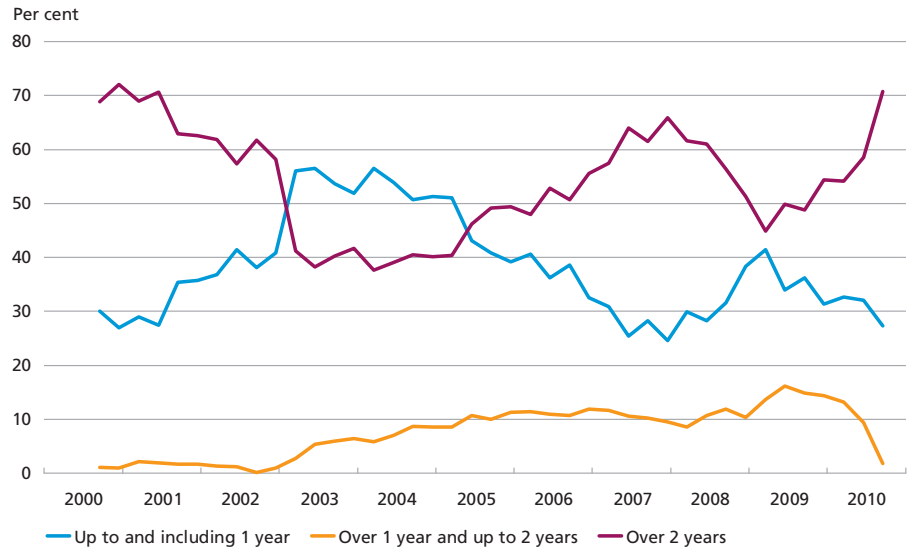
The wider customer funding gap was mainly offset by issuing more debt instruments, which increased from 11 per cent of the balance-sheet total in 2003 to 17 per cent in the 3rd quarter of 2010.

In the 3rd quarter of 2010, just over two thirds of the outstanding debt instruments had an original maturity of more than 2 years, cf. Chart 13. This share has been rising since March 2009, while the share of short-term money-market instruments has been declining over the same period. Debt instruments with long maturities are more stable than short-term instruments, which need to be refinanced more frequently.

One reason for the growing volume of new issuances is that, until 31 December 2010, the banks have the option to apply for permission to issue under individual government guarantees. At present commitments for individual government guarantees have been made to 57 credit institutions for a total of kr. 337 billion, and until now guarantees issued amount to kr. 191 billion, distributed on 51 credit institutions. All these instruments mature in 2012 or 2013 and have an original maturity of 3 years[1]. The sharp decline in issuances with an original maturity of 1-2 years in the 3rd quarter of 2010 reflects how the financial crisis led to extensive issuance of instruments maturing when the general government guarantee expired. Refinancing has presumably taken place in the period up to expiry, which would explain the temporary increase in the outstanding volume, cf. Chart 14.

[1] Including issuance by mortgage banks and Faroese banks, cf. the Financial Stability Company.

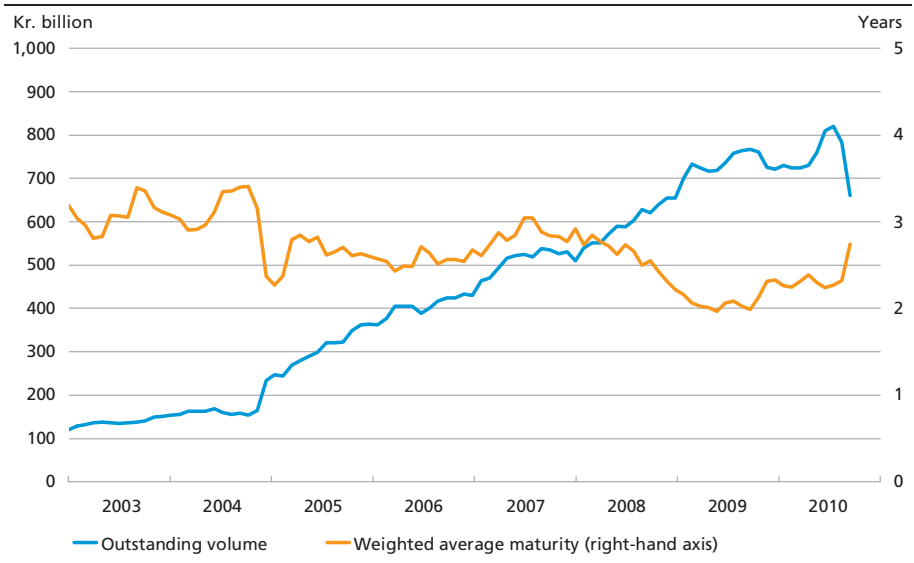
MATURITIES OF DEBT INSTRUMENTS ON ISSUANCE Chart 13



Note: Including foreign branches from the 1st quarter of 2003. Quarterly data.
Source: Danmarks Nationalbank.

Since 2009, the average term to maturity of the outstanding debt instruments has increased for group 1 and 2 banks, which further supports the impression that the banks have now sought to achieve longer maturities, cf. Chart 14.

OUTSTANDING DEBT INSTRUMENTS AND AVERAGE TERM TO MATURITY Chart 14



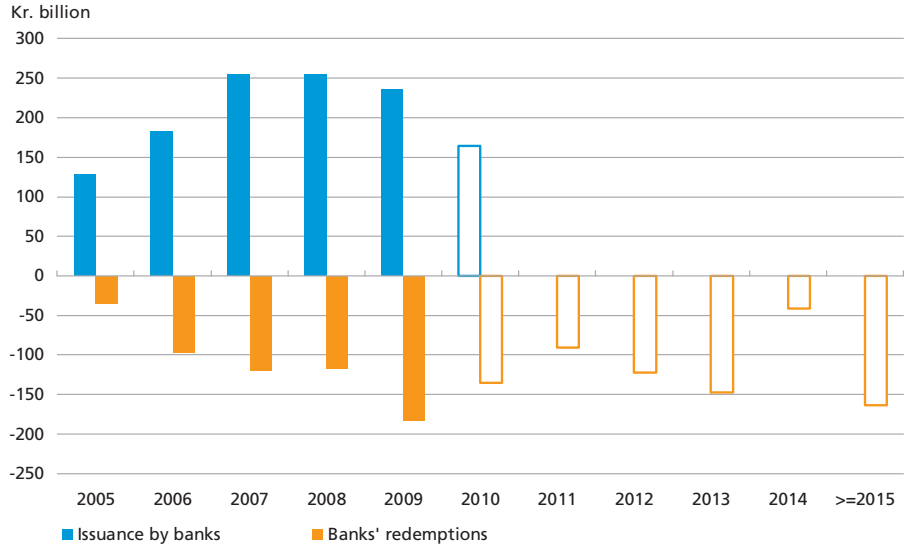
Note: Comprises banks in groups 1 and 2, excluding foreign branches. The statement only includes instruments with a fixed maturity date. Weighted averages.
Source: Danmarks Nationalbank.

The average term to maturity shortened when the banks' expansion of their balance sheets gained momentum in 2004, and this trend continued during the financial crisis. The reason was that many banks issued shorter loans maturing before the expiry of the general government guarantee, as they were unable to raise longer-term loans on market terms. The pronounced fall in the outstanding volume is thus set off by an increase in the average maturity at end-September 2010, when the general government guarantee expired and these short-term instruments matured.

In spite of the increase in the average term to maturity over the last year, it remains below the pre-crisis level. It should also be emphasised that the total volume of debt issued has increased and that issuance of debt accounts for a larger share of the banks' liabilities. The rising volume of debt instruments to a large extent replaces less stable financing by way of debt to credit institutions so that the liquidity risk profile of the financing has decreased.

The maturity profile for outstanding debt instruments with long maturities (more than 1 year) can give an impression of the challenges facing Danish banks in terms of financing in the next few years. More than half of the long-term financing matures within the next three years, cf. Chart 15. The main reason is that the banks' issuances totalling kr. 191 billion under the individual government guarantee mature by end-2013. Compared with the volume of issuance in previous years, the volume maturing

REDEMPTION PROFILE OF DEBT INSTRUMENTS WITH AN ORIGINAL MATURITY OF MORE THAN 1 YEAR AND PREVIOUS LEVELS — Chart 15



Note: Issuance and redemptions up to and including September 2010.
Source: Danmarks Nationalbank.

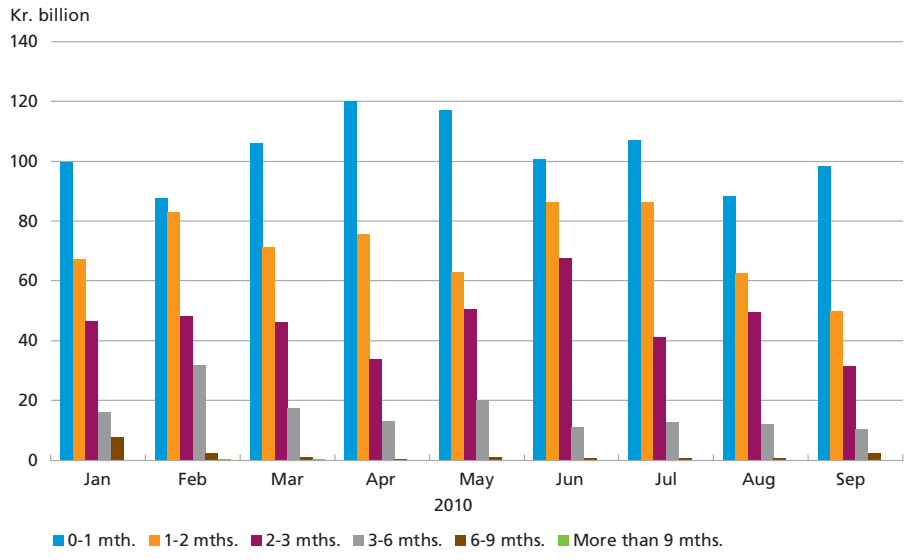
over the next few years is not unusually high. Redemptions peak in 2013, when around kr. 150 billion of the debt currently outstanding will mature, but previously the banks have issued for up to kr. 250 billion in one year.

However, it should be borne in mind that the government-guaranteed issuances have to be replaced by financing without a government guarantee. This could pose a special challenge to the banks that do not normally issue in these markets and to banks with poor or no ratings. It is important for the banks to prepare for this situation well in advance and secure access to new sources of stable financing.

Under the Basel Committee's proposed new liquidity standards, a bank's long-term financing relative to long-term commitments, the Net Stable Funding Ratio, must be at least 1, cf. Box 5. If this requirement is introduced, it is likely to strengthen the incentive for Danish banks to use long-term financing, but in this context long-term financing is defined as issuances with a term to maturity of more than 1 year so it cannot be taken for granted that the average term to maturity will increase compared with today.

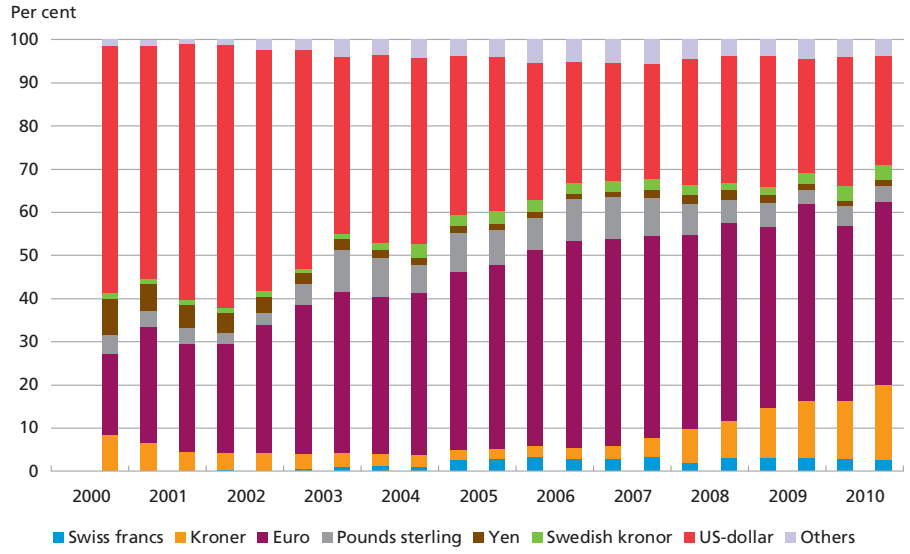
Issuance in the money markets (less than 1 year) primarily takes place among group 1 banks. The share of short-term financing has been decreasing since 2009. The redemption profile is typically highly concentrated on very short-term issuances with maturities of 1-3 months, cf. Chart 16. The Basel Committee's proposal could mean that the banks reduce the share of short-term financing further.

MONTHLY REDEMPTION PROFILES FOR GROUP 1 DEBT INSTRUMENTS WITH AN ORIGINAL MATURITY OF LESS THAN 1 YEAR — Chart 16



Source: Danmarks Nationalbank and Danish Financial Supervisory Authority.

CURRENCY BREAKDOWN OF OUTSTANDING DEBT INSTRUMENTS OF BANKS IN GROUPS 1 AND 2 Chart 17



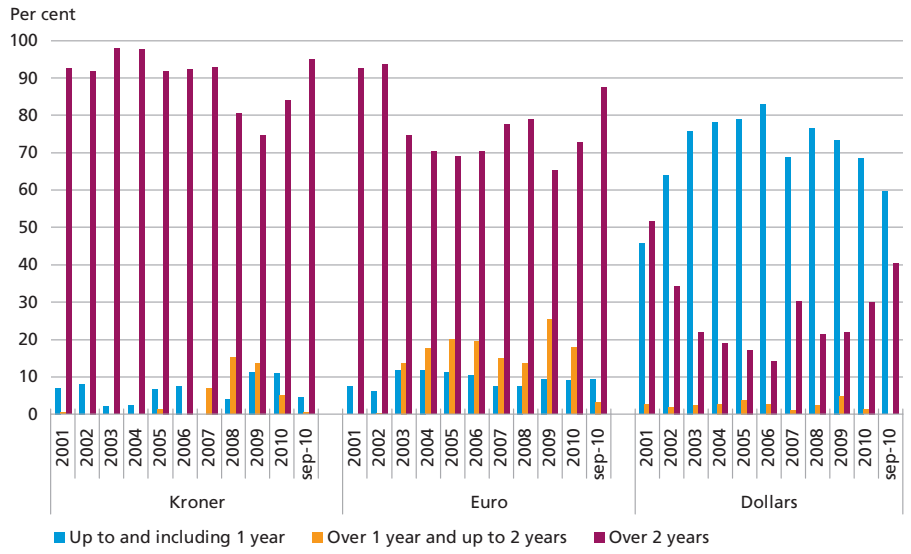
Note: Excluding foreign units. Outstanding volumes in foreign currencies have been converted to Danish kroner on the basis of current exchange rates. Six-month data. The most recent observations are from September 2010.
Source: Danmarks Nationalbank.

A currency breakdown of the debt instruments issued by banks in groups 1 and 2 shows that most of the outstanding debt is in euro and dollars, followed by kroner, cf. Chart 17. The banks in group 3 mainly have debt in kroner. Furthermore, there is a substantial volume of issuances in Swedish kronor, pounds sterling and Swiss francs. The choice of currency can to some extent be driven by a need to support business in the currency in question. Until end-2007, the share of debt instruments issued in dollars was declining, but since then it has been more or less constant. Issuance in euro has been rising. The crisis does not seem to have had any major impact on overall issuance in foreign exchange.

Around one third of the issuances have been swapped into other currencies. In this way, the banks can obtain the desired currency exposure and reduce currency mismatches. Depending on how the currency exposure is managed, this may, however, cause problems if swap markets are disrupted in a stress situation.

Debt issuances in dollars remain dominated by short-term issuances, cf. Chart 18. The share of the outstanding volume of debt instruments that is in dollars has fallen from 80 per cent to 70 per cent. Looking ahead, Danmarks Nationalbank finds it important to reduce dependence on individual markets that may be difficult to access in periods of stress.

BREAKDOWN BY CURRENCY AND (ORIGINAL) MATURITY OF OUTSTANDING DEBT INSTRUMENTS OF BANKS IN GROUPS 1 AND 2 Chart 18



Note: Excluding foreign units. Outstanding volumes in foreign currencies have been converted to Danish kroner on the basis of current exchange rates. Mid-year data.
Source: Danmarks Nationalbank.

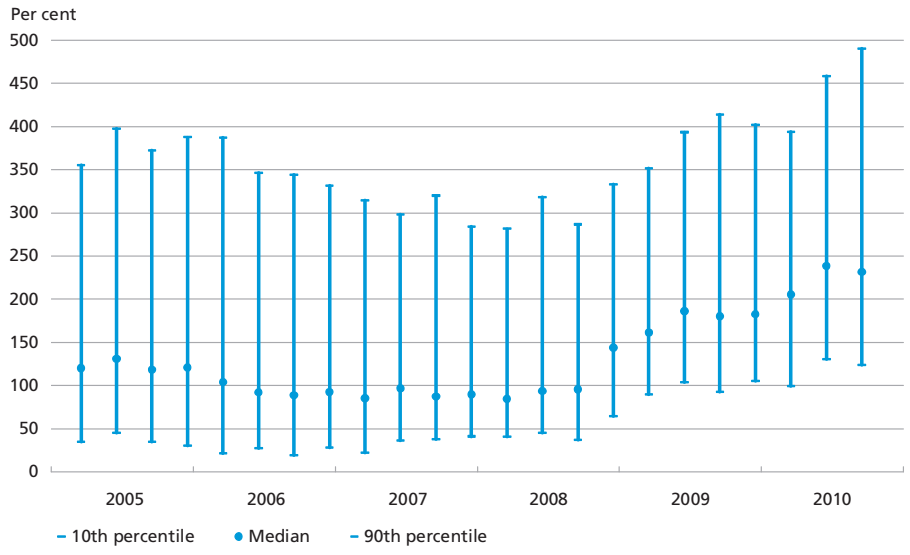
DEVELOPMENT IN EXCESS LIQUIDITY COVER

On the assets side, banks hold portfolios of liquid assets as buffers in case it is necessary to raise liquidity at short notice. This need arises in the event of unforeseen outgoing payments or non-receipt of expected incoming payments. To ensure a minimum level of liquid funds, a bank's portfolio of liquid assets must constitute at least 10 per cent of its total debt and guarantee commitments[1].

Excess liquidity cover relative to the minimum requirement has generally been increasing since March 2008, assessed on the basis of the median bank, cf. Chart 19. This indicates that the liquidity position of the Danish banks has improved. However, there is considerable divergence. In general, group 1 banks have lower excess liquidity cover than the other groups. Large banks often manage their current liquidity positions more tightly, while smaller banks take a more passive approach by holding ample reserves.

[1] Section 152 of the Danish Financial Business Act.

STATUTORY EXCESS LIQUIDITY COVER OF BANKS Chart 19



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, cf. 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 capital base. Quarterly data.
Source: Danish Financial Supervisory Authority.

The Basel Committee's proposal for new liquidity standards includes a minimum requirement for the portfolio of liquid assets that reflects expected net payment flows under a stress scenario laid down by the authorities, referred to as the Liquidity Coverage Ratio, cf. Box 5. This ratio could be seen as an alternative to the current liquidity requirement under section 152 and will lead to tightening of the current liquidity requirement for Danish banks.

STRESS TESTS OF THE BANKS' LIQUIDITY

In 2010, Danmarks Nationalbank and the Danish Financial Supervisory Authority have stepped up their oversight of the liquidity of Danish banks. This means that the banks must submit monthly liquidity forecasts of their section 152 excess liquidity cover for the next 12 months under a baseline scenario and a stress scenario, cf. Box 6. The assumptions in the stress scenario are all based on a fixed outflow of the various sources of financing, both deposits and market-based financing, and are inspired by the stress assumptions outlined in the Basel Committee's proposal for new liquidity standards, cf. Box 5.

STRESS ASSUMPTIONS IN LIQUIDITY MODELS Box 6

Stress assumptions in the LoPi model:

- No debt with a maturity exceeding 1 month is renewed upon expiry.
- The bank cannot issue new bonds.
- The 10 largest time deposits are not renewed upon expiry.
- 100 per cent of short-term debt (<1 month) to credit institutions shall elapse after the first month.
- Deposits excluding the 10 largest time deposits decrease by 1 per cent a month.
- 0.1 per cent of financing guarantees and loss guarantees are activated every month.
- Guarantees increase by 1 per cent per month.
- Lending increases by 1 per cent per month.
- 5 per cent higher drawing every month on credit facilities granted but not exercised.
- Haircut of 10 per cent for equities and 7.5 per cent for bonds.
- Temporary borrowing facilities at Danmarks Nationalbank cannot be included.

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

- All capital-market financing and debt to credit institutions matures contractually and is assumed not to be renewable upon expiry.
- Debt to central banks may be renewed to the extent that this option is available under normal market conditions. Temporary borrowing facilities cannot be included.
- Financing by way of repos or lending of assets defined as liquid under section 152 will still be possible. A similar assumption is made fore reverse repos.
- Stable deposits from retail and corporate customers fall by 6 per cent over the first month and are constant over the remaining months.
- Less stable deposits from retail and corporate customers fall by 12 per cent over the first month and are constant over the remaining months.
- If the bank has a rating, the calculation includes the consequences of downgrading by two notches during the first month to the collateral to be pledged by the bank in connection with derivatives positions concluded.
- Additional collateral requirement corresponding to 10 per cent of collateral currently pledged (net amounts) during the first month. In the subsequent 11 months, the collateral is expected to stabilise at the higher level.
- Drawings on committed credit and liquidity facilities granted but not utilised of 5 per cent for retail customers during the first month, 10 per cent for corporate customers and 100 per cent for credit institutions. Amounts drawn during the first month will not be repaid within the remaining 11 months.
- Possibility of utilising 50 per cent of committed facilities received 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 including euro-denominated mortgage bonds are liquidated with a haircut of 7.5 per cent.
- Other liquid assets included in the definition of liquid assets in section 152 are included with a haircut of 10 per cent.
- Loans to credit institutions mature contractually and are not renewed.
- 0 per cent lending growth to retail and corporate customers, excluding credit institutions.

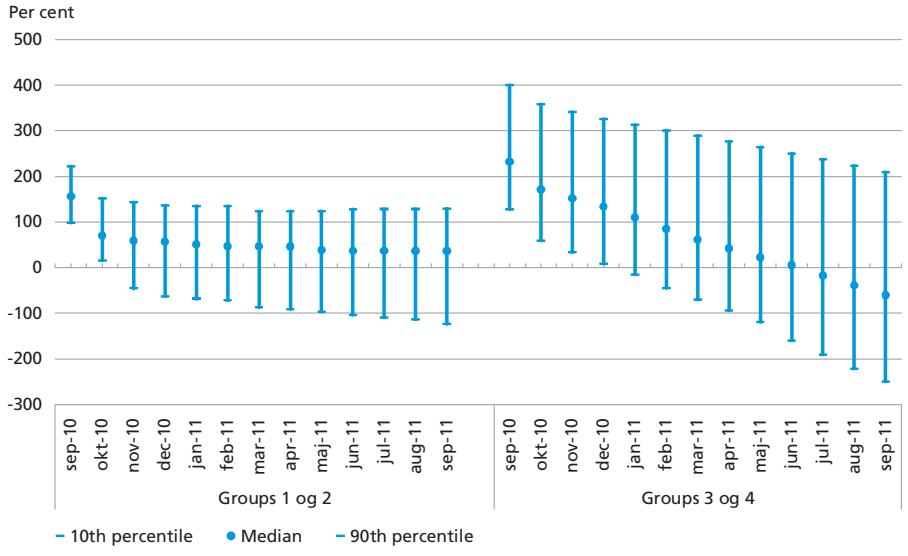
For banks in groups 1 and 2, the forecasts are made using a model set up by the Danish Financial Supervisory Authority and Danmarks Nationalbank, while banks in groups 3 and 4 may opt for a model developed by the Association of Local Banks in Denmark, LoPi, cf. Box 6.

The most recent forecasts are from end-September 2010. These forecasts show that, at the point of departure, the banks in groups 1 and 2 have lower excess liquidity cover than the banks in groups 3 and 4, cf. Chart 20. This is attributable to tighter liquidity management in groups 1 and 2.

Particularly in the first month of the stress scenario, the excess liquidity cover of groups 1 and 2 drops sharply. This reflects the forecast assumptions, with a relatively high stress level in the first month. The LoPi model operates with a more even stress distribution over the forecast period, which is also reflected in the development in excess liquidity cover. The excess liquidity cover of the median bank in groups 1 and 2 does not turn negative, as it does for groups 3 and 4 in month 10 of the stress scenario.

The forecasts show that most of the Danish banks have sufficient liquidity to resist periods of intensive liquidity stress, and data forecasts over the last six months have generally pointed to improvements. However, the forecasts also indicate a wide spread among the banks, both at the point of departure and over the forecast horizon.

DANMARKS NATIONALBANK AND THE DANISH FSA'S STRESS TEST FOR GROUPS 1 AND 2, LoPi'S STRESS TEST FOR GROUP 3 AND 4 — Chart 20



Note: Based on forecasts by 16 banks in groups 1 and 2, 53 in group 3 and 15 in group 4.
Source: Liquidity reporting for September 2010.

The structure of a bank's balance sheet determines how the forecast develops. If a bank is dependent on short-term debt to other credit institutions or short-term debt instruments, it will be severely affected during the first month, as market based financing is assumed to mature contractually. On the other hand, if the bank operates with bond financing with a long term to maturity, it will be able to withstand a longer period of stress. In the model for groups 1 and 2, deposits from retail and corporate customers are assumed to fall by 6-12 per cent over the first month and then stabilise. The model for groups 3 and 4 assumes that deposits will shrink by 1 per cent a month in each of the 12 forecast months, providing for a steadier outflow over the forecast horizon. The forecasts give an indication of the vulnerability of the liquidity positions and are thus indicative of the robustness of the sector. In addition, forecasts for individual banks may identify areas that require special attention over the next 12 months.

Appendix 1

The Appendix provides an overview of developments in a number of macroeconomic variables in the baseline scenario and the three stress scenarios specified in the *Stress Test* chapter.

SPECIFICATION OF SCENARIOS FOR THE DANISH ECONOMY – LATEST FORECAST – TO BE CONTINUED

Table 1

	Base line scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 4
2010					
Real growth, per cent, year-on-year					
GDP	1.6	1.5	1.5	1.5	1.5
Private consumption	2.4	2.2	2.2	2.2	2.2
Public consumption	1.8	1.8	1.8	1.8	1.8
Housing investment	-12.7	-14.0	-14.0	-14.0	-14.0
Business investment	-9.0	-10.2	-10.2	-10.2	-10.2
Public sector investments	16.0	16.0	16.0	16.0	16.0
Inventory investments (contribution to GDP growth)	0.8	0.8	0.8	0.8	0.8
Exports	2.7	2.7	2.7	2.4	2.3
- of which industrial exports	5.0	5.0	5.0	4.5	4.4
Imports	1.9	1.7	1.7	1.5	1.5
Export market growth	6.1	6.1	6.1	5.5	5.5
Nominal growth, per cent, year-on-year					
Private sectors disposable income	6.8	6.7	6.8	6.6	6.7
HICP	2.1	2.1	2.1	2.1	2.1
Hourly wages (industy)	2.6	2.6	2.6	2.6	2.6
House prices	1.5	-0.0	0.2	0.8	0.3
Average level for the year					
Bond yield, per cent p.a.	2.7	2.7	2.9	2.6	2.8
3-month money market interest rate, per cent p.a.	0.6	0.6	0.8	0.6	0.7
Unemployment, thousands	116	117	117	117	117
Total employment, thousands	2,772	2,771	2,771	2,771	2,771
- of which private sector, thousands	1,767	1,766	1,766	1,766	1,766
Labour force, thousands	2,888	2,888	2,888	2,888	2,888
Unemployment rate, per cent	4.0	4.1	4.1	4.1	4.1
Net borrowing/net lending, private sector, kr. billion	165	168	169	167	168
Government budget balance, kr. billion	-84	-85	-86	-85	-86
B.o.p. current account, kr. billion	81	83	83	81	81
Crude oil price, dollar/barrel	78	78	78	78	78

SPECIFICATION OF SCENARIOS FOR THE DANISH ECONOMY – LATEST FORECAST –CONTINUED

Tabel 1

	Base line scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 4
2011					
Real growth, per cent, year-on-year					
GDP	1.7	0.0	-0.3	-1.2	-1.6
Private consumption	2.3	-0.5	-0.0	-1.0	-1.1
Public consumption	1.0	1.0	1.0	1.0	1.0
Housing investment	2.0	-12.7	-20.7	-13.2	-20.7
Business investment	5.5	-4.9	-7.4	-6.9	-9.5
Public sector investments	-13.3	-13.3	-13.3	-13.3	-13.3
Inventory investments (contribution to GDP growth)	0.5	0.5	0.5	0.5	0.5
Exports	2.4	2.4	2.1	-1.7	-1.8
- of which industrial exports	3.2	3.3	2.9	-2.4	-2.3
Imports	3.9	0.8	0.3	-2.0	-2.6
Export market growth	4.3	4.3	3.0	-3.6	-4.2
Nominal growth, per cent, year-on-year					
Private sectors disposable income	3.8	2.7	3.6	1.2	2.2
HICP	1.7	1.8	1.8	1.7	1.7
Hourly wages (industy)	2.6	2.5	2.5	2.4	2.3
House prices	1.5	-13.7	-14.6	-6.1	-14.3
Average level for the year					
Bond yield, per cent p.a.	2.9	2.9	5.4	2.2	5.1
3-month money market interest rate, per cent p.a.	0.7	0.7	2.2	0.6	2.0
Unemployment, thousands	120	140	143	158	162
Total employment, thousands	2,768	2,748	2,745	2,730	2,726
- of which private sector, thousands	1,764	1,746	1,741	1,727	1,723
Labour force, thousands	2,888	2,888	2,888	2,888	2,888
Unemployment rate, per cent	4.2	4.8	5.0	5.5	5.6
Net borrowing/net lending, private sector, kr. billion	153	197	215	186	210
Government budget balance, kr. billion	-83	-100	-118	-105	-126
B.o.p. current account, kr. billion	69	96	97	80	84
Crude oil price, dollar/barrel	81	81	81	81	81

SPECIFICATION OF SCENARIOS FOR THE DANISH ECONOMY – LATEST FORECAST –CONTINUED

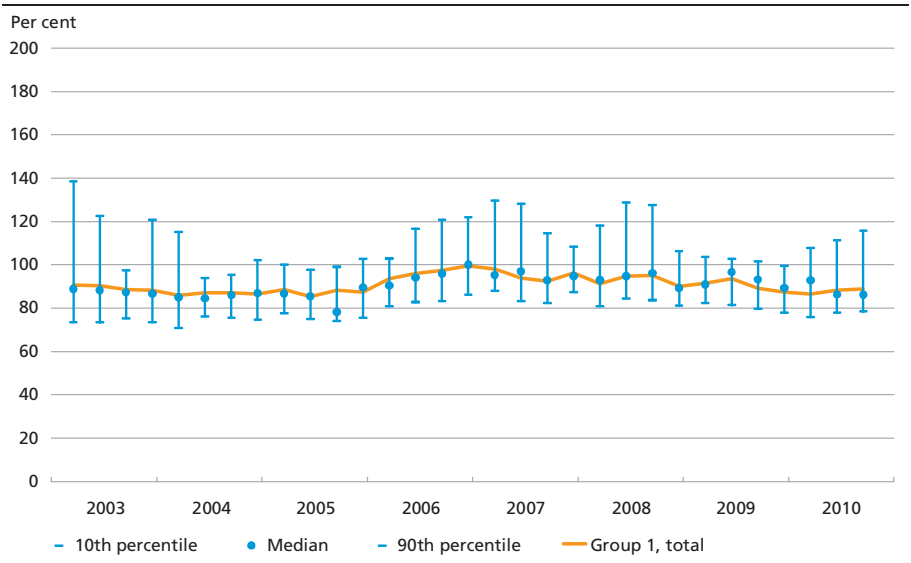
Tabel 1

	Base line scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 4
2012					
Real growth, per cent, year-on-year					
GDP	2.0	0.8	-0.3	-1.3	-2.4
Private consumption	3.3	0.8	0.7	-1.2	-1.9
Public consumption	0.8	0.8	0.8	0.8	0.8
Housing investment	4.0	-1.5	-23.1	-4.7	-27.4
Business investment	4.8	1.5	-5.1	-4.2	-12.2
Public sector investments	-5.1	-5.1	-5.1	-5.1	-5.1
Inventory investments (contribution to GDP growth)	0.1	0.1	0.1	0.1	0.1
Exports	2.5	2.6	1.9	-1.6	-1.2
- of which industrial exports	3.9	4.2	3.9	0.2	1.4
Imports	3.9	2.4	1.0	-1.5	-2.7
Export market growth	5.6	5.6	3.5	-0.4	-0.4
Nominal growth, per cent, year-on-year					
Private sectors disposable income	2.2	1.9	1.6	-0.3	0.1
HICP	1.6	1.5	1.5	1.4	1.3
Hourly wages (industy)	3.0	2.3	2.1	1.5	1.2
House prices	2.0	-8.5	-11.1	-6.9	-14.6
Average level for the year					
Bond yield, per cent p.a.	3.4	3.4	6.5	2.2	6.1
3-month money market interest rate, per cent p.a.	0.9	0.9	2.7	0.6	2.4
Unemployment, thousands	111	155	176	219	239
Total employment, thousands	2,779	2,735	2,714	2,671	2,651
- of which private sector, thousands	1,775	1,732	1,710	1,667	1,647
Labour force, thousands	2,890	2,890	2,890	2,890	2,890
Unemployment rate, per cent	3.8	5.3	6.1	7.6	8.3
Net borrowing/net lending, private sector, kr. billion	119	198	238	192	255
Government budget balance, kr. billion	-59	-94	-130	-114	-159
B.o.p. current account, kr. billion	60	103	108	78	96
Crude oil price, dollar/barrel	85	85	85	85	85

Appendix 2

Chart 1, 2 og 3 shows the lending ratio of Group 1, 2 and 3 banks.

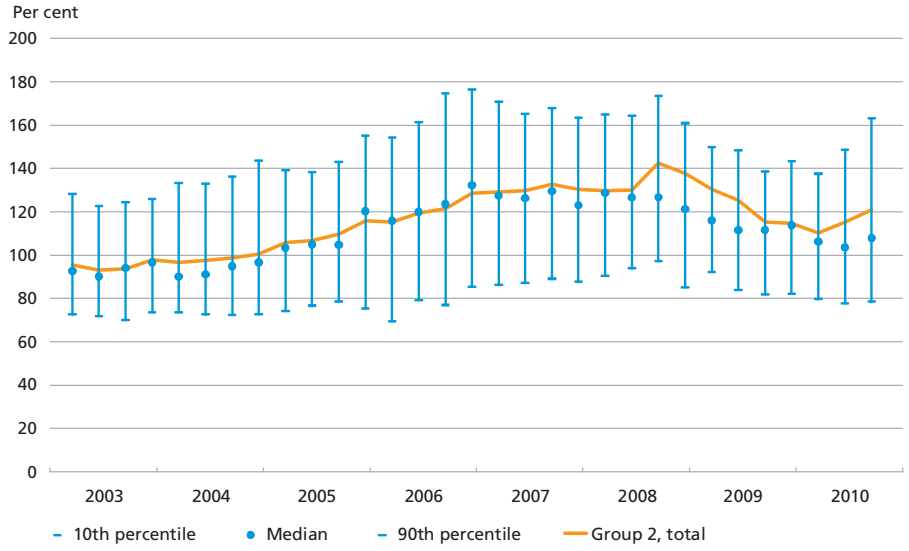
LENDING RATIOS OF GROUP 1 BANKS, EXCLUDING REPO TRANSACTIONS Chart 1



Note: Comprises banks in group 1 at the beginning of 2010, excluding FIH Erhvervsbank because of this bank's special business model. 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 loan volumes in group 1. Quarterly data.

Source: Danmarks Nationalbank.

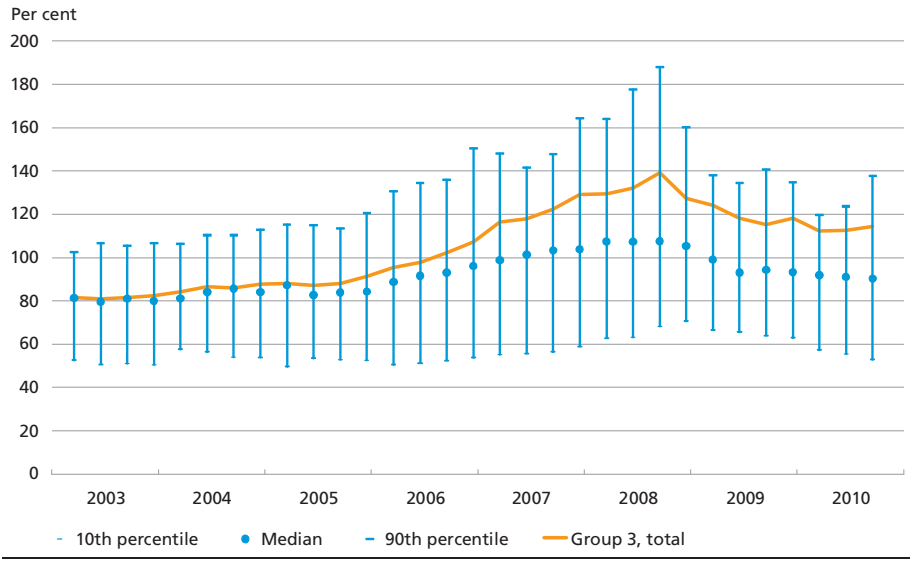
LENDING RATIOS OF GROUP 2 BANKS, EXCLUDING REPO TRANSACTIONS Chart 2



Note: Comprises banks 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 loan volumes in group 2. Quarterly data.

Source: Danmarks Nationalbank, Financial Stability Company.

LENDING RATIOS OF GROUP 3 BANKS, EXCLUDING REPO TRANSACTIONS Chart 3



Note: Comprises banks 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 loan volumes in group 3. Quarterly data.

Source: Danmarks Nationalbank, Financial Stability Company.