Danmarks Nationalbank

Financial stability

2010

DANMARKS NATIONAL BANK 2010

FINANCIAL STABILITY 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

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Foreword

Under the 1936 Danmarks Nationalbank Act, Danmarks Nationalbank must maintain a safe and secure currency system and facilitate and regulate the traffic in money and the extension of credit. One of Danmarks Nationalbank's main objectives is thus to contribute to the stability of the financial system. This is done by monitoring financial stability, overseeing payment systems, compiling financial statistics and managing the central government's debt.

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 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.

Introduction and Summary

The banking institutions' earnings in 2009 were affected by the Danish and international economic slowdown, and write-downs on loans were generally substantial. The banking institutions improved their capital bases during the year, which can be primarily attributed to injections of hybrid core capital from the Danish government to several institutions.

The banking institutions' write-downs in 2010 are expected to be slightly lower than in 2009, but will remain relatively high.

Analyses show that the overall household sector is basically robust. However, some households are exposed to interest-rate increases as a consequence of the widespread use of adjustable-rate loans. Moreover, rising interest rates will entail a risk of falling housing prices, which will exacerbate the banking institutions' and mortgage-credit institutes' losses.

According to Danmarks Nationalbank's stress test, the major Danish banking institutions generally have sufficient capital buffers to weather the expected economic development until 2012. A few institutions, however, may find it difficult to meet the statutory solvency requirement. Sensitivity calculations show that the problems may spread in the event of a marked increase, corresponding to those seen in the early 1990s, in losses on the sectors agriculture, building and construction and property administration. These sectors are particularly exposed. In the stress test the banking institutions are exposed to negative shocks to the economy in three scenarios. These scenarios are seen as low probability events. The stress test shows that in the most severe scenarios write-downs are so large that many institutions will need to strengthen their capital bases towards the end of the period.

Liquidity has improved over the past year for the banking institutions overall, although there is pronounced dispersion between the institutions. The institutions need to be prepared for the expiry of the general government guarantee on 30 September 2010. This includes exploiting the opportunity of buying individual government guarantees if required.

A few institutions' difficulties in meeting the statutory solvency requirement increase the risk of concerns about the situation of other institutions, which may in turn impede the access to liquidity. It is thus important for the institutions to have sufficient buffers against periods of constraints on new liquidity.

At present Danmarks Nationalbank does not find it necessary to propose new initiatives.

Earnings and capital adequacy in the financial sector

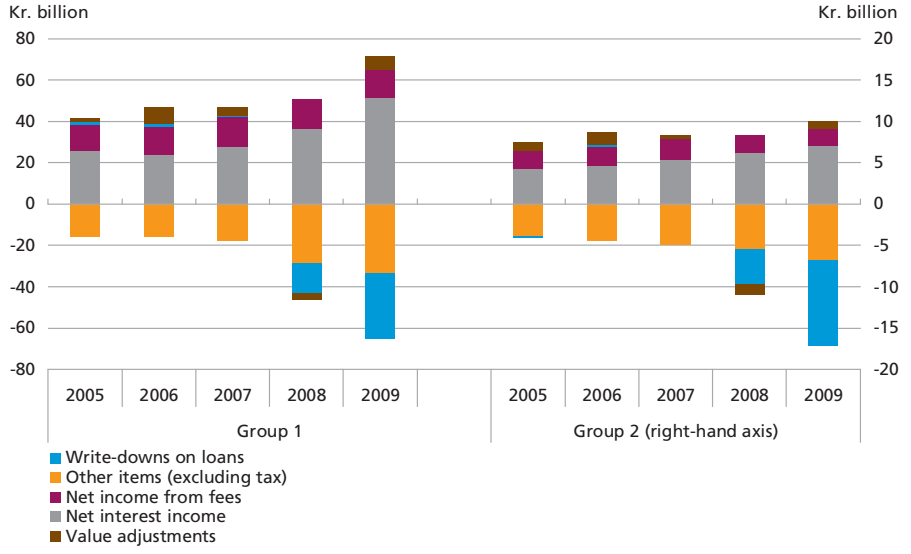
The large banking institutions, group 1, achieved a total profit before tax of kr. 6.2 billion in 2009, compared to kr. 4.5 billion in 2008. The medium-sized banking institutions, group 2, recorded a total loss before tax of kr. 7.1 billion in 2009, against a loss of kr. 2.7 billion in 2008.

Net interest income rose considerably in 2009, and the institutions posted large, positive value adjustments, especially in the 1st half of 2009. The slowdown in the Danish economy and falling property prices entailed large write-downs in 2009, cf. Chart A.

Total lending by banking institutions in group 1 declined by 11 per cent. Group 2 saw a decrease in lending by 5 per cent.

The banking institutions in groups 1 and 2 improved their capital bases during 2009. Two institutions in group 1 and five in group 2 received hybrid core capital totalling kr. 31 billion from the Danish government. In addition, two institutions in group 1 and one in group 2 issued new shares totalling kr. 2.7 billion in the market, while one institution in group 1 and two in group 2 have received fresh share capital from their parent companies.

EARNINGS BROKEN DOWN BY KEY ITEMS — Chart A



Note: Net interest income is interest income less interest expense. Net income from fees comprises income from shares, etc. and fee and commission income less fee and commission expense. Other items (excluding tax) comprise other operating income, staff costs and administrative expenses, amortisation, depreciation and impairment of intangible and tangible assets, other operating expenses and income from investments in associates and group undertakings.

Source: The Danish Financial Supervisory Authority.

The mortgage-credit institutes delivered a total profit before tax (excluding profit from equity investments) of kr. 10 billion in 2009. For the mortgage-credit institutes, write-downs on loans rose overall from kr. 1.3 billion in 2008 to kr. 4.6 billion in 2009. Total lending by mortgage-credit institutes increased by 7 per cent.

The corporate sector and the households

Danmarks Nationalbank's failure-rate model shows slightly lower failure rates for companies in 2010 than in 2009. Consequently, the banking institutions are expected to post slightly lower write-downs in 2010 than in 2009. In a longer perspective, the number of compulsory liquidations remains substantial. The need for write-downs among the banking institutions is thus expected to remain considerable.

The agricultural sector has been in dire financial straits in recent years. In 2010 the terms of trade of the sector are expected to improve somewhat, but the number of enforced sales is expected to rise further in 2010.

Household wealth has diminished over the past two years, but remains high in a longer perspective. The households' growing use of adjustable-rate loans has increased their interest-rate exposure in recent years. Overall, the households remain robust.

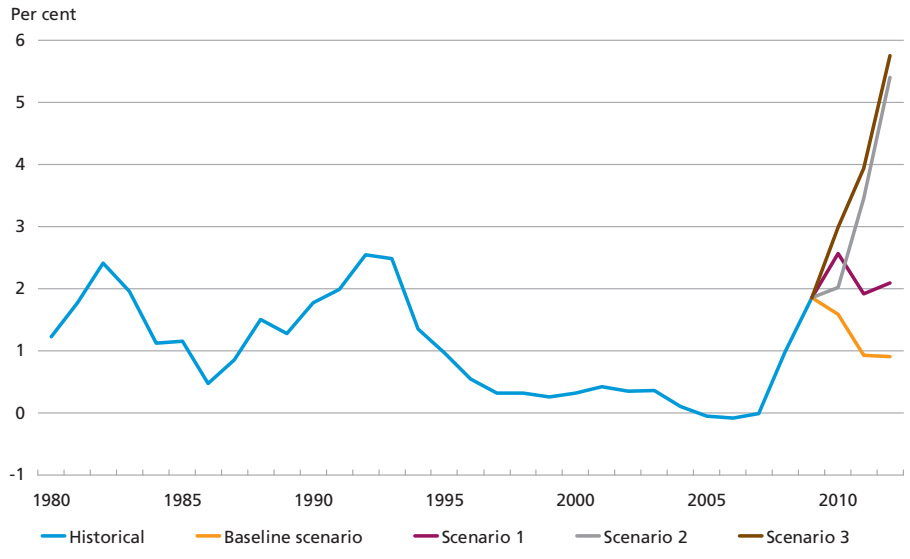
Stress test

Danmarks Nationalbank's stress test provides the basis for a general assessment of the resilience of the financial sector. The development in the financial sector is modelled in four scenarios – a baseline scenario and three stress scenarios. The stress scenarios are seen as low probability events and are used to illustrate the resilience of the banking institutions. In the baseline scenario write-downs are expected to decrease to 1.6 per cent in 2010, cf. Chart B.

In the baseline scenario and scenario 1, some institutions are expected to encounter problems meeting the statutory solvency requirement in 2011 and 2012, but most institutions are deemed to be able to get through the period. In scenarios 2 and 3, several institutions will be struggling to meet the statutory requirements by the end of 2011, while the capital adequacy of most of the institutions will fall below the statutory requirement in 2012.

A separate sensitivity analysis of the sectors agriculture, property administration and building and construction shows that if write-down ratios over three years reach a level corresponding to the levels in the early 1990s, a considerable number of banking institutions will find it difficult to meet the statutory solvency requirements.

AGGREGATED WRITE-DOWN RATIOS Chart B



Note: Weighted average. The historical series is based on groups 1-3 of the Danish Financial Supervisory Authority, while the observation for 2009 and the estimated write-downs in 2010-12 apply to the institutions in the stress test.
Source: Baldvinsson et al. (2005), Dansk Bankvæsen (The Danish Banking System), 5th edition, Forlaget Thomson, the Danish Financial Supervisory Authority and own calculations.

The stress test does not prompt Danmarks Nationalbank to suggest new initiatives at present.

Liquidity

In the light of the experiences during the financial crisis Danmarks Nationalbank and the Danish Financial Supervisory Authority have joined forces to intensify liquidity monitoring of Danish banking institutions. The monitoring provides an overview of liquidity up to 30 September when the general government guarantee expires.

The deposit deficit of the banking institutions has decreased since 2008, which has reduced the institutions' need for market-based financing and their exposure to related liquidity risks. Concurrently, the maturity of market-based financing has increased.

The banking institutions can abate liquidity risk by accumulating portfolios of liquid assets, and the excess liquidity cover was expanded overall in 2009.

Some banking institutions – particularly in group 3 – have been supported by Danmarks Nationalbank's temporary liquidity-supporting measures. Parts of these measures were scheduled to expire on 30 September 2010, but have been extended until 26 February 2011.

Overall, the Danish banking institutions have improved their liquidity over the past year. It is paramount that the institutions continue to focus

on their liquidity needs, applying financing strategies conducive to the necessary security.

Danmarks Nationalbank's oversight of the financial infrastructure in Denmark

The Danish payment and settlement systems have been more or less unaffected by the financial crisis. The most serious problems for the Danish payment and settlement systems in 2009 were related to system breakdowns at their joint provider of IT operational services. The companies behind the Danish payment and settlement infrastructure and key participants have all outsourced their IT operations to the same service provider, which could entail concentration risk. Danmarks Nationalbank will be investigating this risk.

Earnings and Capital Adequacy in the Financial Sector

The Danish and international economic recession affected the banking institutions' earnings in 2009. Overall, the group 1 institutions recorded a modest improvement in their return on equity, but the level remains low compared with the level in the years preceding the crisis. Group 2 saw an overall reduction in the return on equity, to almost -35 per cent. In this group there was considerable dispersion between the various institutions, primarily reflecting large differences in write-downs on loans.

In general, the write-downs on loans were high, and many banking institutions had to post extraordinarily large write-downs on property financing. In group 1, quarterly write-downs showed a slight downward trend during 2009, but this was not the case for group 2.

The banking institutions improved their capital bases during the year, which can be attributed to injections of hybrid core capital from the Danish government to several institutions under the Credit Package. Consequently, the banking institutions are in a better position to meet future losses than they were at end-2008.

As regards the mortgage-credit institutes, arrears ratios increased for both households and the corporate sector. Write-downs also increased, but remained low.

The life insurance companies in the financial groups achieved substantially higher returns on investments than in 2008 and have again begun to build up reserves from a low level.

BANKING INSTITUTIONS

Earnings still affected by the crisis

The financial crisis badly affected the earnings of the banking institutions in the 4th quarter of 2008. The weak economy, particularly in the 1st half of the year, impacted on the 2009 profits, but nevertheless several institutions recorded modest improvements on 2008.

The large banking institutions, group 1, achieved an overall profit before tax of kr. 6.2 billion in 2009, compared to kr. 4.5 billion in 2008. The medium-sized banking institutions, group 2, recorded a total loss before tax of kr. 7.1 billion in 2009, against a loss of kr. 2.7 billion in 2008.

BANKING INSTITUTIONS IN GROUPS 1 AND 2 Box 1

The analyses in this section are based on the banking institutions included in the Danish Financial Supervisory Authority's groups 1 and 2 as at 31 December 2009. Group 1 comprises institutions with working capital of at least kr. 50 billion, while group 2 comprises institutions with working capital of at least kr. 10 billion. Unlike in the Danish Financial Supervisory Authority's groups, these analyses exclude FIH Kapital Bank, which is a fully-owned subsidiary of FIH Erhvervsbank, and Sammenslutningen Danske Andelskasser, which is an umbrella organisation for 20 cooperative banks. Banking institutions acquired by the Financial Stability Company have not been included in the analyses either.[1]

Group 1	**Group 2**
Danske Bank	Alm. Brand Bank
FIH Erhvervsbank	Amagerbanken
Jyske Bank	Arbejdernes Landsbank
Nordea Bank Danmark	Forstædernes Bank
Nykredit Bank[2]	Ringkjøbing Landbobank
Sydbank	Spar Nord Bank
	Sparbank
	Sparekassen Sjælland[3]
	Vestjysk Bank

Lending by groups 1 and 2 was approximately 85 and 10 per cent, respectively, of total lending by Danish banking institutions as at 31 December 2009.

To ensure the best possible grouping consistency over time, figures for previous years have been based on data for the banking institutions included in the respective groups as at 31 December 2009. For institutions formed by the merger of two or more legal entities, figures for the institution in the years before the merger have been stated as the sum of the figures for each of the merged entities.

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 – through subsidiaries or through branches – does not affect the analyses.

Group 2 includes Alm. Brand Bank and Forstædernes Bank, both of which posted financial results for 2009 that were substantially poorer than those of the other institutions. Consequently, the average for group 2 cannot be seen as an expression of the general level within the group, as the dispersion is considerable. These two institutions received capital injections from their respective parent companies, Alm. Brand and Nykredit Realkredit, in 2009.

[1] 1 Banking institutions in groups 1 and 2 are members of the Danish Contingency Association and liable for part of the losses incurred by the winding-up company. Some of the write-downs pertaining to institutions under the winding-up company are included as write-downs under groups 1 and 2.

[2] 2 In Financial stability 2009, 1st half, Nykredit Bank was included in group 2. Its working capital now exceeds kr. 50 billion and consequently it has been included in group 1.

[3] 3 The working capital of Sparekassen Sjælland now exceeds kr. 10 billion and consequently it has been moved from group 3 to group 2.

RETURN ON EQUITY BEFORE TAX Chart 1

Source: Danish Financial Supervisory Authority.

There are major differences between the institutions, not least in group 2. Box 1 lists the institutions included in groups 1 and 2, respectively.

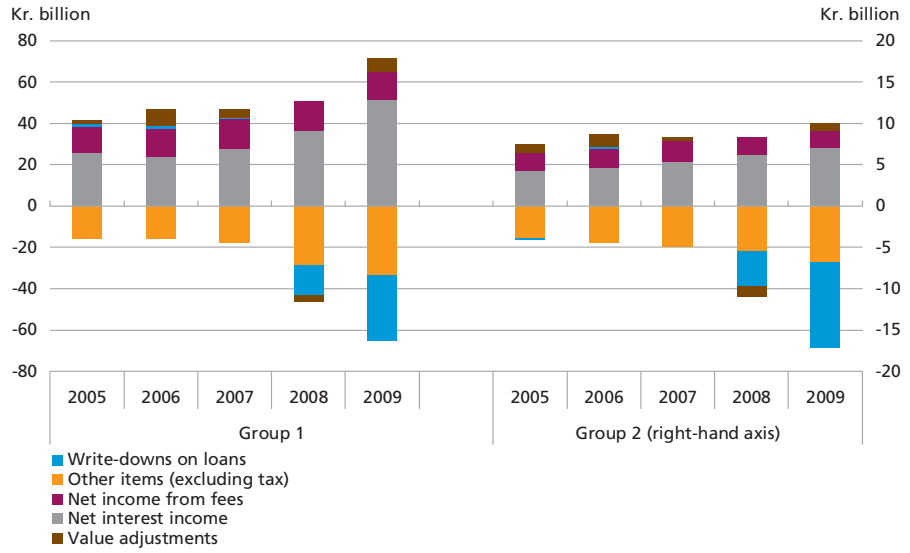
Return on equity, ROE, before tax for groups 1 and 2 is shown in Chart 1. In group 1, earnings improved in 2009 and the weighted average ROE before tax rose from 2.7 per cent in 2008 to 3.7 per cent in 2009. The level was much higher in the years preceding the financial crisis. Group 2, on the other hand, performed considerably worse in 2009 than in 2008. The weighted average ROE before tax fell from -13.4 per cent in 2008 to -36.1 per cent in 2009.

There is considerable dispersion within group 2. ROE before tax for the individual institutions in this group varies from -198.2 per cent to 15.9 per cent.

Net interest income rose substantially in 2009, cf. Chart 2, reflecting an increase in the banking institutions' interest margins, cf. Danmarks Nationalbank's interest-rate statistics. At the same time, the general government guarantee under the Bank Rescue Package helped to reduce the institutions' costs for short-term financing.[1] The low level of interest rates reduced the opportunity to reduce deposit rates as central-bank interest rates fell.

[1] Guarantee commission related to the Bank Rescue Package are included as *Other operating costs* in the income statement. Consequently, this commission is not included in the statement of the banking institutions' net interest income.

EARNINGS BROKEN DOWN BY KEY ITEMS Chart 2



Note: Net interest income is interest income less interest expense. Net income from fees comprises income from shares, etc. and fee and commission income less fee and commission expense. Other items (excluding tax) comprise other operating income, staff costs and administrative expenses, amortisation, depreciation and impairment of intangible and tangible assets, other operating expenses and income from investments in associates and group undertakings.

Source: The Danish Financial Supervisory Authority.

The banking institutions posted large positive value adjustments, particularly in the 1st half of 2009. This is partly attributable to stabilisation of the financial markets following the strong turmoil in the autumn of 2008, partly to extensive customer activity on the banks' trading floors.

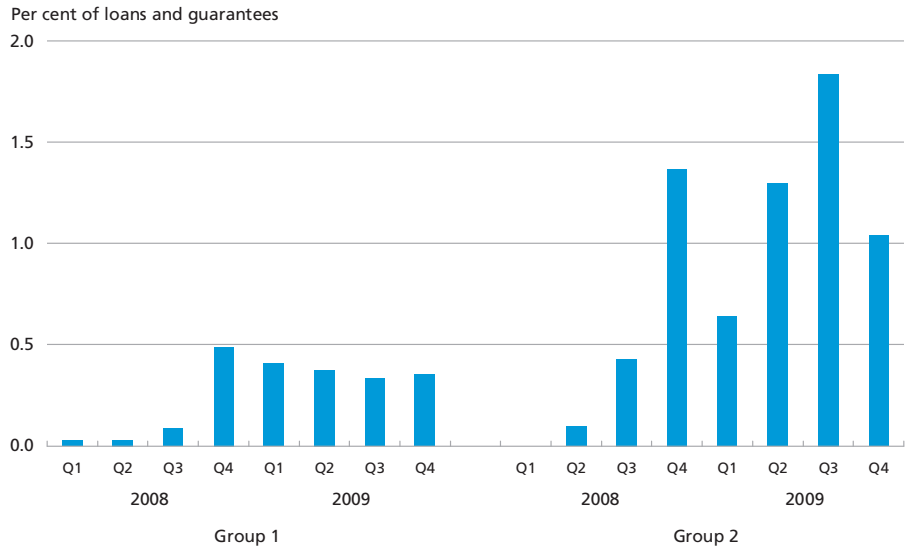
Large write-downs on loans

The downturn in the Danish economy and falling property prices led to very large write-downs in 2009. In group 1, write-downs during the year totalled kr. 31.9 billion, corresponding to a weighted average write-down ratio of 1.5 per cent. The corresponding figures for group 2 were kr. 10.3 billion and 4.8 per cent. For groups 1 and 2 overall, the weighted average write-down ratio for the year was 1.9 per cent.

Write-downs related mainly to corporate customers. Several banking institutions in group 2 posted extraordinarily large write-downs on property financing exposures. A few also recorded heavy write-downs on mortgage deeds.

In group 1, write-downs decreased slightly over the first nine months of 2009, cf. Chart 3. The write-down ratio for the 4th quarter was in line with that of the 3rd quarter and remained high compared with previous years. No falling trend was registered for group 2.

QUARTERLY WRITE-DOWNS IN PER CENT OF LOANS AND GUARANTEES Chart 3



Note: Write-down ratio for the period (not annualised).
Source: Danish Financial Supervisory Authority.

Of the total group 1 write-downs during the year, kr. 3.3 billion is attributable to the recourse guarantee under the Bank Rescue Package. For group 2, the corresponding amount is kr. 0.6 billion.[1]

The increased need for write-downs since mid-2008 has only to a limited extent materialised as actual losses. Under the current accounting rules, banking institutions must write down the value of a loan when there is objective evidence of impairment. Consequently, the write-downs are normally recognised before the actual losses are observed.

A decline in lending by banking institutions

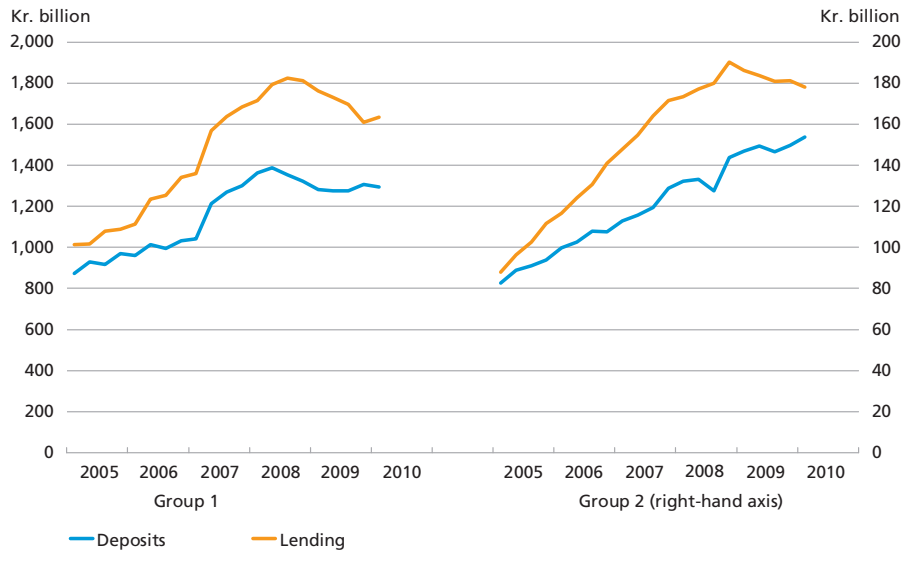
Total lending by banking institutions in group 1 fell by 11 per cent, from kr. 1,813 billion at end-2008 to kr. 1,610 billion at end-2009, cf. Chart 4. In group 2, lending fell by 5 per cent, from kr. 190 billion at end-2008 to kr. 181 billion at end-2009, but remained unchanged from the 3rd to the 4th quarter of 2009.

The decline in group 1 reflects a fall in lending to the corporate sector of 11 per cent and to insurance and pension companies of 51 per cent.[2] Lending to households increased by 3 per cent. The decline in lending to

[1] Under the Bank Rescue Package, the banking institutions in the Danish Contingency Association provide annual guarantee commission totalling kr. 7.5 billion to the Financial Stability Company. The Association is liable for losses in the winding-up company of up to kr. 10 billion. If the losses exceed the sum of the kr. 10 billion and the guarantee commission, the Danish Contingency Association is liable for a further kr. 10 billion.

[2] The fall in lending to insurance and pension companies should be viewed in the light of a fall in the banking institutions' repo lending.

DEVELOPMENTS IN DEPOSITS AND LENDING, QUARTERS — Chart 4



Note: Lending calculated before write-downs.
Source: Danmarks Nationalbank, statistics on the MFI sector.

the corporate sector was to some extent attributable to substitution from bank loans to mortgage credit.

Total deposits remained more stable. In group 1 they fell marginally by 1 per cent, from kr. 1,322 billion at end-2008 to kr. 1,306 billion at end-2009. In group 2 they rose by 4 per cent, from kr. 144 billion at end-2008 to kr. 150 billion at end-2009.

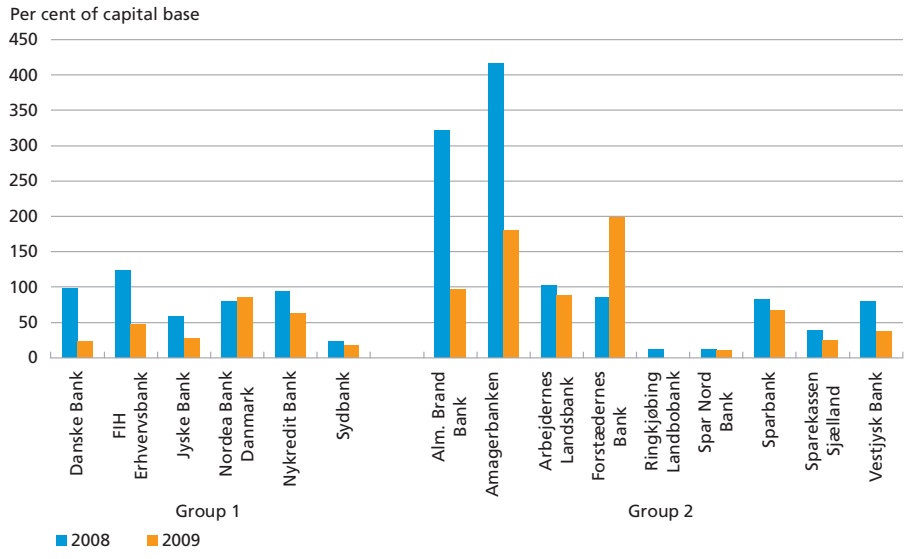
Several banking institutions have recorded considerable write-downs on large single exposures. During 2009, all institutions except for two improved their "sum of large exposures as a percentage of capital base" ratio, cf. Chart 5. In their financial statements, several institutions state that they have focused on reducing large exposures. The improvement of the ratio is also attributable to a general improvement in the institutions' capital base. The size of an institution's capital base determines whether an exposure is deemed to be large.[1]

A strengthened capital base

The banking institutions in groups 1 and 2 strengthened their capital bases during 2009, partly due to capital injections by the government under the Credit Package. Thus, two institutions in group 1 and five in group 2 received hybrid core capital totalling kr. 31 billion from the Danish govern-

[1] An exposure is deemed to be large if it exceeds 10 per cent of the capital base. Under Danish law a large exposure may not exceed 25 per cent of the capital base, and the sum of large exposures may not exceed 800 per cent of the capital base.

SUM OF LARGE EXPOSURES AS A PERCENTAGE OF CAPITAL BASE Chart 5



Source: Danish Financial Supervisory Authority.

ment. In addition, two institutions in group 1 and one institution in group 2 issued new shares via the market for a total of kr. 2.7 billion, while one institution in group 1 and two in group 2 received new share capital from their parent companies. An overview of capital injections into group 1 and 2 institutions can be found on p. 23 in Danmarks Nationalbank, Stress Tests, 2nd Half 2009.

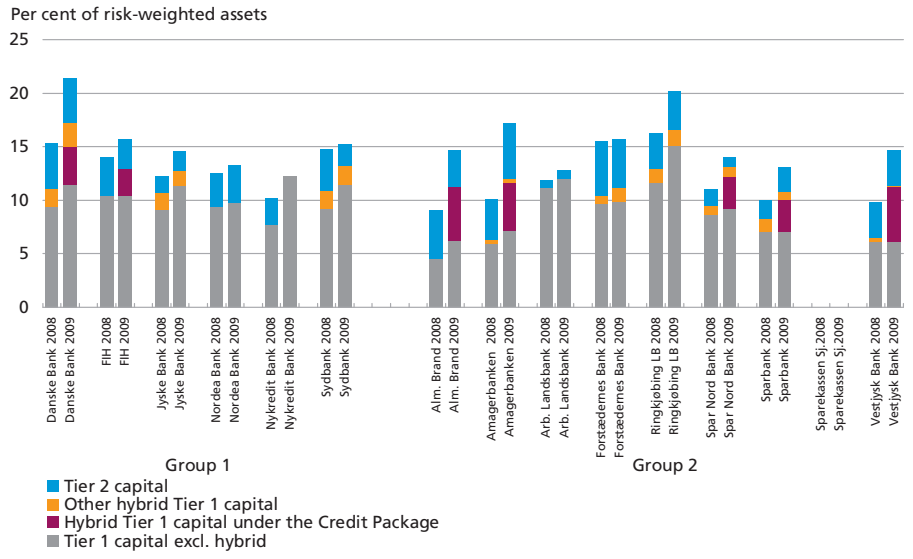
Combined with the fall in risk-weighted assets, the injection of fresh capital has improved the banking institutions' Tier 1 and solvency ratios. Risk-weighted assets fell by an average (weighted) of 10 per cent in 2009, reflecting the reduction in loans and guarantees.

The composition of the capital bases of the individual banking institutions in 2008 and 2009 is shown in Chart 6.

In connection with the publication of their financial statements for 2009, the Danish banking institutions and mortgage-credit institutes had to publish their individual capital needs for the first time. This figure indicates the institution's own assessment of the capital base required to cover the risks associated with its activities. The individual capital need may, however, not be lower than the minimum requirement of 8 per cent of the risk-weighted assets or any higher solvency requirement as determined by the Danish Financial Supervisory Authority.[1] The individual capital needs can be difficult to compare and should be viewed in relation

[1] In January 2010, the Danish Financial Supervisory Authority issued guidelines on adequate capital bases and capital needs for banking institutions.

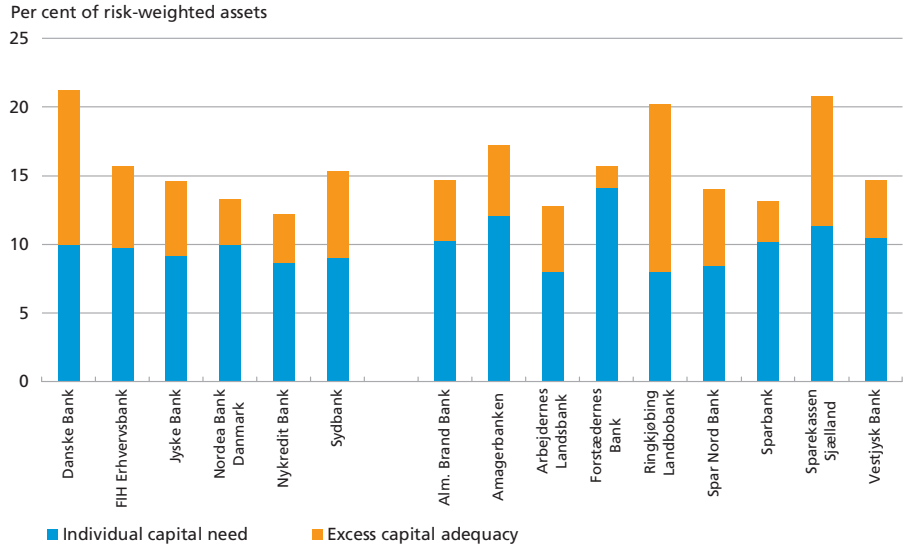
COMPOSITION OF CAPITAL BASE — Chart 6



Source: Danish Financial Supervisory Authority.

to the overall risk profiles and strategies of the individual institutions. However, the capital need provides important market information about the institution in question.

SOLVENCY RATIOS AND INDIVIDUAL CAPITAL NEEDS — Chart 7



Note: Institutions applying the Internal Ratings-Based approach to calculation of credit risk are subject to a transitional arrangement and must have a capital base that constitutes at least 80 per cent of the solvency requirement under the previous rules (Basel I). The requirements under the transitional scheme are lower than the institutions' individual capital needs and are therefore not illustrated.

Source: Danish Financial Supervisory Authority.

Chart 7 shows the excess capital adequacy of the individual banking institutions relative to their individual capital needs. Forstædernes Bank stands out in that it has the highest capital need and the lowest excess capital adequacy. The relatively low excess capital adequacy should be viewed in the context of the acquisition of the bank by Nykredit Realkredit in 2008 and its merger with Nykredit Bank in April 2010. Subsidiaries of other financial enterprises may have relatively modest excess capital adequacy as capital can be provided by the parent company.

Nordic banking groups

Danske Bank and Nordea Bank Danmark are part of large banking groups with activities in most of the Nordic region, the Baltics and a few other countries. Danske Bank and Nordea are the largest banking groups in the Nordic region in terms of total assets, cf. Table 1.

Write-downs in the six largest groups increased substantially relative to 2008, in terms of both annual and accumulated write-downs, cf. Chart 8.

The wide spread in the level of write-downs among the Nordic groups is to some extent attributable to differences in the geographical distribution of their credit exposures, cf. Chart 9. Danske Bank posted considerable write-downs in Ireland and the Baltics, which have been more severely affected by the economic downturn than the Scandinavian countries. Likewise, SEB and Swedbank recorded large write-downs in the Baltics and several Eastern European countries. The write-downs of Handelsbanken, which is primarily exposed in Scandinavia and the UK, remained very low compared with those of the other Nordic groups.

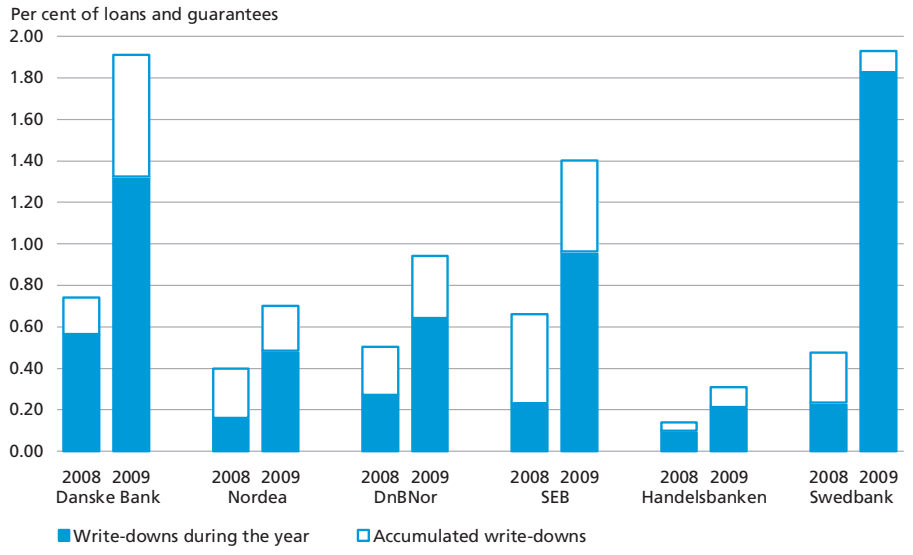
TOTAL ASSETS AND RETURN ON EQUITY FOR NORDIC BANKING GROUPS Table 1

	Total assets, kr. billion	Return on equity before tax, per cent	
	31 Dec. 2009	2008	2009
Danske Bank	3,098	2.2	4.8
Nordea	3,777	19.4	15.3
DnB Nor	1,631	15.5	12.1
SEB	1,668	15.5	3.7
Handelsbanken	1,534	20.5	17.4
Swedbank	1,297	17.9	-10.7

Note: Return on equity before tax is calculated as the operating profit relative to the average equity. Not adjusted for differences in the groups' accounting policies. Total assets in foreign currency have been translated at the exchange rate on 31 December 2009.

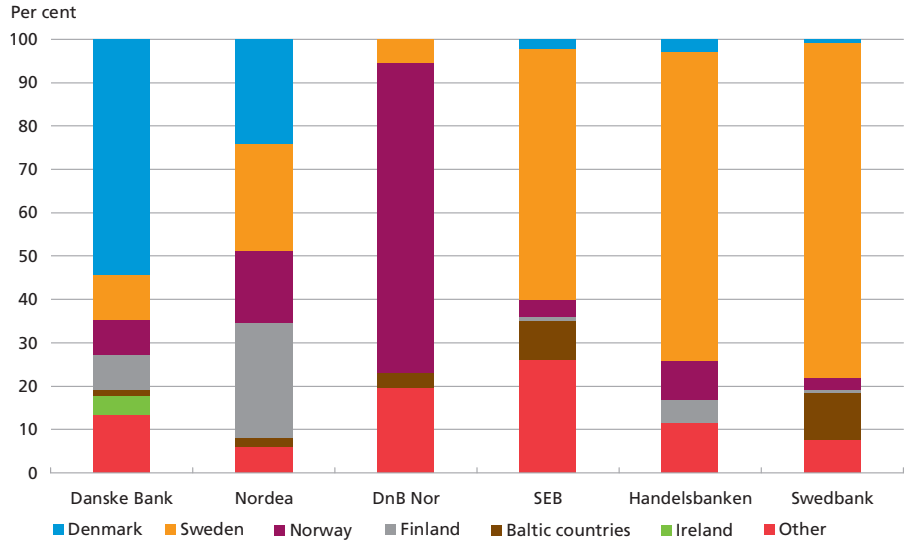
Source: Financial statements.

WRITE-DOWNS IN NORDIC BANKING GROUPS Chart 8



Source: Financial statements.

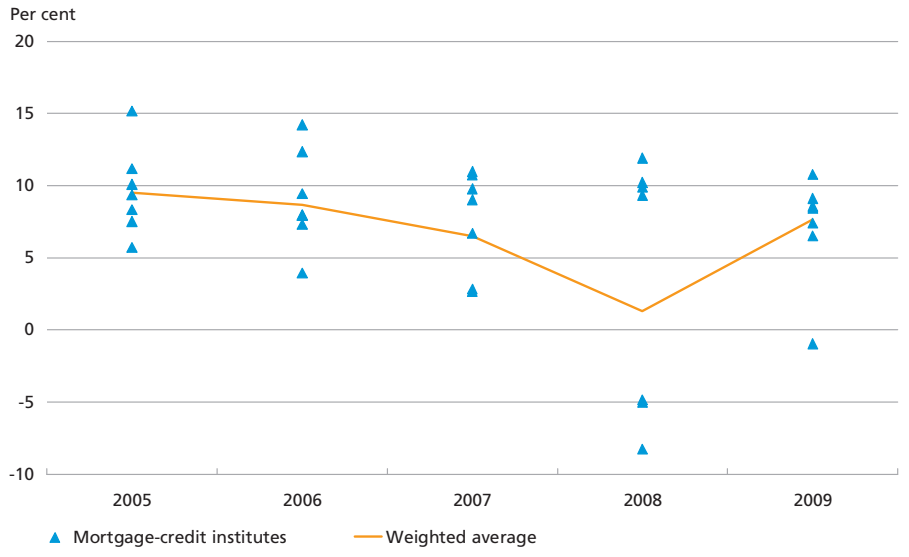
GEOGRAPHICAL DISTRIBUTION OF CREDIT EXPOSURES, END 2009 Chart 9



Note: Practices for stating the geographical distribution of credit exposures vary. If a banking institution's credit exposure to a country/region is very low, it will typically not be stated separately, but be included under "other". For example, Danske Bank is the only group among the six to state a separate credit exposure to Ireland.

Source: Financial statements.

RETURN ON EQUITY Chart 10



Note: Return on equity is calculated as the profit/loss before tax excluding income from investments in associates and group undertakings relative to average equity. The profit/loss excluding income from investments in associates and group undertakings is applied in order to focus on mortgage-credit activities, thereby excluding the activities of subsidiaries and associates.

Source: Danish Financial Supervisory Authority.

MORTGAGE-CREDIT INSTITUTES

The mortgage-credit institutes offer loans against real property as collateral, financed by issuance of bonds. On account of their size, the mortgage-credit institutes are of great significance to financial stability. Moreover, many mortgage-credit institutes are linked to other financial enterprises, either as the parent company or as a subsidiary.

The mortgage-credit institutes[1] delivered a total profit before tax (excluding income from investments in associates and group undertakings) of kr. 10 billion in 2009. This is equivalent to ROE of 7.7 per cent, which is an improvement on 2008, cf. Chart 10. The improvement of the overall result in 2009 is attributable to Nykredit, which performed considerably better than in 2008.[2] However, ROE varies for the individual institutes, ranging from 0.1 to 10.8 per cent in 2009. The spread was wider in 2008.

[1] The mortgage-credit institutes included in this section are: Realkredit Danmark, Nordea Kredit, Nykredit Realkredit, Totalkredit, DLR Kredit, BRFkredit and LR Realkredit. The latter three are not part of groups that include banking institutions in groups 1 and 2. FIH Realkredit has been omitted as its activities are being phased out.

[2] Nykredit's performance in 2008 was strongly affected by negative value adjustments, partly as a result of a widening of the yield spread between mortgage-credit and government bonds. In contrast, narrowing of the spread and falling interest rates contributed to a positive result in 2009.

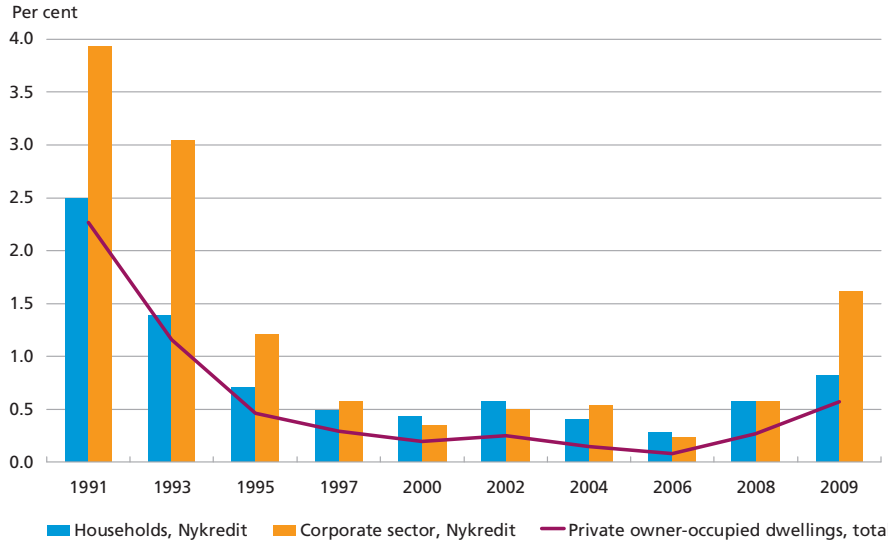
The mortgage-credit institutes' write-downs on loans increased from kr. 1.3 billion in 2008 to kr. 4.6 billion in 2009. Nevertheless, they remain low at 0.2 per cent of total lending.

Some mortgage-credit institutes have announced that they will raise their administration fees for mortgage credit in 2010. The reasons given are that falling property prices and economic activity lead to more losses on housing loans, and that the statutory capital has become more expensive to hold. In addition, differentiated prices will be introduced for new mortgage-credit loans, meaning that the administration fee will be higher for adjustable-rate than for fixed-rate loans. According to the mortgage-credit institutes this pricing structure will better reflect the risks associated with the various loan types.

Outstanding mortgage-credit loans totalled kr. 2,325 billion at end-2009, an increase by 7 per cent on end-2008. Since lending by banking institutions fell in the same period, substitution has taken place from bank loans to mortgage credit.

The arrears ratio for mortgage credit for owner-occupied housing rose in 2009, but remains low in a longer perspective, cf. Chart 11. Several mortgage-credit institutes state that write-downs have been higher on loans to the corporate sector than to households. Nykredit Realkredit has

ARREARS RATIOS — Chart 11



Note: For Nykredit Realkredit the arrears ratio has been calculated 75 days after the September due date and comprises Nykredit's mortgage credit excluding Totalkredit. The corporate sector includes all types of business enterprises, including agriculture and private rental housing, while households include private customers and part-time agriculture. The arrears ratio for private owner-occupied dwellings has been sourced from the Association of Danish Mortgage Banks, where a borrower is deemed to be in arrears if the payment deadline has been exceeded by more than 3.5 months. The ratio is calculated as arrears divided by the total payments due within the period.

Source: Association of Danish Mortgage Banks, Danish Mortgage Banks' Federation and Nykredit Realkredit.

ACTUAL SOLVENCY RATIO, CAPITAL NEED AND EXCESS CAPITAL ADEQUACY Table 2

Per cent	End-2008			End-2009		
	Actual	Need	Excess	Actual	Need	Excess
Institutions in group						
Nordea Kredit	21.5	17.8	3.7	18.5	15.0	3.5
Realkredit Danmark	56.8	40.0	16.8	44.6	24.4	20.2
Nykredit Realkredit	15.7	10.1	5.6	17.7	9.0	8.7
Totalkredit	26.7	24.0	2.7	20.2	17.8	2.4
Institutions not in group[1]						
DLR Kredit	9.7	…	…	11.7	8.0	3.7
BRFkredit	13.2	…	…	14.0	9.5	4.5
LR Realkredit	35.1	…	…	29.0	8.0	21.0

Note: Excess capital adequacy is the difference between the actual solvency ratio and the capital need. The institutions have not published their individual capital needs for 2008. Institutions applying the Internal Ratings-Based approach to calculation of credit risk are subject to an additional capital requirement during a transitional period. For these institutions, the capital need in 2008 has been defined as the requirement resulting from the transitional arrangement. For 2009 it has been defined as the individual capital need or the requirement resulting from the transitional arrangement, whichever is higher.

Source: Danish Financial Supervisory Authority and financial statements.

[1] These institutions are not part of the same groups as banking institutions in groups 1 and 2.

published arrears ratios broken down by lending to households and to the corporate sector; this data also shows greater arrears for the corporate sector. This was also the case in the early 1990s.

Almost 60 per cent of lending by mortgage-credit institutes is backed by owner-occupied dwellings as collateral. Agriculture and private rental housing account for 12 and 10 per cent, respectively, of total lending.

The solvency ratios of the mortgage-credit institutes in 2008 and 2009 are shown in Table 2. When assessing the robustness of a mortgage-credit institute, it is essential to distinguish between institutes that are subsidiaries within a group and those that are not. Subsidiaries may have modest excess capital adequacy as capital may be injected by the parent company. Several institutes strengthened their capital bases in 2009. Realkredit Danmark, BRFkredit and DLR Kredit received hybrid core capital from the government under the Credit Package, DLR Kredit increased its share capital, and Nykredit Realkredit issued hybrid core capital in the market.

THE PENSION SECTOR

Pension companies have an impact on financial stability via the capital markets, cf. Box 2, or via group links with other financial enterprises. If the reserves of a company in a group become too low, the parent company may have to inject capital.

PROCYCLICALITY IN THE INVESTMENT BEHAVIOUR OF THE PENSION SECTOR Box 2

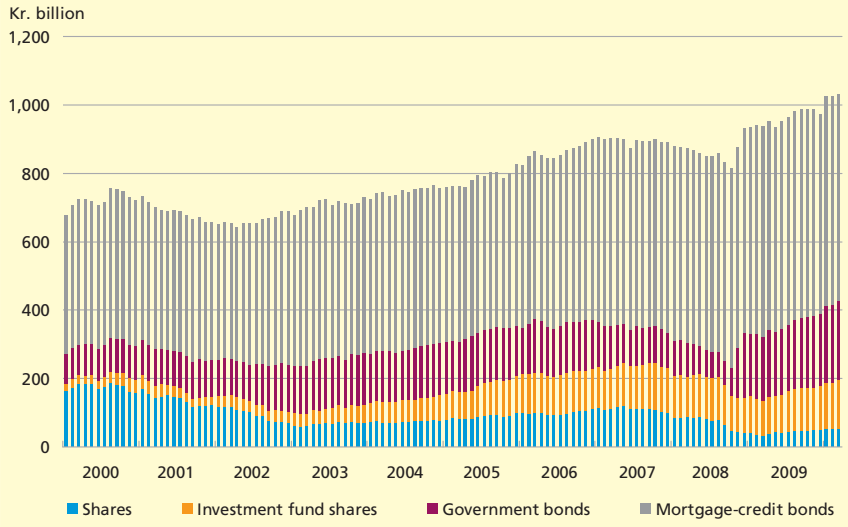
Pension companies manage considerable assets and can thus influence price formation in the financial markets. As regards domestic securities[1], insurance and pension companies (the pension sector) owned 24 per cent of mortgage-credit issues, 38 per cent of government bonds, 25 per cent of investment fund shares and 5 per cent of shares at end-March 2010. In addition, the pension sector held large portfolios of foreign shares.[2]

The pension sector's investment behaviour may have a procyclical impact and amplify market trends. This was the case in the autumn of 2008, when the unusual market conditions compelled several companies to sell part of their portfolios of Danish mortgage-credit bonds in order to meet the statutory requirements. Losses on financial assets reduced their capacity to take on risks, which in turn exerted further downward pressure on the prices of financial assets, thereby increasing the losses. This could have led to a negative spiral in the financial markets, which was the background to the agreement on financial stability in the pension area in the autumn of 2008.

Danish stock indices fell from late 2000 to early 2003 and again from late 2007 to early 2009. In such periods there is a tendency for the value of the pension sector's share portfolio to decline, as illustrated below. This is attributable to falling prices, as well as portfolio reductions.

One of the factors behind the increase in the pension sector's portfolio of government bonds from November 2008 was the decision to begin to issue 30-year government bonds, which can be used to hedge the risk on these companies' long-term commitments.

DISTRIBUTION OF THE PENSION SECTOR'S DOMESTIC SECURITIES



Note: Stocks at market value. In this context the pension sector includes insurance and pension companies. Government bonds include Treasury notes and Treasury bills.
Source: Danmarks Nationalbank.

The Danish pension companies are subject to investment rules laid down in the Financial Business Act.[3] In addition, the pension companies must consider the Danish Financial Supervisory Authority's risk scenarios, known as traffic lights, which are stress tests of the companies' finances.

CONTINUED Box 2

In future, the sector's investment behaviour will be affected by new international regulation, Solvency II. The framework directive for Solvency II was adopted by the EU in April 2009. This rule set implies that the solvency capital requirement changes from being rule-based to being risk-based. In the existing directives, the capital requirement reflects the business volume on the basis of commitments, while the capital requirement under Solvency II will reflect the risks that the companies are facing. The Danish Financial Supervisory Authority has gradually introduced measures to highlight investment risk, including the introduction of traffic lights in 2001 and the individual capital need in 2007. The purpose of the individual capital need was to introduce a more risk-based solvency requirement that better reflected the risk profile of the individual company. The risk-based approach is thus not new for Danish pension companies. Under Solvency II, companies must, however, calculate their risk on the basis of a new model, which will presumably affect investment behaviour.

A comprehensive process is underway with consultations and Quantitative Impact Studies (QIS) on the introduction of Solvency II. Solvency II is expected to be implemented at the end of 2012.

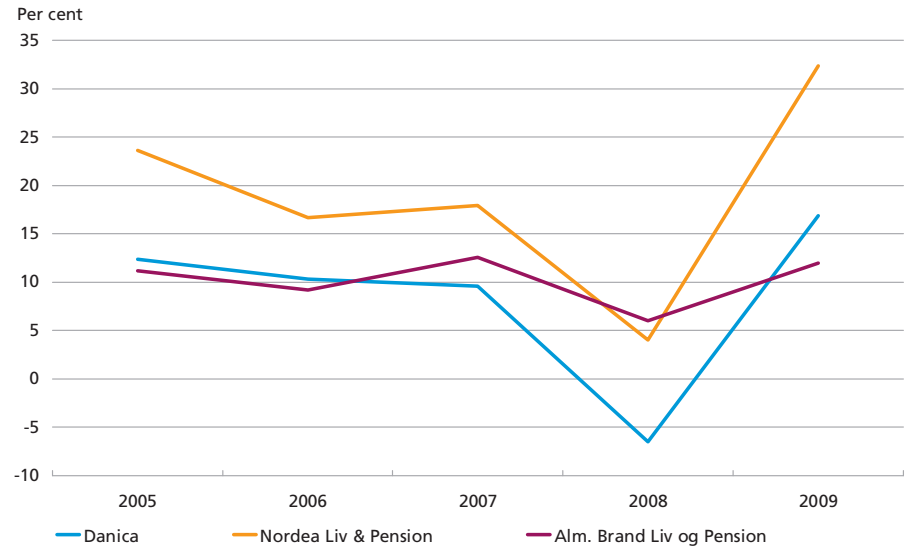
[1] Based on Danmarks Nationalbank's securities statistics, which cover bonds, equities and investment fund shares registered at VP Securities or its subsidiary in Luxembourg.
[2] For example, 80 per cent of the shares held by life insurance companies in 2008 were foreign, cf. the Danish Financial Supervisory Authority.
[3] A translation can be found at the website of the Danish Financial Supervisory Authority, www.finanstilsynet.dk.

The life insurance companies of the financial groups – Danica, Nordea Liv & Pension and Alm. Brand Liv og Pension – achieved substantially better returns on investment in 2009 than in 2008. This is attributable to higher bond prices, as well as the favourable development in stock markets since March 2009. In 2008 returns were poor and companies had to make inroads on their reserves in order to honour the announced rates of interest on policyholders' savings[1], and the companies' reserves were reduced considerably compared with previous years. In the course of 2009 the companies once again began to build up reserves, but these remain low.

The equity made available by the parent company to a life insurance company involves a risk, for which compensation is payable[2]. In addition to risk compensation, the return on the investment assets related to the equity accrues to equity. For all three companies, the total ROE was higher in 2009 than in 2008, cf. Chart 12. On account of the higher ROE and the increased reserves, the risk for the companies' owners is now lower than in 2008.

[1] This is the interest accruing to the pension company's policyholders in a given period.
[2] The risk compensation reflects the risk linked to the equity because it must be used to cover claims in the event of problems. The realised result must be sufficiently large for the company to achieve risk compensation. If no risk compensation is achieved in a given year, the amount may be transferred to a shadow account, cf. Danmarks Nationalbank, *Financial stability 2009*, 1st Half.

RETURN ON EQUITY BEFORE TAX, CONSOLIDATED Chart 12



Source: Financial statements.

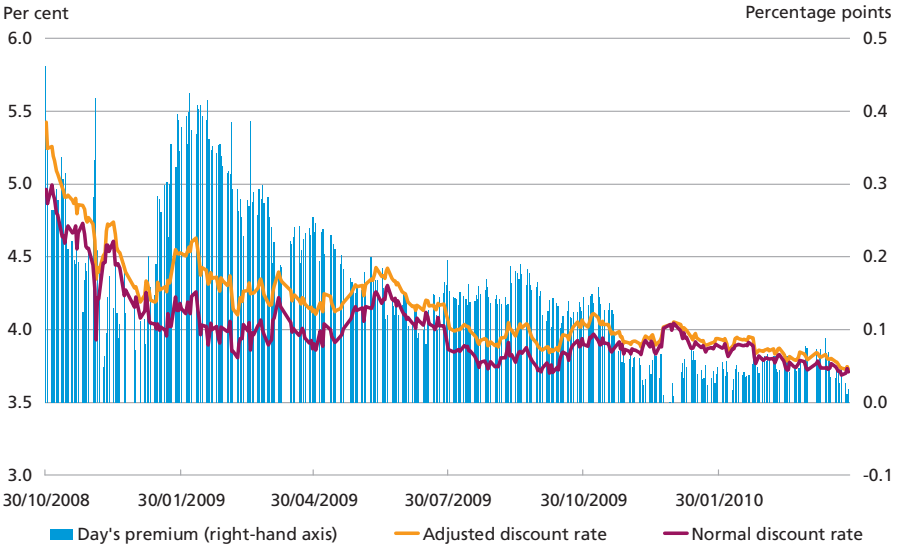
For all three companies, green light applied in 2009, as defined by the Danish Financial Supervisory Authority's risk scenarios.[1]

In October 2009, Danica and Alm. Brand Liv og Pension abolished the protection system introduced in the autumn of 2008, when the value of the assets was lower than the customers' savings. Under this system, customers wishing to leave the company are charged an extra fee. Also in October 2009, Danica and Nordea Liv & Pension increased their rates of interest on policyholders' savings because their financial reserves had increased. Both companies also increased their rates of interest on policyholders' savings with effect from 1 January 2010.

These increases and the discontinuation of the protection system are indications that the companies are performing better and that positive market developments have led to increased returns. However, the low level of interest rates means that the rates of interest on policyholders' savings remain low. As part of the agreement on financial stability in the pension area from the autumn of 2008, the pension companies have also undertaken an obligation to be more prudent, e.g. when fixing the rate of interest on policyholders' savings.

[1] The Danish Financial Supervisory Authority's risk scenarios illustrate whether there is an adequate relationship between investment risk, capital base and commitments. These scenarios are known as traffic lights. The Danish Financial Supervisory Authority has normally operated with a red and a yellow risk scenario. The red scenario shows the consequences to the company of medium negative market developments, while the yellow scenario shows the consequences of very negative market developments. The yellow traffic light was suspended in connection with the agreement on financial stability in the pension area in October 2008. A company is given a green light if it can withstand the effect of the red scenario.

10-YEAR DISCOUNT RATES Chart 13



Note: 10-year discount rates calculated according to the adjusted method (in connection with the agreement on financial stability in the pension area) and the normal method. The day's premium is calculated as the difference between the two.
Source: Danish Financial Supervisory Authority.

In connection with the agreement, a temporary adjustment was made to the method for calculating the yield curve used to discount the companies' provisions. In October 2009, the Ministry of Economic and Business Affairs and the Danish Insurance Association decided to extend the agreement for one year, until 31 December 2010. The difference between the normal and the adjusted discount rate was reduced during 2009, cf. Chart 13.

The Corporate Sector and the Households

Calculations based on Danmarks Nationalbank's failure-rate model show slightly lower estimated failure rates for companies in 2010 than in 2009. Consequently, the banking institutions are expected to post slightly lower write-downs in 2010 than in 2009. In a longer perspective, the number of compulsory liquidations remains substantial, and the need for write-downs among the banking institutions is expected to remain considerable.

The agricultural sector has been in dire financial straits in recent years. In 2010, the terms of trade are expected to improve somewhat, but the number of enforced sales is expected to rise further in 2010.

Analyses show that the overall household sector is basically robust. The households are relatively resilient against rising unemployment. However, some households are exposed to interest-rate increases as a consequence of the widespread use of adjustable-rate loans. Moreover, rising interest rates will entail a risk of falling housing prices, which can be expected to exacerbate the banking institutions' losses.

The analyses of the corporate sector and the households are based on microdata at company and household level. The results are not included directly into Danmarks Nationalbank's stress test model, which is based on the banking institutions' financial statements and macroeconomic data. However, the microdata analyses provide valuable background information for an assessment of the validity of some of the most important relations in the stress test model.

THE CORPORATE SECTOR

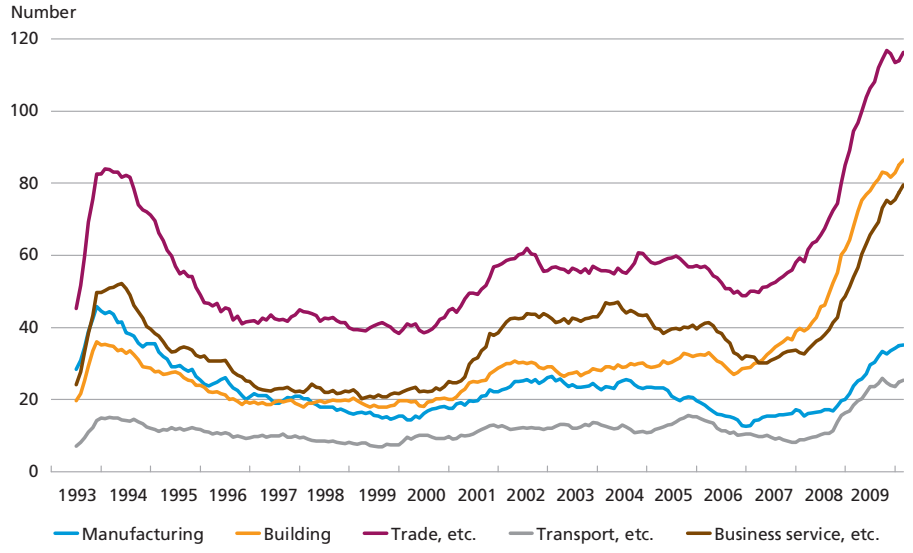
The number of compulsory liquidations rose significantly in 2008 and 2009, reaching a peak in the history of the data series. The first months of 2010 show signs of stabilisation in some sectors, cf. Chart 14.

High, but slightly declining estimated failure rates for companies

On the basis of the economic outlook, cf. Monetary Review, 1st Quarter 2010, and the companies' financial statements for 2009, Danmarks Nationalbank's failure-rate model[1] indicates slightly lower estimated failure rates

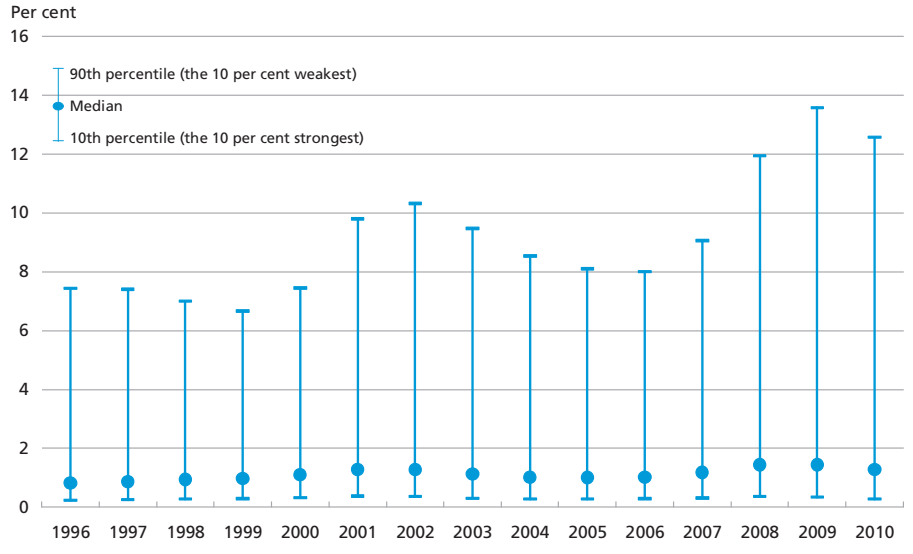
[1] Danmarks Nationalbank's failure-rate model has been used to estimate the probability of a company failing. The model is described in more detail in Financial stability 2007. The model is based on macroeconomic variables and financial statements for non-financial public and private limited liability companies. A company is deemed to have failed in the following situations: compulsorily liquidated, subject to compulsory liquidation, dissolved, compulsorily dissolved, subject to compulsory dissolution, compulsory composition confirmed or compulsory composition being negotiated.

COMPULSORY LIQUIDATIONS BROKEN DOWN BY SECTOR Chart 14



Note: Monthly data for the number of compulsory liquidations calculated as a 12-month moving average. Before January 2009, the data is census-based, while subsequent data is register-based. Manufacturing comprises industry, raw material extraction and utility services. Building comprises building and construction. Trade, etc. comprises trade, hotels and restaurants. Business service, etc. comprises information, communication and business service. Financing and insurance are not included.
Source: Statistics Denmark.

ESTIMATED FAILURE RATES FOR COMPANIES EXPRESSED BY A 10TH, 50TH AND 90TH PERCENTILE, 1996-2010 Chart 15



Note: 2010 is a preliminary estimate based on a limited proportion of the financial statements for 2009.
Source: Experian A/S, Statistics Denmark, OECD and own calculations.

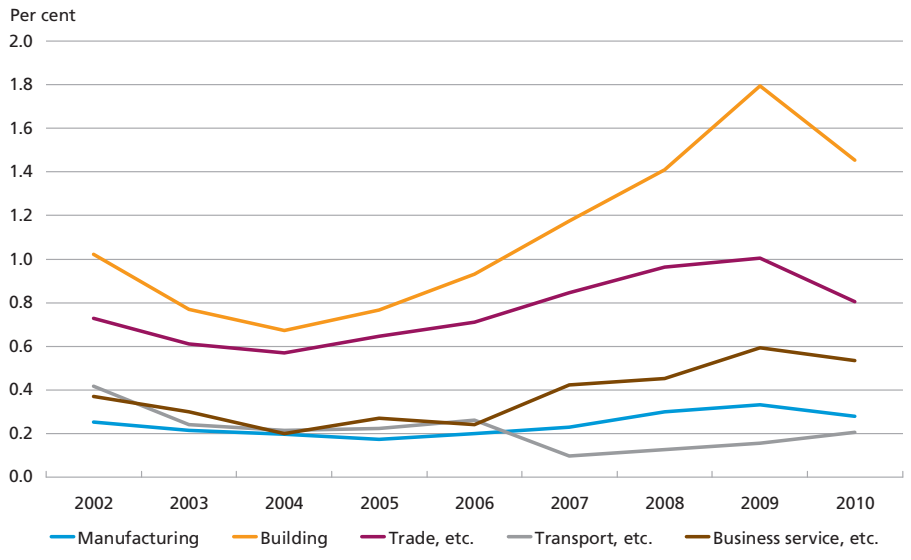
for Danish companies in 2010 than in 2009. This applies to both the median company and the most exposed companies, the latter constituting the 90th percentile, cf. Chart 15. The decline in 2010 is mainly attributable to improved economic developments. Moreover, fewer new companies were established in 2009. The estimated failure rate is generally high for newly established companies. Consequently, a small number of newly established companies will entail lower estimated failure rates for the weakest companies in particular. Despite the drop in the number of newly established companies, the most exposed companies still have the second-highest estimated failure rates in the period under review.

Considerable sectoral differences in estimated need for write-downs

The banking institutions' write-downs on loans depend on the distribution of loans to various sectors with different estimated failure rates. Weighting the debt of the individual company by the company's estimated failure rate provides a measure of the expected loss on the company, which is then aggregated to sectoral level, cf. Chart 16.

The expected loss from the failure-rate model can be interpreted as a rough estimate of the institutions' need for write-downs. However, it should be borne in mind that the institutions may take into consideration the companies' payment behaviour, etc., while the model is based solely on financial statements and macroeconomic data. Moreover, the institu-

ESTIMATED NEED FOR WRITE-DOWNS BROKEN DOWN BY SECTOR, 2002-10 Chart 16



Note: Companies in unknown sectors are excluded. The estimated failure rate for such companies is typically higher than for other companies. If a company fails, all short-term bank debt and 80 per cent of the long-term bank debt are assumed to be lost.

Source: Experian A/S, Statistics Denmark, OECD and own calculations.

THE AGRICULTURAL SECTOR'S FINANCES — Box 3

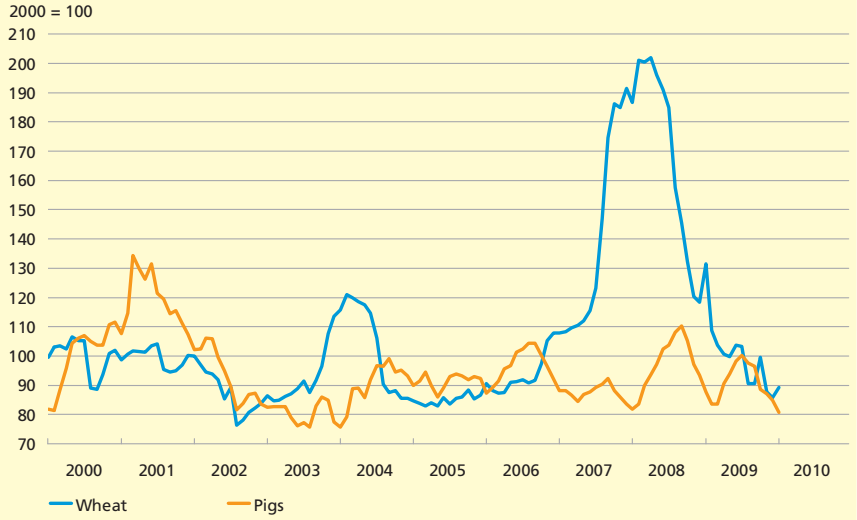
The agricultural sector has been in dire financial straits in recent years, cf. the Table. While harvests have been good worldwide, the slowdown in the global economy has reduced the demand for food. This has resulted in falling prices, cf. Chart A. The terms of trade of the sector, i.e. sales prices in relation to input prices, deteriorated by 10 per cent from 2008 to 2009. The Food and Resource Economics Institute expects an improvement of the terms of trade in 2010. The OECD/FAO also assesses that prices are unlikely to remain at the current low level in the longer term.

KEY FIGURES FOR THE AGRICULTURAL SECTOR

Kr. million	2004	2005	2006	2007	2008	2009	2010
Output value	54,167	54,298	56,023	60,363	66,672	54,586	54,654
Gross value added	18,551	18,431	18,387	17,678	17,748	13,632	16,331
+ Direct operation subsidies	6,869	7,260	7,767	7,618	7,568	7,380	7,307
- Direct and indirect taxes	1,154	977	1,041	1,017	1,073	1,120	1,192
GDP at factor cost	24,266	24,714	25,113	24,279	24,243	19,892	22,446
- Depreciation	7,310	7,302	7,535	7,813	8,159	8,580	8,961
- Paid assistance	4,827	4,672	5,047	5,352	5,733	5,835	5,940
Net residual income	12,129	12,740	12,531	11,114	10,351	5,476	7,545
- Financial costs, net	8,719	6,532	7,774	8,809	16,533	11,705	7,842
Income after financial items	3,410	6,207	4,756	2,305	-6,182	-6,229	-297

Note: Figures for 2010 and partly for 2009 are estimates from the Food and Resource Economics Institute.
Source: The Food and Resource Economics Institute, Danish Agricultural Economy 2009, January 2010, and Statistics Denmark.

THE AGRICULTURAL SECTOR'S SALES PRICES — Chart A



Source: Statistics Denmark.

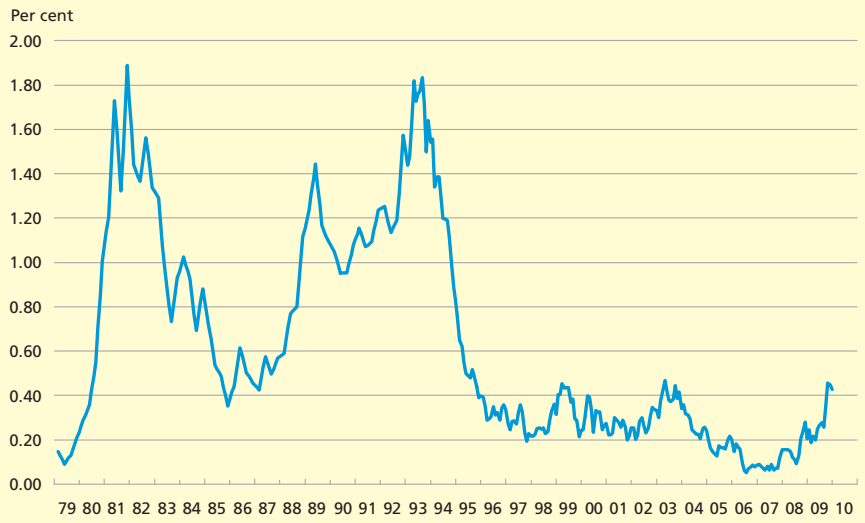
CONTINUED Box 3

At the end of 2009, the agricultural sector's debt to Danish banking institutions and mortgage-credit institutes amounted to more than kr. 325 billion or more than 15 times the sector's average gross domestic product at factor cost in the period 2000-09. The sector's debt consists mainly of adjustable-rate loans, and the rate of interest on the overall debt fell from 5.5 per cent in 2008 to 5.0 per cent in 2009. The Food and Resource Economics Institute expects an average interest rate of 3.6 per cent in 2010.

Rather than primary operation, however, secondary activities that are not related to agriculture are a key factor behind the decline in the agricultural sector's earnings in recent years. Accordingly, in 2008 the item "Financial costs, net" was burdened by extraordinary exchange-rate losses of around kr. 5 billion on currency loans, currency swaps or forward transactions, particularly in Swiss francs.

In 2006 and 2007 prices of farm properties increased at a considerably faster rate than prices of owner-occupied homes for no apparent real economic reason. The price of farm properties now reflects the sector's poor earnings, having declined by more than 20 per cent from the peak in mid-2008 up to the 3rd quarter of 2009. The large real capital gains on the properties up to the financial crisis provided a basis of existence for many farms despite their negative contribution margins. Besides, the sector's liquidity was better than immediately expressed by the financial statements, as the financial results include depreciation that has no adverse effect on liquidity.

RATE OF ENFORCED SALES FOR FARM PROPERTIES Chart B



Note: The rate of enforced sales indicates the number of enforced sales of farm properties relative to the number of farms. The rate is annualised as a 3-month moving average. Up to and including 1992, monthly data is interpolated on the basis of quarterly data.
Source: Statistics Denmark.

The rate of enforced sales for farm properties has increased over the past two years, cf. Chart B, but the level remains low compared with the situation in the early 1980s and the 1990s.

CONTINUED Box 3

Based on market expectations, short-term interest rates are likely to increase in the coming years, although the level is expected to remain relatively low. Low interest rates make a positive contribution to the finances of the agricultural sector. On the other hand, the high level of debt relative to value added obviously makes the sector highly exposed to increases in short-term interest rates, e.g. in connection with liquidity stress in the money markets.

The number of enforced sales must be expected to increase further in 2010. If a farmer is unable to service his debt, it is up to the banking institution concerned to assess on a case-by-case basis whether an arrangement with the creditors or an enforced sale is the most appropriate solution. The assessment should allow for the fact that some of the most indebted farms are also the most efficient ones.

tions and the model may apply different sectoral classifications. Finally, the model covers public and private limited liability companies only. Consequently, the model estimate of write-downs by the institutions is not fully comparable with the write-downs in the financial statements.

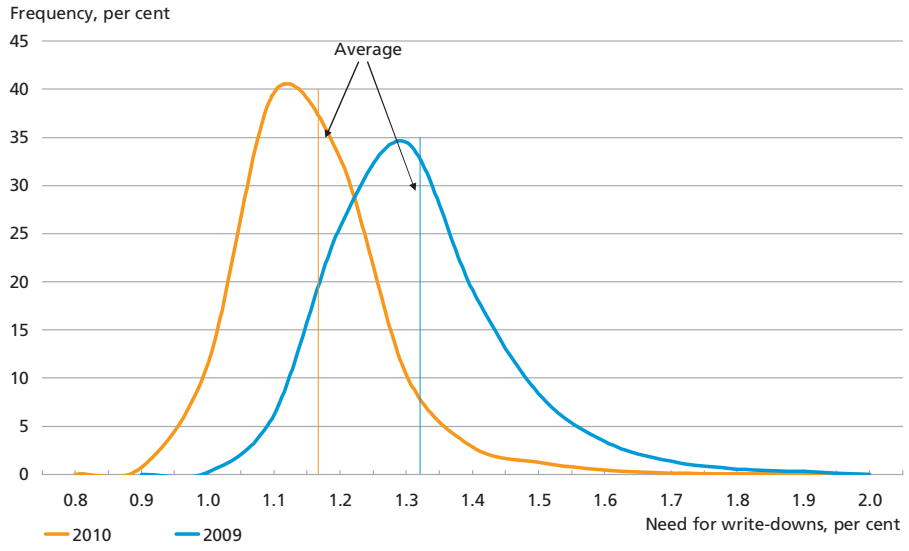
There are considerable sectoral differences in the estimated need for write-downs. It rose in 2008 and 2009 particularly for the building and trade, etc. sectors. A general decline across sectors is expected in 2010. For several sectors, the estimated need for write-downs in 2010 is on a par with the estimate for 2008.

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, cf. Box 3. In 2010, the terms of trade of the sector are expected to improve somewhat, but the number of enforced sales is expected to rise further.

Reduced uncertainty concerning the institutions' expected need for write-downs

According to Danmarks Nationalbank's failure-rate model, the need for write-downs on the banking institutions' total lending to the corporate sector will be marginally lower in 2010 than in 2009, cf. Chart 17. The distribution of the total need for write-downs is calculated on the basis of 20,000 different scenarios in which random companies are assumed to fail. The probability of failure in each scenario corresponds to the estimated failure rates of the companies. The estimated uncertainty regarding the expected need for write-downs, measured as the difference between the 95th percentile and the median of the distribution, is also lower in 2010 compared with 2009. As mentioned above, the level is not directly comparable with the financial statements of the institutions.

ESTIMATED DISTRIBUTION OF BANKING INSTITUTIONS' NEED FOR WRITE-DOWNS ON CORPORATE EXPOSURES BASED ON ESTIMATED FAILURE RATES OF 2009 AND 2010 Chart 17



Note: Write-downs are shown as a ratio of the overall debt to banking institutions. The write-down function is simulated on the basis of 20,000 different scenarios in which random companies are assumed to fail.
Source: Experian A/S, Statistics Denmark, OECD and own calculations.

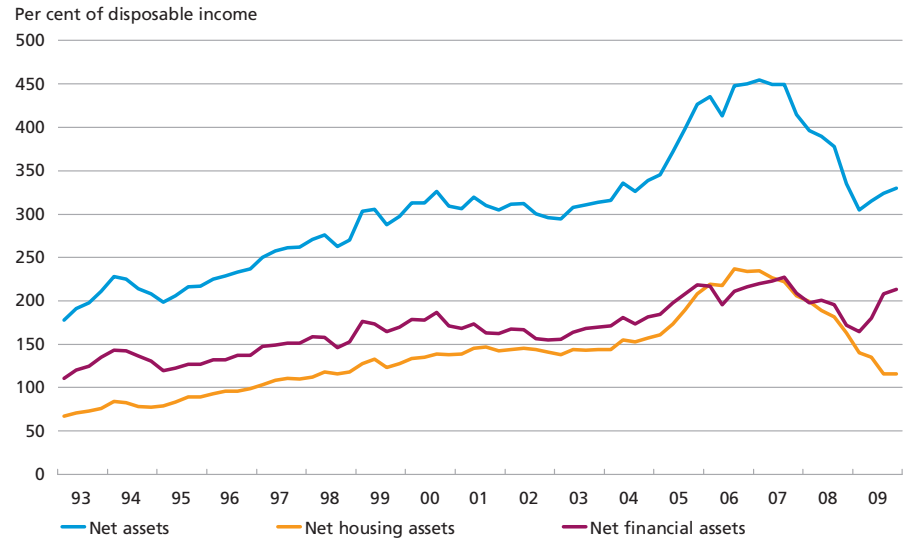
Overall, the number of actual compulsory liquidations and Danmarks Nationalbank's failure-rate model both indicate that the number of compulsory liquidations has stabilised. Consequently, the estimated need for write-downs in 2010 is slightly lower than that seen in 2009. In a longer perspective, the number of compulsory liquidations remains high. The need for write-downs among the banking institutions is expected to remain considerable, cf. the Stress Test chapter. This applies particularly to institutions that are highly exposed to the most vulnerable sectors.

HOUSEHOLDS

Household wealth has diminished over the past two years, but remains high in a longer perspective, cf. Chart 18. The most liquid assets can be realised for debt servicing purposes in the event of income reduction due to unemployment or other factors. Moreover, the wealth limits the losses of the institutions should a household default on its loans.

After a relatively long period of low losses on households, the banking institutions' losses rose in 2009, cf. Chart 19. The ability of the households to service their debt has been substantial in the preceding years. This reflects the low levels of unemployment and interest rates that have

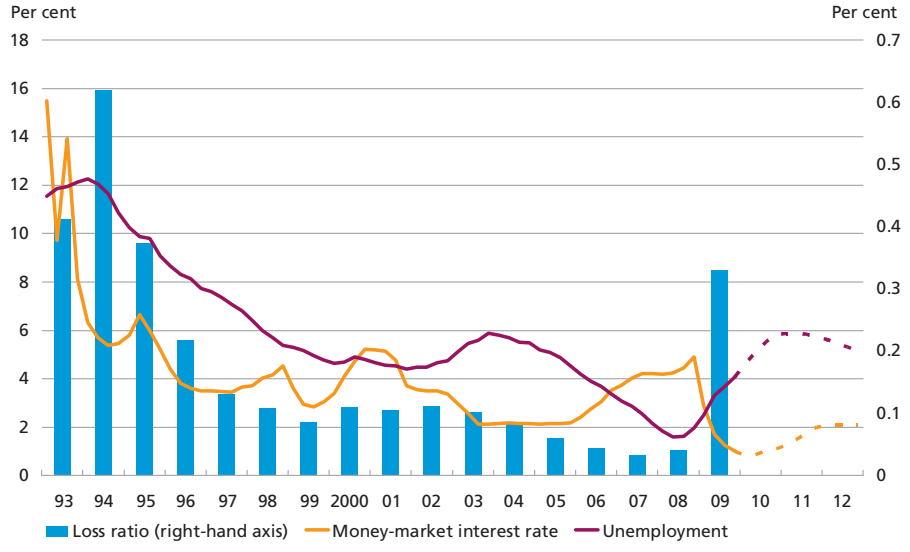
HOUSEHOLDS' ASSETS AND DEBT — Chart 18



Note: Net assets constitute the difference between the households' assets and liabilities. However, consumption assets such as cars, boats, etc. are not included. Net housing assets constitute the difference between the calculated market value of the homes and the mortgage debt. Net financial assets constitute the difference between financial assets and liabilities (excluding mortgage-credit loans). Pension assets are adjusted for estimated taxation.
Source: Danmarks Nationalbank.

provided for high incomes and low financing costs. In addition, the ability of the households to service their debt has been supported by substantial wealth, cf. Chart 18.

BANKING INSTITUTIONS' LOSS RATIO ON HOUSEHOLDS, UNEMPLOYMENT AND MONEY-MARKET INTEREST RATES — Chart 19



Note: The dotted lines indicate the baseline scenario for the variables, cf. the Stress Test chapter.
Source: The Danish Financial Supervisory Authority and Danmarks Nationalbank.

Unemployment has increased since 2008, and the baseline scenario operates with rising unemployment and interest rates in the coming years, cf. the Stress Test chapter. Higher unemployment will reduce the disposable incomes of the households in question. Similarly, higher interest rates will entail higher interest costs for households with adjustable-rate debt. The households' growing use of adjustable-rate loans has increased their interest-rate exposure in recent years. At the beginning of 2010, adjustable-rate loans accounted for 60 per cent of the households' total mortgage-credit loans. For the vast majority of the households with adjustable-rate loans, the rate of interest for the subsequent year is fixed at the end of the year. For those households, the interest rate at end-2008 determined the interest costs in 2009, while the low level of interest rates at end-2009 will not be fully reflected in interest costs until 2010.

The baseline scenario shows rising unemployment and interest rates in the coming years, cf. the Stress Test chapter. Nevertheless, unemployment and particularly interest rates are still low in the baseline scenario compared with the last 15 years. Overall, the households are therefore expected to remain robust.

An apparently robust picture of the sector as a whole may conceal a group of households with particularly tight finances. To obtain a full view of the households' impact on financial stability it is necessary to consider incomes and financial obligations in more detail. In addition, due to structural changes such as the more widespread use of adjustable-rate loans, historical correlations at the macro level may no longer provide a true and fair view of the risks associated with lending to households.

Consequently, it is discussed how falling housing prices and increases in the levels of interest rates and unemployment will impact the distribution of the debt at household level. This gives a micro-based indication of the losses the institutions can be expected to incur on household lending in different scenarios.

Financially vulnerable households

The ability of households to service their debt can be summarised as the financial margin, cf. Table 3.

A household with a financial margin of zero cannot afford to repay its debt at minimum consumption. Consequently, a household with a negative financial margin is assumed to be unable to service its debt. This assumption excludes a large number of elements. For example, a household will not necessarily cut down its consumption to the fixed minimum before defaulting on the debt. Nor does the financial margin allow for the fact that a household can liquidate its assets before defaulting on its debt. Nevertheless, an analysis of the financial margin

DEFINITION OF THE FINANCIAL MARGIN — Table 3

Financial margin	=	The households' disposable income after net interest costs and tax - Housing-related costs (excluding repayments on loans) - Minimum consumption costs

Note: The households' disposable incomes are data extracts from Statistics Denmark including income, asset and debt information for all households. Housing-related costs are extracted from Statistics Denmark's consumption survey and broken down by households according to income and homeownership. Consumption costs are based on the basic budget of the Centre for Alternative Social Analysis, CASA. This standardised consumption budget excludes expenditure for consumer durables and holidays, cf. *Financial Stability 2007*.

provides a general picture of the households' ability to service their debt.

Based on the financial margin, the number of financially vulnerable households corresponds to 3.4 per cent of all households according to the calculations below. The financially vulnerable households account for 3.2 per cent of total debt, cf. Table 4.

The financially vulnerable households are mainly young people who are living in rented homes and whose gross income is low. Interest rates are very low from the outset, and therefore the ability of homeowners in particular to repay their debt is high.

Danmarks Nationalbank has made calculations illustrating how changes in the level of unemployment, interest rates and housing prices affect the disposable incomes and wealth of households and thereby the expected losses of the banking institutions and the mortgage-credit institutes. The calculation method and basis are described in more detail in Box 4.

The calculations show the percentage of total household debt that is attributable to households with a negative financial margin in the event of rising unemployment and interest rates, cf. Table 5.

KEY PARAMETERS FOR HOUSEHOLDS — Table 4

	Financial vulnerable households	Other households
Percentage of population	3.4	96.6
Percentage of total debt	3.2	96.8
Percentage of total assets	2.4	97.6
Gross income per taxpayer – median, kr.	122,782	359,538
Interest burden, median, per cent.	3.0	3.9
Income gearing – median	1.3	2.2
Average age	31.1	42.5
Percentage of homeowners	28.2	59.7

Note: Interest burden is defined as interest costs divided by gross income. Income gearing is total debt divided by gross income. The data has been projected from 2007 to 2009, allowing for the development in incomes and prices and the level of unemployment.

Source: Statistics Denmark, Centre for Alternative Social Analysis and own calculations.

HOUSEHOLD ANALYSIS CALCULATION METHOD AND BASIS Box 4

Data

The main source is a data extract from Statistics Denmark including a cross-section of all 2,781,157 households at end-2007. The data extract contains information on incomes, expenditure, assets and liabilities at household level based on notices of assessment from the Danish Tax and Customs Administration.

Pensioners, early retirement benefit recipients and students have been excluded as their level of indebtedness is low. Self-employed persons have been excluded due to their structural deviation from other households. After this selection, the data includes 1,525,896 households.

As the data extract does not specify the households with debt at adjustable interest rates, a distribution is applied which allocates adjustable-rate debt based on mortgaging ratio and geographical location, cf. p. 68 of Financial Stability 2009, 1st half.

Sensitivity analyses of incomes and assets

Monte Carlo simulations are applied to determine which households have adjustable-rate debt and will be hit by unemployment if the general rate of unemployment rises. The simulations are mutually independent.

In addition, the exposure of banking institutions and mortgage-credit institutes to households is calculated according to three dimensions: interest costs and income, loss of employment and changes in housing prices.

If a household has been allocated adjustable-rate mortgage-credit debt, it is assumed that its home is financed by a 1-year adjustable-rate loan and that the related interest rate is in line with the development in the short-term money-market rate. Furthermore, it is assumed that interest rates on debt and deposits in banking institutions are also adjustable and in line with the development in the short-term money-market rate. When a household in employment is hit by unemployment, it is assumed that the entire earned income is lost when one person in the household is employed. If two members of the household are employed, it is assumed that half of the earned income is lost if only one member of the household becomes unemployed. If both members of the household become unemployed, the entire earned income is lost. The households hit by unemployment are then allocated either cash benefits or unemployment benefits.

When the value of the households' housing assets changes, it is assumed that the market value of all homes follows the general development in housing prices. This means that differences in housing prices broken down by geographical location or type of home are not taken into account.

Calculating the estimated loss level of banking institutions and mortgage-credit institutes

After the above calculations, households with a negative financial margin can be identified. They are expected to inflict losses on the credit institutions if their debt exceeds the liquidation value of their assets. The loss is then calculated as the difference between the value of the debt and the liquidation value of the assets.

Some households are vulnerable to changes in interest rates. A rise in interest rates by 2 percentage points would increase the proportion of the total debt of financially vulnerable households by about 1 percentage point.

FINANCIALLY VULNERABLE HOUSEHOLDS' SHARE OF TOTAL DEBT Table 5

	Point of departure	Increase in interest rates			
		1 percentage point	2 percentage points	3 percentage points	4 percentage points
Point of departure	3.2	3.7	4.3	5.1	6.1
Unemployment increases by 1 percentage point	3.3	3.7	4.4	5.2	6.2
Unemployment increases by 3 percentage points	3.4	3.9	4.6	5.4	6.4
Unemployment increases by 5 percentage points	3.6	4.1	4.8	5.6	6.7

Note: 200 iterations have been made in all scenarios. The data shows the median for each scenario. The point of departure has been projected from 2007 to 2009, allowing for the development in incomes and prices and the level of unemployment.
Source: Statistics Denmark, Centre for Alternative Social Analysis and own calculations.

Furthermore, the households are relatively resilient to rising unemployment, primarily because unemployment benefits and cash benefits replace their earned income to some extent.

Typically, higher interest rates will also lead to falling housing prices as increased financing costs reduce the demand for housing. As the banking institutions and mortgage-credit institutes' lending is to a large extent collateralised by household-owned homes, their losses on defaulted loans will increase when housing prices fall. Rising interest rates will thus typically affect the institutions' losses on households in two ways. Firstly, more households will default on their debt. Secondly, defaulting on loans will lead to greater losses.

Based on the calculation assumptions in Box 4, where all households with a negative financial margin are assumed to default on their debt, it is possible to estimate the impact of concurrent interest-rate increases and falling housing prices on the losses of banking institutions and mortgage-credit institutes, cf. Table 6. The loss ratios are not directly comparable with the institutions' expected losses on households. This reflects the fac-

ESTIMATED LOSS RATIOS Table 6

	Point of departure	Increase in interest rates			
		1 percentage point	2 percentage points	3 percentage points	4 percentage points
Point of departure	0.9	1.0	1.3	1.5	1.8
Housing prices fall by 10 per cent	1.0	1.2	1.5	1.8	2.1
Housing prices fall by 20 per cent	1.2	1.4	1.7	2.1	2.5
Housing prices fall by 30 per cent	1.4	1.6	2.0	2.4	2.9

Note: 200 iterations have been made in all scenarios. The data shows the median for each scenario. The point of departure has been projected from 2007 to 2009, allowing for the development in incomes and prices and the level of unemployment. Unemployment is kept constant in the scenarios.
Source: Statistics Denmark, Centre for Alternative Social Analysis and own calculations.

tors that are omitted when calculating the financial margin, cf. Table 3, and the fact that the data basis does not contain information on the households' other assets such as cars and boats that may also be pledged as collateral.

The estimated loss ratios, like the share of debt in financially vulnerable households, are sensitive to interest-rate fluctuations. If only few households with low housing wealth default on their debt, falling housing prices have no major effect. However, the effect increases significantly when interest rates increase and more households become financially vulnerable.

Overall, the analysis indicates that the future risk of banking institutions and mortgage-credit institutes on household exposures is mainly related to increases in short-term interest rates. The risk is reinforced by concurrent declines in housing prices. Overall, however, the households remain robust.

Stress Test

During 2009, most of the large Danish banking institutions strengthened their capital bases, and the institutions are now better prepared to withstand write-downs. Write-downs will still be substantial, but declining as a consequence of the improved economic outlook. The large Danish banking institutions are generally considered to have sufficient capital buffers to weather the expected economic development until 2012. A few institutions, however, may be faced with write-downs of such magnitude that they will find it difficult to meet the statutory solvency requirement.

In the stress test, the banking institutions are exposed to negative shocks to the economy in three scenarios. The scenarios are seen as low probability events and illustrate the resilience of the banking institutions. The stress test shows that in the most severe scenarios write-downs are so large that many institutions will need to strengthen their capital bases towards the end of the period. For a few institutions, this could be relevant already in 2011.

Danmarks Nationalbank's stress test model thus shows that the institutions overall hold sufficient capital in the most likely outcome, but if the economy develops more negatively than expected, a significant number of institutions may need to strengthen their capital bases. Assessments of write-downs two years ahead are associated with substantial uncertainty. The stress test does not prompt Danmarks Nationalbank to suggest new initiatives at present.

SCENARIOS

Danmarks Nationalbank's stress test provides the basis for a general assessment of the resilience of the financial sector.[1] The stress test is based on 14 of the largest banking institutions. For the first time, Sparekassen Sjælland has been included in the calculations. Forstædernes Bank and Nykredit Bank merged as from 1 April 2010 and are thus included in the calculations as one bank. Developments in the financial sector are modelled in four scenarios – a baseline and three stress scenarios – over the period from 2010 to 2012.

[1] For a description of Danmarks Nationalbank's stress test model, see *Financial Stability 2008*.

Baseline scenario

The baseline scenario is the most recent forecast for the Danish economy published by Danmarks Nationalbank. For a more detailed description of the forecast, see *Monetary Review*, *1st Quarter 2010*. The baseline scenario reflects the development in the Danish economy and the financial sector considered most likely. Relative to the forecast applied in *Stress Tests, 2nd Half 2009*, the differences are only marginal, cf. Table 7.

In line with the economies of most western countries, the Danish economy is recovering from the sharp setback in 2008 and the 1st half of 2009. The recession was replaced by modest positive growth in the gross domestic product, GDP, in both the 3rd and 4th quarter, and growth is expected to rise gradually in the period, cf. Chart 20. Excess capacity in the corporate sector is significant, which implies that employment continues to fall even though production has increased. In the baseline scenario, unemployment is expected to rise in the coming quarters and reverse during 2011, cf. Chart 21. Based on the most recently published unemployment data, the jobless rate is likely to be slightly lower, but this is not assumed to be of crucial importance to the results of the stress test.

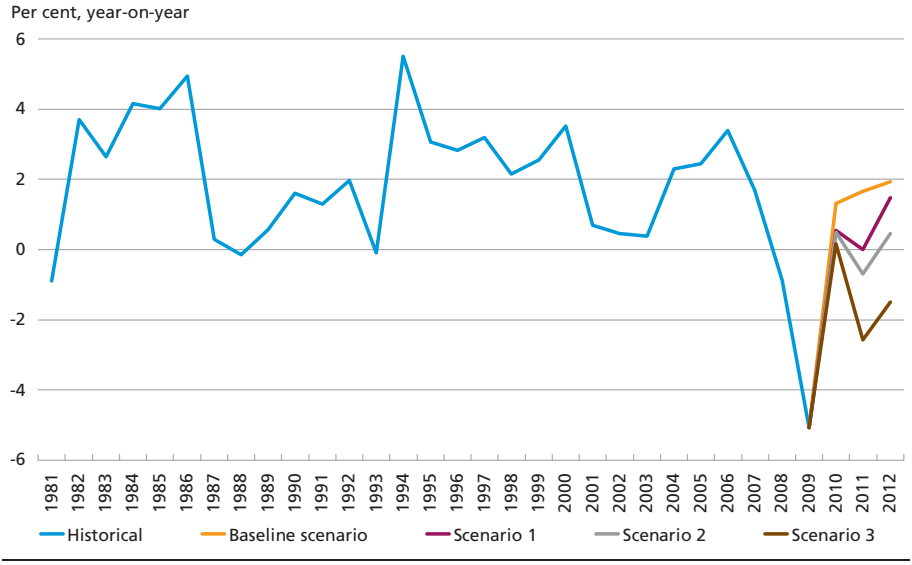
Stress scenarios

To test the financial sector's resilience towards negative shocks to the economy, the baseline scenario is supplemented by three stress scenarios. Scenarios 1 and 3 are updates of scenarios 1 and 3 presented in *Stress Tests, 2nd Half 2009*. Via an international debt crisis scenario, scenario 2

COMPARISON OF THE BASELINE SCENARIO — Table 7

	Financial Stability, 2010	Stress Tests, 2nd Half 2009
2010		
GDP, per cent year,-on-year	1.3	1.2
Unemployment rate, per cent	5.3	5.5
Bond yield, per cent p.a.	3.4	4.2
3-month money market interest rate, per cent p.a.	0.9	1.5
2011		
GDP, per cent year-on-year	1.7	1.6
Unemployment, per cent	5.8	6.0
Bond yield, per cent p.a.	4.1	4.8
3-month money market interest rate, per cent p.a.	1.6	2.7
2012		
GDP, per cent year-on-year	1.9	•
Unemployment rate, per cent	5.4	•
Average bond yield, per cent p.a.	4.8	•
3-month money market interest rate, per cent p.a.	2.0	•

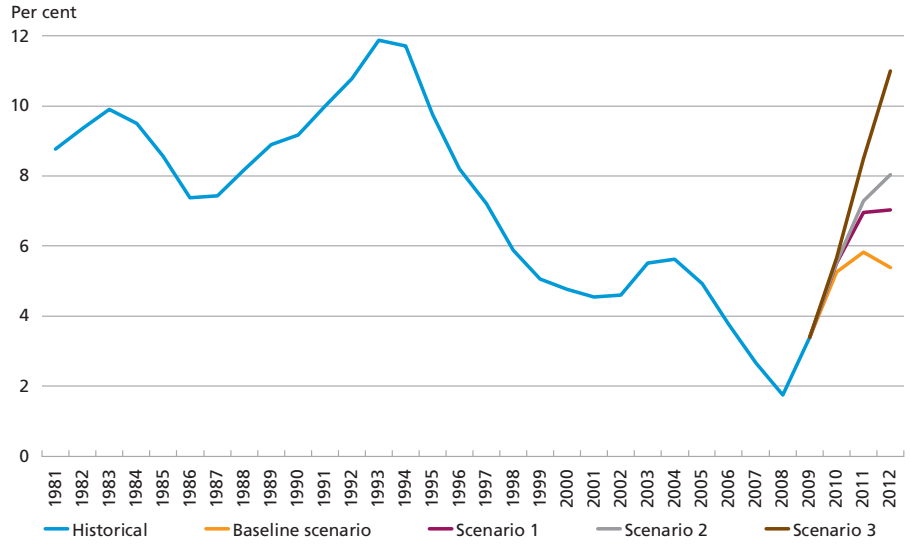
GROWTH IN REAL GDP Chart 20



Source: Statistics Denmark and own calculations.

reflects risks associated with the recent massive growth in several countries' public debt. The stress scenarios are seen as low probability events and illustrate the resilience of the banking institutions.

UNEMPLOYMENT Chart 21



Source: Statistics Denmark and own calculations.

Scenario 1: Aggravated financial crisis and confidence crisis in the Danish economy

Tight credit policies in the banking institutions combined with concerned consumers lead to further declines in consumption, house prices and, not least, private sector investment. In this scenario, unemployment rises to 7 per cent in 2012, while house prices fall by almost 15 per cent over the three years.

Scenario 2: International debt crisis

The domestic debt crisis from scenario 1 is combined with an international debt crisis, which leads to higher long-term interest rates in Denmark and abroad. Specifically, the average bond yield is increased by a total of 2 percentage points from 2010 to 2011, and growth in export markets recedes by approximately 2 percentage points annually. Unemployment increases to 8 per cent in 2012, and average bond yields rise to 6.8 per cent. Moreover, GDP growth fluctuates around zero per cent, and house prices will fall by more than 20 per cent.

Scenario 3: Long and strong Danish and international recession

The domestic credit and confidence crisis in scenario 1 is combined with an international setback. The global economy is exposed to contraction at end-2010 and subsequently stagnation. The domestic credit and confidence crisis worsens and lengthens, and the housing market deteriorates further. Unemployment rises to 11 per cent in 2012, and house prices decline by more than 25 per cent in the period 2010-12. After the zero growth outcome in 2010, GDP growth becomes negative in both 2011 and 2012.

Macroeconomic developments in the baseline scenario and the three stress scenarios are specified in Table 1, page 83.

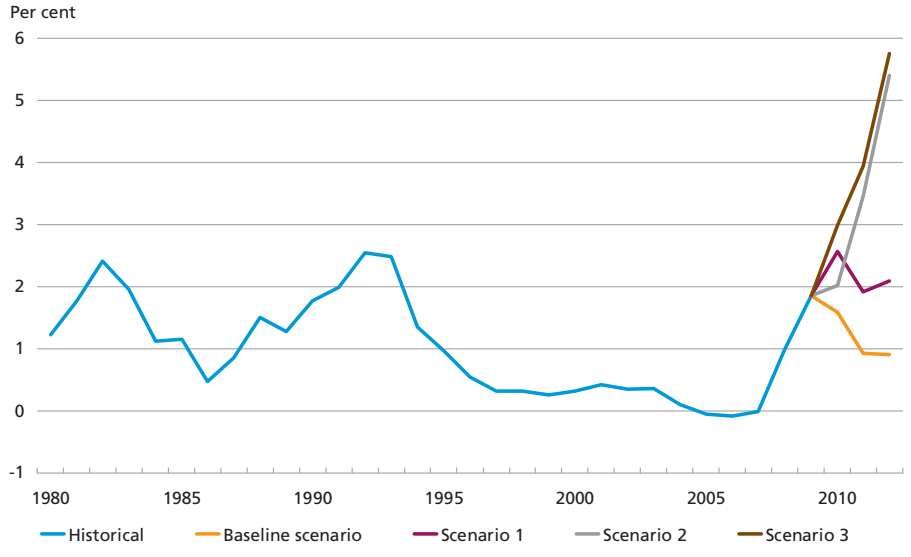
RESULTS

Danmarks Nationalbank's stress test model is a solvency model. This means that a banking institution survives as long as it is solvent. The model's results should therefore be interpreted with caution. For example, the stress test model does not take liquidity risk into account, including the fact that, during some periods, the banking institutions may be unable to raise funds in the capital markets. The liquidity situation of banking institutions is discussed in the chapter on liquidity.

Current earnings of banking institutions

The banking institutions in the stress test population reported high core earnings in 2009, which gives the institutions bigger buffers against write-

AGGREGATED WRITE-DOWN RATIOS Chart 22



Note: Weighted averages. The historical series is based on the Danish Financial Supervisory Authority's groups 1-3, while the observation for 2009 and the estimated write-downs in 2010-12 apply to the institutions in the stress test.
Source: Baldvinsson et al., *Dansk Bankvæsen* (Danish Banking – in Danish only), 5th edition, Forlaget Thomson, 2005, Danish Financial Supervisory Authority and own calculations.

downs on loans. In the period 2010-12, income in the baseline scenario as wells as scenarios 1 and 2 is expected to remain high. This development is primarily driven by rising net interest income. In scenario 3, income is not expected to reach the same high level as in the other scenarios due to the low interest rate level. Payments to the Bank Rescue Package will cease from 1 October 2010, which will have a positive effect on the banking institutions' earnings in all scenarios in 2011-12.[1]

Write-downs by banking institutions

Despite the high core earnings, the level of write-downs is crucial for the banking institutions' profits, and economic developments clearly feed through to write-down ratios, cf. Chart 22. In the baseline scenario, write-downs are expected to fall from 1.9 per cent in 2009 to 1.6 per cent in 2010 and subsequently decline to just under 1 per cent in 2011 and 2012. In scenario 1, the write-down ratio rises to 2.6 per cent in 2010, declines slightly in 2011 to rebound a little in 2012. In scenarios 2 and 3, the write-downs increase throughout the period and reach a very high level by 2012. The high level in the two scenarios is due to several years' strong

[1] With the expiry of the Bank Rescue Package, the banking institutions will be allowed to pay dividend again. The stress test model assumes that the institutions do not pay dividend. The assumption is only of minor importance, as a number of institutions are expected to be loss-making, particularly in the stress scenarios.

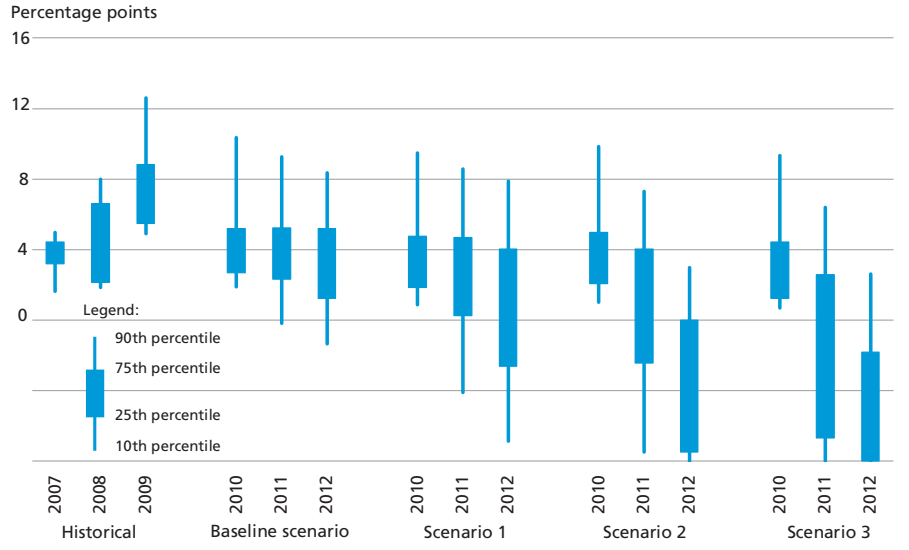
pressure on the economy from declining house prices and rising unemployment. Therefore, the quality of the banking institutions' loans and underlying collateral will have deteriorated markedly. At the same time, higher interest rates will, in isolation, lead to a drastic increase in write-down ratios.

Capitalisation of banking institutions

The banking institutions' excess capital adequacy improved significantly in 2009. One of the reasons was that several banking institutions received government capital injections in 2009 in the form of hybrid core capital under the Credit Package, while others raised new capital via the market or a parent company. However, the continued high write-down ratios expected in 2010 lead to pressure on the banking institutions' results. In 2009, a large number of banking institutions reported negative pre-tax results, and this is also the case in 2010 in both the baseline scenario and the three stress scenarios. In the baseline scenario, however, this development is expected to turn around in 2011 and 2012, while there will be many banking institutions reporting negative results throughout the period in the three stress scenarios, particularly in scenarios 2 and 3.

The institutions' results feed directly through to capitalisation. In both the baseline and the stress scenarios, the excess capital adequacy of the banking institutions decreases throughout the period, cf. Chart 23. In the baseline scenario and scenario 1, some institutions are expected to en-

EXCESS CAPITAL ADEQUACY — Chart 23



Source: Danish Financial Supervisory Authority and own calculations.

counter problems meeting the statutory solvency requirement in 2011 and 2012, but most of them will pull through the period. In scenarios 2 and 3, more institutions will be struggling to meet the statutory requirements by the end of 2011, while the capital adequacy of most of the institutions will fall below the statutory requirement in 2012.

Compared with the excess capital adequacy in *Stress Tests, 2nd Half 2009*, the banking institutions are now doing a little better in 2010 and 2011. The institutions' 2009 earnings were slightly ahead of expectations, which has contributed to improving ratios. Furthermore, the macroeconomic outlook has improved slightly, which also affects the institutions' earnings and need for write-downs. Relative to *Stress Tests, 2nd Half 2009*, another year has been added to the period. 2012 is a very tough year in the stress scenarios, as it comes after several poor-performing years. This is reflected in the write-down ratios and capitalisation of the banking institutions at the end of the period.

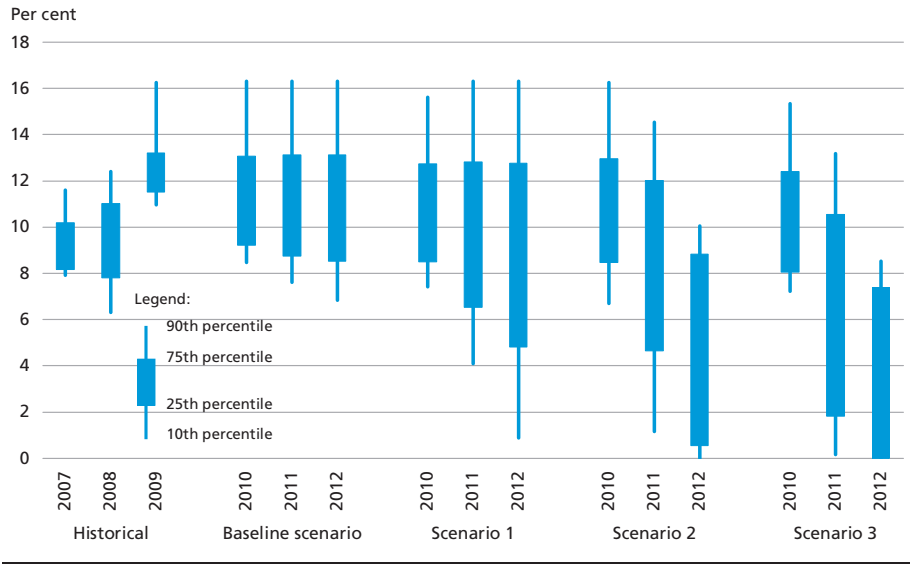
In the assessment of the institutions' resilience, it is important to remember that several of the institutions analysed are subsidiaries of large groups. This applies to Nordea Bank Danmark, Nykredit Bank and Alm. Brand Bank. The excess capital adequacy of these institutions may be low because capital is placed in the parent company, and consequently they do not perform well in the stress test. The parent company is expected to support its subsidiary, if necessary. The subsidiaries are therefore likely to be more resilient than they seem. Since it is uncertain to which extent the parent company, which is also expected to be affected by the stress scenarios, is able to support the subsidiary, the stress test does not take this possibility into account.

Quality of the capital

The financial crisis has illustrated that the financial sector was not sufficiently capitalised to withstand the economic development. On an international scale, there is agreement that it is necessary to strengthen credit institutions' capital base. Both the Basel Committee and the European Commission have presented proposals on how to strengthen the quality, consistency and transparency of the banking institutions' capital. Importance is particularly attached to the part of the Tier 1 capital that comprises common equity and retained earnings. None of the proposals have been adopted yet.[1]

[1] For a more detailed account of the regulatory initiatives, please see Borka Babic and Anne-Sofie Reng Rasmussen, Regulatory Initiatives in the Financial Sector, Danmarks Nationalbank, *Monetary Review* 1st Quarter 2010. A database of regulatory initiatives in a number of areas monitored by Danmarks Nationalbank can be found at Danmarks Nationalbank's website, www.nationalbanken.dk.

TIER 1 RATIOS Chart 24



Note: The Tier 1 ratio must constitute at least 50 per cent of the capital base; hence the Tier 1 capital must constitute at least 4 per cent of a banking institution's risk-weighted assets.
Source: Danish Financial Supervisory Authority and own calculations.

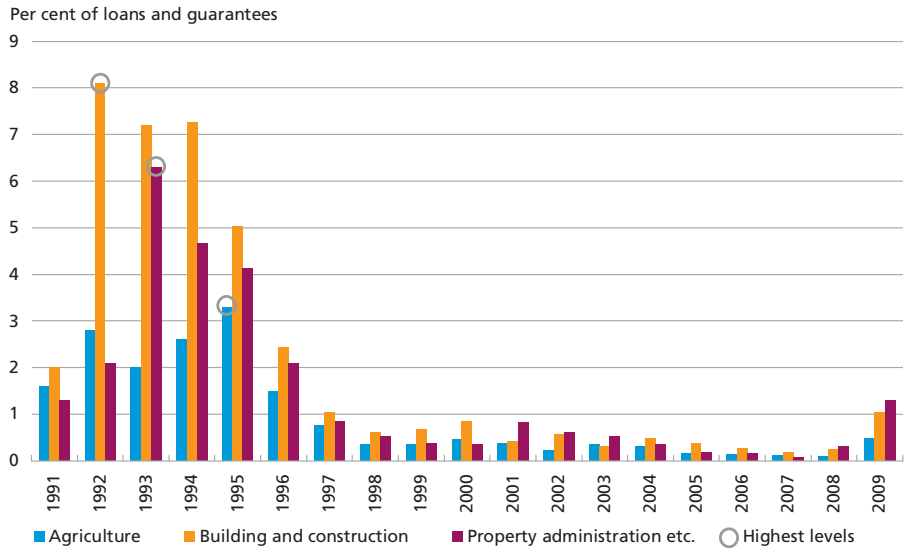
During the crisis, focus has increasingly shifted from the institutions' capital base and excess capital adequacy towards Tier 1 capital and non-hybrid core capital. Several of the institutions in the stress test have obtained capital via the Credit Package, the market or a parent company, which has resulted in significant increases in their Tier 1 capital in 2009. In the stress scenarios, the institutions' Tier 1 capital primarily comes under serious pressure towards the end of the period, but some institutions will face problems already in 2011, cf. Chart 24.

Sensitivity analysis of major write-downs for selected industries

The chapter on the corporate sector and the households states that the biggest need for write-downs in 2010 is expected in the construction sector and that the number of enforced sales in agriculture is expected to rise in 2010. Furthermore, the property sector has seen a significant need for write-downs during the current crisis.

The banking institutions' loss ratios over the past 20 years for the sectors agriculture, property administration etc. and building and construction appear from Chart 25. The following is a calculation of the excess capital adequacy in the baseline scenario of the stress test if the write-down ratios in the three sectors in each of the years 2010-12 reach a level corresponding to the highest sector ratios observed since 1991. Furthermore, the effect of increasing the write-down ratios in each of the years 2010-12

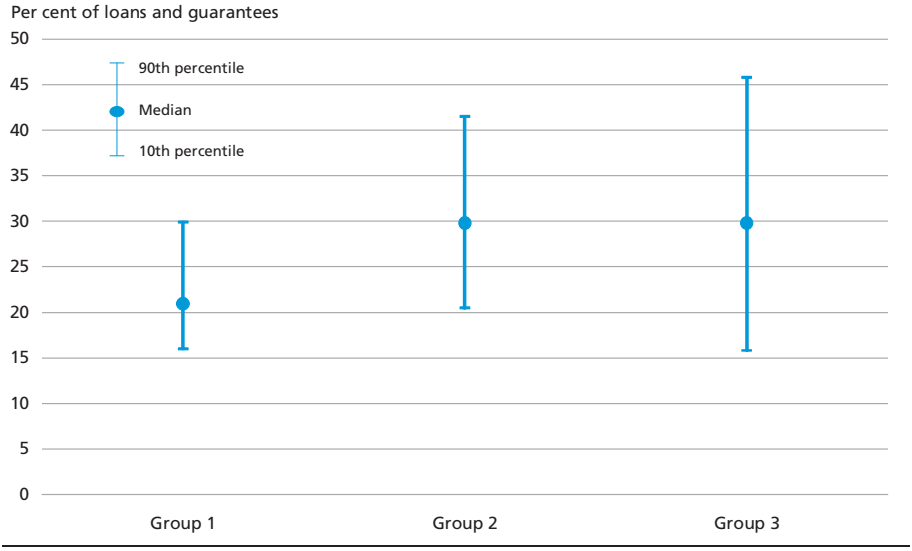
HISTORICAL LOSSES Chart 25



Note: Note: Property administration etc. also covers the sector property administration and sale, business service.
Source: Danish Financial Supervisory Authority, Ministry of Economic Affairs, *Den danske pengeinstitutsektor* (The Danish Banking Sector – in Danish only), 1994 and Baldvinsson et al., *Dansk Bankvæsen* (Danish Banking – in Danish only), 5th edition, Forlaget Thomson, 2005.

to double the maximum level observed in the period 1991-2009 is calculated. The other write-down ratios are kept constant relative to the baseline scenario previously outlined in this chapter.

EXPOSURE TO AGRICULTURE, PROPERTY ADMINISTRATION ETC. AND BUILDING AND CONSTRUCTION, END-2009 Chart 26



Note: Overall, the exposure of group 1 to the selected sectors is 17 per cent, group 2's exposure is 30 per cent and group 3's exposure is 33 per cent of loans and guarantees.
Source: Source: Danish Financial Supervisory Authority.

The effect of the increased write-down ratios depends on the exposure to the selected sectors. The exposure of individual banking institutions to various sectors differs widely in groups 1, 2 and 3. A number of the small institutions in group 3 are even more exposed to the sectors mentioned than the 14 institutions in the stress test, cf. Chart 26.

If the write-downs are increased to the maximum historical level for the three sectors, a number of institutions will fall below the statutory solvency requirement, cf. Chart 27. If the write-downs are doubled relative to the historical maximum level, some institutions will have difficulty meeting the statutory solvency requirement already in 2010. Several of the institutions cannot meet the requirement in 2011, and more than half of them will come under the statutory requirement in 2012.

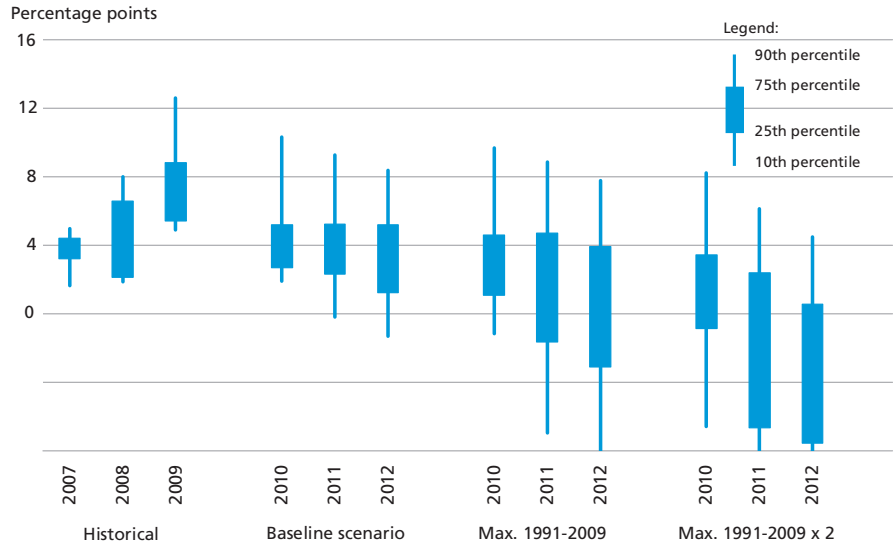
SUMMARY OF THE STRESS TEST

In Danmarks Nationalbank's assessment, the large Danish banking institutions are sufficiently capitalised to meet losses in the expected economic scenario. A few institutions may be facing problems meeting the statutory solvency requirement. In the stress scenarios, where the economic development becomes significantly more negative than expected, more institutions will need to strengthen their capital bases.

A special sensitivity analysis of the sectors agriculture, property administration etc. and building and construction shows that if write-down

EXCESS CAPITAL ADEQUACY IN CASE OF MAJOR WRITE-DOWNS IN SELECTED SECTORS

Chart 27



Source: Danish Financial Supervisory Authority and own calculations.

ratios over three years reach a level corresponding to the levels in the early 1990s, a number of banking institutions will find it difficult to meet the statutory solvency requirements.

The results of the stress test model should be interpreted with caution as the model is a solvency model and therefore does not take liquidity risk into account. The liquidity risk of banking institutions is discussed in the chapter on liquidity

Liquidity

Liquidity has improved over the past year for the banking institutions overall, although there is pronounced dispersion between the institutions. Today the banking institutions and mortgage-credit institutes receive temporary liquidity support by way of the general government guarantee, the option to buy an individual government guarantee and Danmarks Nationalbank's expanded credit facilities. The institutions should prepare for the expiry of the temporary facilities. This includes exploiting the opportunity of buying individual government guarantees if required.

Liquidity problems have been a major factor in the financial crisis. This has led to a number of international initiatives to strengthen the liquidity of the institutions. The exact structure of future liquidity regulation has not been determined yet.

Due to extensive financing of long-term adjustable-rate loans by means of short-term bonds, the mortgage-credit institutes are exposed to liquidity risk.

LIQUIDITY RISK

The banking institutions transform liquid deposits into loans, which are difficult for the institutions to liquidise without incurring losses. This business model has an inherent liquidity risk, i.e. a risk of being unable to honour commitments as they fall due. Banking institutions may use various instruments to reduce this risk. An inappropriate mismatch between the payment profiles for long-term assets and short-term liabilities can be reduced by increasing the maturity of the financing. Banking institutions may diversify their financing and rely on stable sources of deposit. Finally, a sufficient portfolio of liquid assets may serve as a buffer against liquidity stress. Good liquidity management combines all of these elements.

Liquidity problems have been a major factor in the financial crisis. This has led to a number of international initiatives to strengthen the liquidity of the institutions. The Basel Committee and the Committee of European Banking Supervisors, CEBS, have published new guidelines for sound liquidity risk management by credit institutions. Moreover, in December 2009 the Basel Committee published draft international quantitative liquidity standards for credit institutions, and in February 2010 the Euro-

LIQUIDITY MONITORING Box 5

In the light of the experiences during the financial crisis, Danmarks Nationalbank and the Danish Financial Supervisory Authority have joined forces to intensify liquidity monitoring of Danish banking institutions. The monitoring provides the opportunity to monitor liquidity up to 30 September 2010 when the general government guarantee expires.

The liquidity monitoring of Danish banking institutions is based on monthly liquidity reporting by all institutions. The reporting comprises the banking institutions' sources of financing and expected liquidity development as well as stress tests of this development. Moreover, the institutions must provide a detailed account of their liquidity reserves up to the expiry of the Bank Rescue Package. They must account for e.g. how they expect the expiry of the government guarantee to influence deposits and the access to market financing – and how they expect this to affect the price of their financing.

The monitoring induces the banks to maintain focus on liquidity and to be prepared for the phasing out of the general government guarantee, the individual government guarantees and Danmarks Nationalbank's temporary measures to support liquidity. At the same time, the reporting provides the Danish Financial Supervisory Authority and Danmarks Nationalbank with an overview of the liquidity of the individual institutions and the sector as a whole.

Moreover, the reported data will be a useful tool for the Danish authorities in the ongoing process of new international liquidity regulation.

pean Commission published a draft for incorporation of these liquidity requirements into EU law.[1]

The Danish Financial Supervisory Authority and Danmarks Nationalbank have joined forces to intensify liquidity monitoring of Danish banking institutions, cf. Box 5.

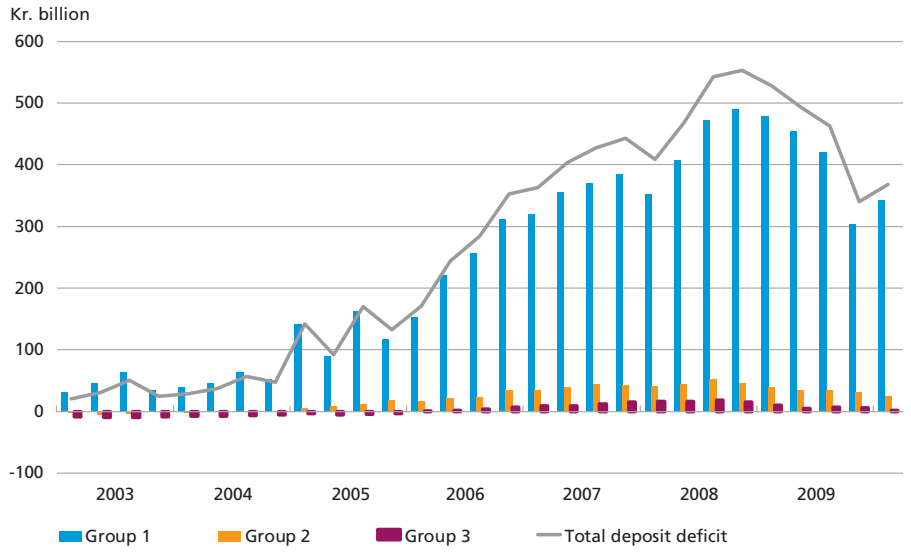
THE BANKING INSTITUTIONS' LIQUIDITY

Since 2008, the banking institutions have reduced their deposit deficit considerably, cf. Chart 28. The deficit occurred over a few years, in which the institutions increasingly financed pronounced growth in lending by means of market-based financing rather than deposits. Market-based financing includes e.g. issuance of bonds and borrowing from other credit institutions. The increased reliance on this type of financing caused problems for the banking institutions when the financial crisis erupted.

The deposit deficit has declined steadily for institutions in all three groups – 1, 2 and 3 – since early 2009, which has reduced the institutions' need for market-based financing and their exposure to related liquidity

[1] For a more detailed description see Borka Babic and Anne-Sofie Reng Rasmussen, Regulatory Initiatives in the Financial Sector, Danmarks Nationalbank, *Monetary Review,* 1st Quarter 2010.
A database of regulatory initiatives in a number of areas monitored by Danmarks Nationalbank can be found at Danmarks Nationalbank's website, www.nationalbanken.dk. This database includes measures relating to liquidity.

DEPOSIT DEFICITS Chart 28

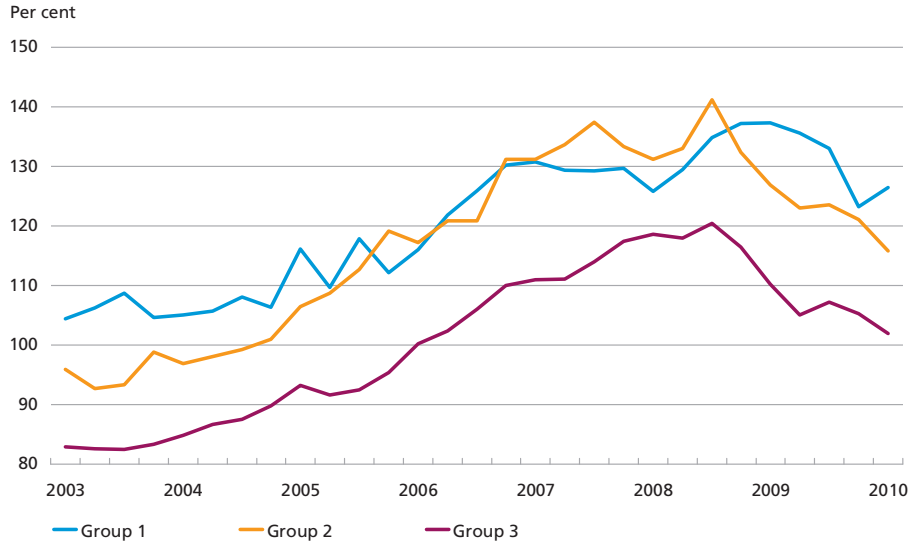


Note: Deposit deficits calculated as lending less deposits. Lending calculated before write-downs.
Source: Danmarks Nationalbank, Statistics on balance and flows of the MFI sector.

risks. In percentage terms, group 3 has the smallest deposit deficit, namely 102 per cent at end-March 2010, cf. Chart 29.

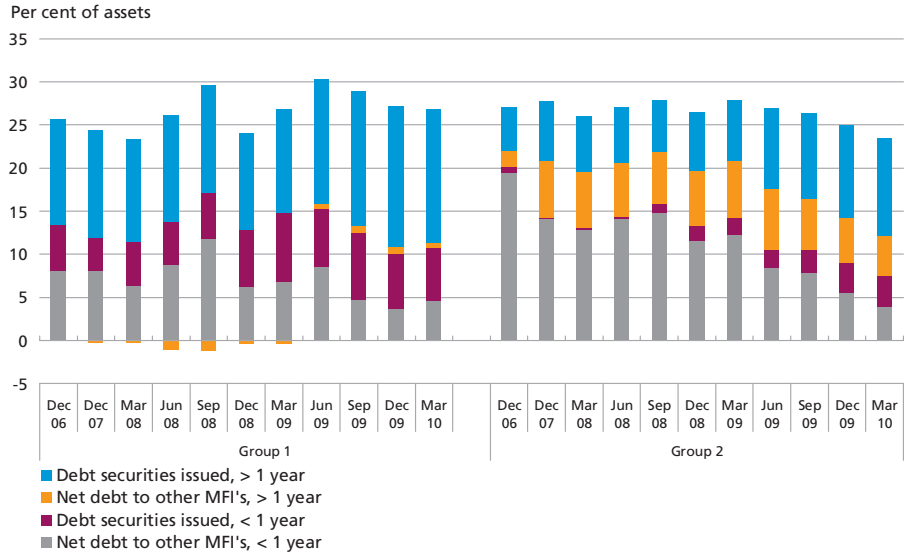
Concurrently, the maturity of the institutions' market-based financing has increased. For institutions in group 1, debt securities issued with a ma-

LENDING AS A PERCENTAGE OF DEPOSITS Chart 29



Note: Lending as a percentage of deposits. Lending calculated before write-downs.
Source: Danmarks Nationalbank, Statistics on balance and flows of the MFI sector .

NET DEBT TO OTHER CREDIT INSTITUTIONS AND DEBT SECURITIES ISSUED Chart 30



Note: Excluding foreign branches and subsidiaries.
Source: Danmarks Nationalbank, Statistics on balance and flows of the MFI sector .

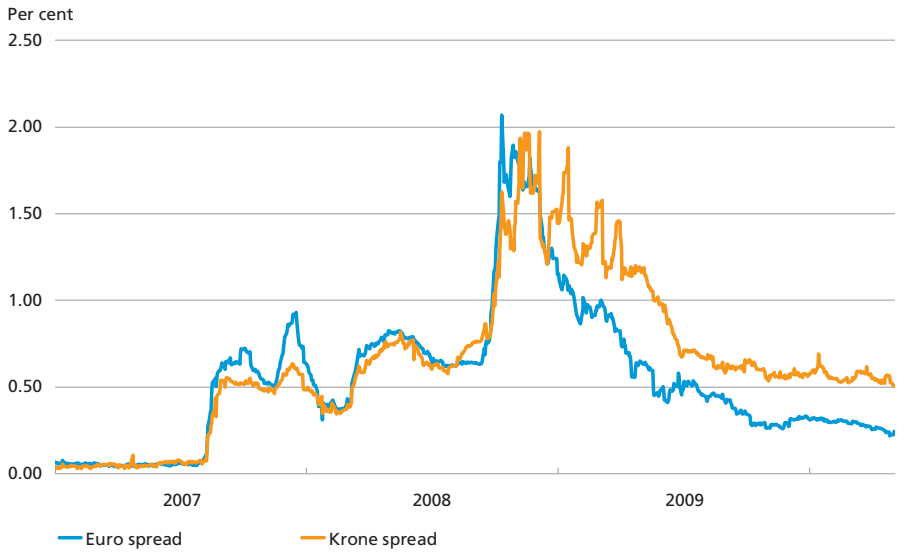
turity of more than 1 year still constitute the largest share of net debt to other credit institutions and debt securities issued. This share has been rising since March 2009, cf. Chart 30. This increases the maturity of the institutions' financing and reduces the mismatch between the maturities of their assets and liabilities. The institutions in group 2 rely more on other credit institutions than those in group 1, but for this group, too, maturities are increasing.

The banking institutions' use of market-based financing to a large extent reflects the accessibility of and financial attractiveness of the various sources of financing. The price of short-term liquidity, illustrated by the spread between collateralised and uncollateralised money-market interest rates, has narrowed substantially since the peak of the financial crisis. Over the last six months it has stabilised at just over 0.5 percentage points, cf. Chart 31. Conditions in the short-term money market have improved, with increased confidence and willingness to provide liquidity in the interbank market. Prices are, however, significantly higher than before the financial crisis, and the liquidity premium in the market thus remains elevated. Moreover, the spread is greater in Denmark than in the euro area even though Danish banking institutions are comprised by the general government guarantee until 30 September 2010.

The institutions can minimise liquidity risks by building up portfolios of liquid assets that are eligible as collateral for loans from Danmarks Nationalbank or can be sold in the market at short notice without large

SPREAD BETWEEN COLLATERALISED AND UNCOLLATERALISED MONEY-MARKET INTEREST RATES, 3-MONTH MATURITY

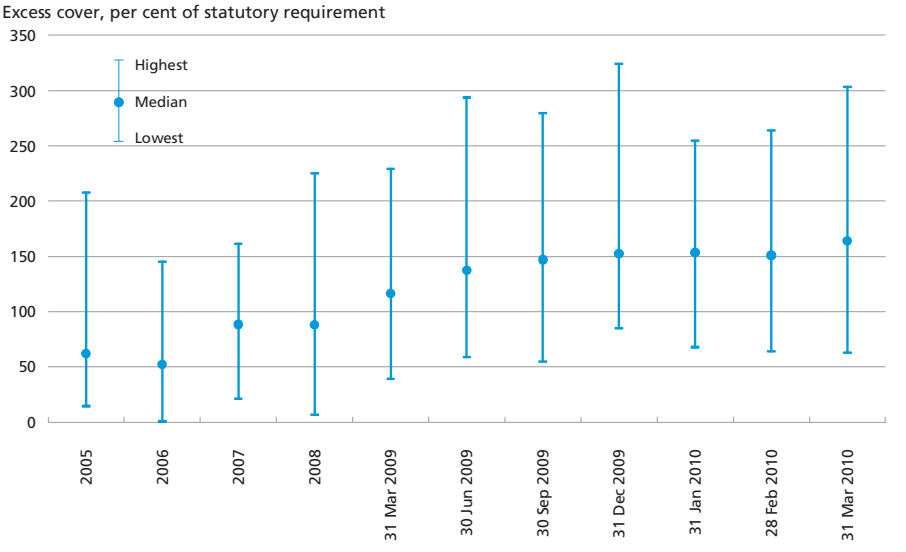
Chart 31



Note: The euro spread is 3-month Euribor less the 3-month Eonia swap spread. The krone spread is 3-month Cibor less the 3-month swap spread.
Source: Bloomberg.

EXCESS LIQUIDITY COVER IN DANISH BANKS

Chart 32



Note: The Chart is 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 Danish 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.
Source: Financial statements and liquidity reporting to the Danish Financial Supervisory Authority and Danmarks Nationalbank.

capital losses. The Danish Financial Supervisory Authority's key ratio for liquidity provides an indication of the excess liquidity cover at a given time. This is an expression of the institutions' holdings of liquid assets relative to the statutory minimum requirement. The institutions' excess liquidity cover generally increased during 2009, cf. Chart 32. However, there is still considerable dispersion between the institutions.

GOVERNMENT GUARANTEES

Under the Bank Rescue Package from October 2008, the Danish government provides an unlimited guarantee to all depositors and other unsecured creditors, exclusive of covered bonds (SDOs), against losses in Danish banking institutions up to and including 30 September 2010.[1] Furthermore, the Credit Package from February 2009 made it possible for Danish credit institutions to enter into agreements to purchase individual government guarantees for non-subordinated unsecured debt, etc. Individual government guarantees run for up to three years. Under the Financial Stability Act, the individual government guarantee covers loans issued before 31 December 2010, subject to current approval by the European Commission. The Financial Stability Company has announced that on the basis of statements from the Commission it is uncertain whether the Commission will approve an extension after 30 June 2010 – and if so on which conditions.[2] Banking institutions wishing to purchase an individual government guarantee should thus apply without delay.

The general government guarantee entails that deposits are fully covered until 30 September 2010. Concurrently with the expiry of the general government guarantee, the deposit guarantee will be increased to cover net deposits of up to 100,000 euro, approximately kr. 750,000, for ordinary deposits, while special deposits, including pension savings, will be fully covered.[3]

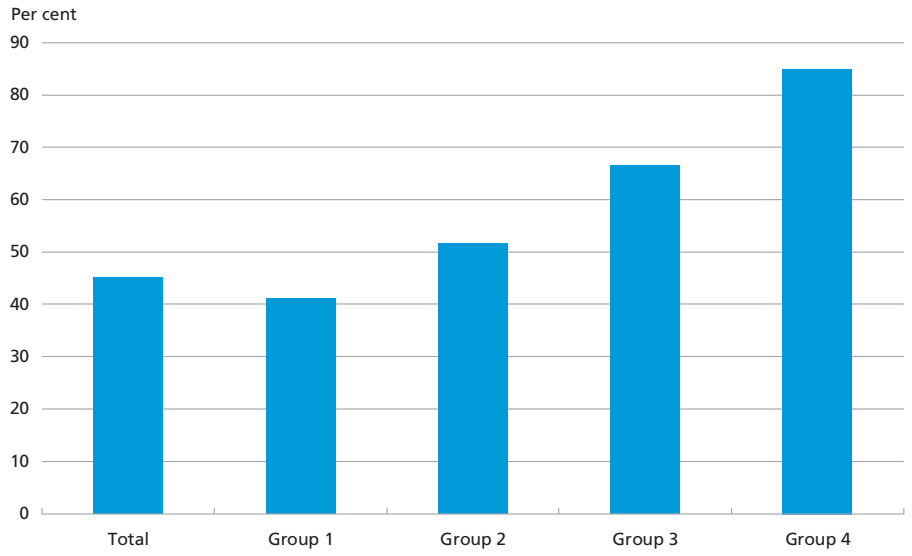
A good 45 per cent of the banking institutions' current deposits will be covered by the deposit guarantee scheme after 30 September 2010, cf. Chart 33. Large deposits are often concentrated in large banking institutions. Typically the deposits not covered by the deposit guarantee scheme will be deposits from local authorities and large companies, but some private individuals also have deposits exceeding the limit. When the govern-

1 For further details, see Box 1 in Danmarks Nationalbank, *Financial stability*, 2nd half 2008.

2 Cf. the Financial Stability Company's press release of 15 February 2010; the European Commission has approved an extension of the individual government guarantee scheme until 30 June 2010, which means that loans can be issued and disbursed until 30 days after 30 June 2010, provided that the guarantee has been issued by the Financial Stability Company on this date at the latest.

3 Until 30 September 2010, the deposit guarantee covers an amount equivalent to 50,000 euro, approximately kr. 375,000, in banking institutions that are not members of the Danish Contingency Association.

DEPOSITS COVERED BY THE DEPOSIT GUARANTEE SCHEME AFTER 30 SEPTEMBER 2010 Chart 33



Note: Based on figures at end-March 2010.
Source: Liquidity reporting to the Danish Financial Supervisory Authority and Danmarks Nationalbank.

ment guarantee expires, depositors of large amounts will have to consider the credit standing of the individual institution. This means that institutions with low credit standings that are highly dependent on large deposits may find it difficult to procure liquidity.

If depositors trust the institution where they place their funds, the transition from a general government guarantee to the deposit guarantee scheme may be smooth. The deposit guarantee is not the only factor to influence the stability of deposits. Depositors who not only have deposits, but also transact large volumes of business with the institution in question, will typically be less inclined to move deposits than depositors with lower business volumes.

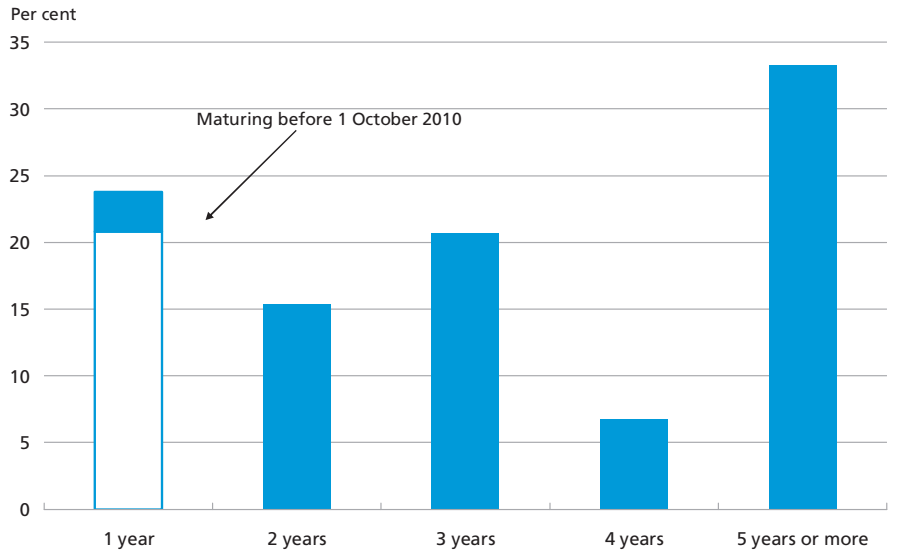
During the financial crisis, the banking institutions' access to market-based financing was to a large extent influenced by the general government guarantee.

Around 20 per cent of the banking institutions' debt issued with an original maturity of more than 1 year will fall due before the expiry of the general government guarantee, cf. Chart 34. Of the debt issued with a maturity of less than 1 year the largest share by far will fall due before the expiry of the government guarantee. Issuances with a remaining term to maturity of 1-2 years or 3-4 years make up relatively small shares.

The institutions hold considerable medium-term and long-term financing that extends beyond the expiry of the general government guaran-

MATURITY PROFILE FOR DANISH BANKS' ISSUES WITH AN ORIGINAL MATURITY OF MORE THAN 1 YEAR

Chart 34



Note: Based on figures at end-March 2010 for Danish banks in groups 1 and 2.
Source: Liquidity reporting to the Danish Financial Supervisory Authority and Danmarks Nationalbank.

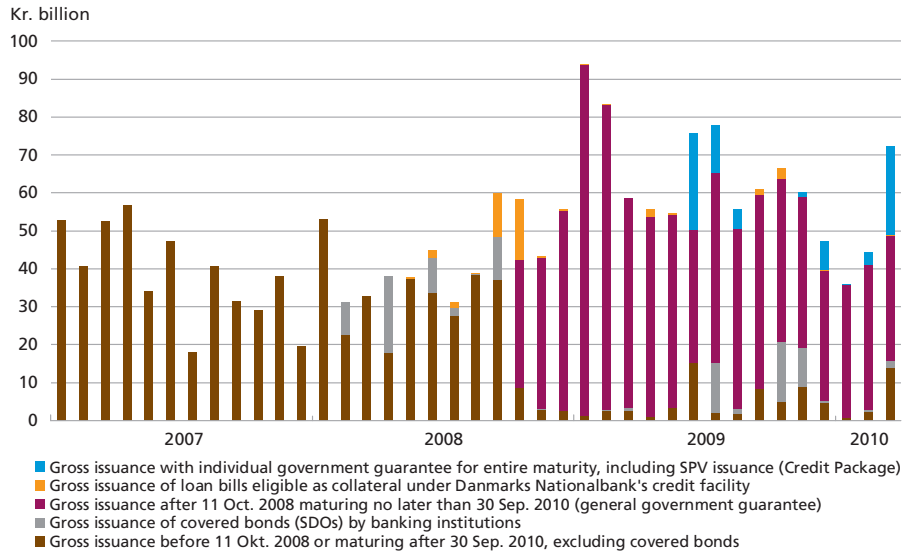
tee. This is partly attributable to the option to purchase individual government guarantees with a maturity of up to 3 years. As at 3 May 2010, 27 institutions had been approved for individual government guarantees totalling kr. 254 billion. So far, 20 institutions have issued for a total of kr. 93 billion with individual government guarantees.[1] In addition, several institutions have issued debt on normal market conditions.

For many institutions, it is financially advantageous to raise government-guaranteed financing with an individual government guarantee. For institutions without ratings, the annual price of a government guarantee is 0.95 per cent of the principal. If the interest-rate spread between unguaranteed and guaranteed issuance exceeds this percentage, it is most advantageous to issue under an individual government guarantee. Since the summer of 2009 there has been a tendency for large, well-capitalised institutions to opt for longer-term financing without purchasing individual government guarantees.

Most of the banking institutions' gross issues of securities expire on 30 September 2010 or earlier, and thus they are covered by the general government guarantee, cf. Chart 35. Since mid-2009, the institutions have, however, begun to issue with longer maturities, both with and without individual government guarantees. For example, Danske Bank and BNP

[1] Including one mortgage-credit institute which has issued for kr. 7.3 billion.

GROSS SECURITIES ISSUANCE BY DANISH BANKS Chart 35



Source: Danmarks Nationalbank.

Paribas have established an SPV, Valhalla, which has issued bonds in euro on the basis of government-guaranteed issues from seven smaller Danish banking institutions for 750 million euro. Other institutions are considering similar initiatives.

DANMARKS NATIONALBANK'S MEASURES TO SUPPORT LIQUIDITY

Some banking institutions – especially in group 3 – have been supported by temporary liquidity measures launched by Danmarks Nationalbank, cf. Box 6. These initiatives include expanding the collateral base, as well as an option to obtain credit on the basis of excess capital adequacy. Parts of these measures were scheduled to expire on 30 September 2010, but have been extended until 26 February 2011.

The excess liquidity cover – with and without Danmarks Nationalbank's temporary facilities – of banking institutions in groups 1, 2 and 3 is illustrated in Chart 36. Data is based on liquidity reporting by the institutions to Danmarks Nationalbank and the Danish Financial Supervisory Authority. Under the credit facility against excess capital adequacy, credit lines totalling kr. 12.4 billion had been granted at end-April 2010, but had been drawn on only a few times. Both this facility and Danmarks Nationalbank's expanded collateral base may be included in the institutions' statutory liquidity. Not all institutions have stated in their liquidity reporting whether they include Danmarks Nationalbank's expanded collateral base in their sta-

tutory liquidity. Consequently, the effect of this facility may be underestimated in Chart 36.

Especially the credit facility against excess capital adequacy has contributed to increasing the institutions' excess liquidity cover, cf. Chart 36,

DANMARKS NATIONALBANK'S MEASURES TO SUPPORT LIQUIDITY Box 6

During the financial crisis, Danmarks Nationalbank has temporarily expanded its credit facilities for banking institutions and mortgage-credit institutes. The measures to support liquidity comprise three schemes:

Firstly, the collateral base for loans from Danmarks Nationalbank to the institutions has been expanded to include quoted and unquoted shares, investment fund shares, special loan bills, bank bonds with government guarantee, as well as SPV bonds issued on the basis of government-guaranteed loans to the institutions.

Both loan bills and SPV bonds must meet Danmarks Nationalbank's standard terms. Loan bills are zero-coupon securities issued by banking institutions in the Kingdom of Denmark. The maximum maturity is 1 year. They must be issued with VP Securities as the account controller.

SPV bonds must be issued by a company that does not engage in any other business than granting these loans and issuing the bonds. The company's income from the loans must at least be equivalent to the commitments imposed by the bonds. The bonds must be approved by Danmarks Nationalbank.

Originally, the temporary expansion of the collateral base comprised all junior covered bonds. However, effective from 1 February 2010, junior covered bonds were included in Danmarks Nationalbank's general collateral base, subject to a rating requirement.

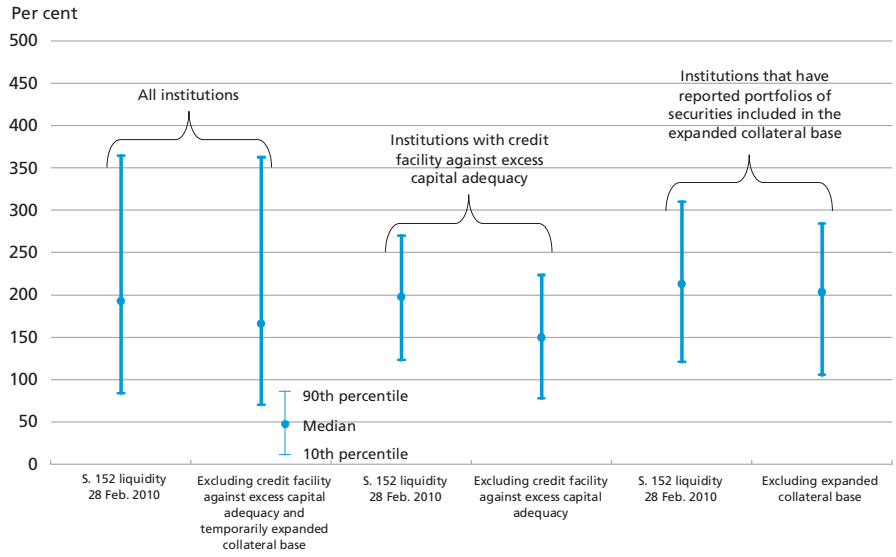
Bank and SPV bonds are eligible as collateral until 30 December 2013. The other types of securities were previously eligible until 30 September 2010. In April 2010, the option of pledging shares, investment fund shares and loan bills as collateral was extended to 26 February 2011.

Secondly, Danmarks Nationalbank has introduced a credit facility for the institutions on the basis of excess capital adequacy. Credit granting is subject to individual assessment. If an institution chooses to exercise the credit commitment, it must pay a rate of interest corresponding to Danmarks Nationalbank's lending rate plus a premium.

Initially, the credit facility against excess capital adequacy expired on 30 September 2010, but it has also been extended to 26 February 2011. The current interest premium is 1 percentage point, to be raised to 2 percentage points as from 1 October 2010 on the expiry of the general government guarantee under the Bank Rescue Package.

Thirdly, during the crisis, Danmarks Nationalbank entered into swap agreements with the Federal Reserve and the European Central Bank, ECB, with the aim to improve liquidity in the market for short-term euro and dollar liquidity. Danmarks Nationalbank has not conducted currency auctions under its swap lines since 15 September 2009, and the banking institutions and mortgage-credit institutes have not had any currency-denominated loans at Danmarks Nationalbank since 25 November 2009. As the foreign-exchange markets continue to normalise, the institutions have been able to meet their needs to borrow foreign exchange without the assistance of Danmarks Nationalbank. Danmarks Nationalbank's swap agreement with the Federal Reserve was not extended when it expired on 1 February 2010. The same applies to the Federal Reserve's swap lines with a number of other central banks.

STATUTORY EXCESS LIQUIDITY COVER FOR DANISH BANKS IN GROUPS 1, 2 AND 3, WITH AND WITHOUT DANMARKS NATIONALBANK'S TEMPORARY LIQUIDITY FACILITIES Chart 36



Note: Data based on figures as at end-February 2010 for Danish banks in groups 1, 2 and 3. The data set covers 95 of the institutions. 34 of these have credit facility against excess capital adequacy. For 54 of the 95 institutions, we have information on Danmarks Nationalbank's expanded collateral base. 35 of the 54 institutions have reported portfolios of securities included in Danmarks Nationalbank's expanded collateral base (excluding loan bills and SPV bonds).

Source: Liquidity reporting to the Danish Financial Supervisory Authority and Danmarks Nationalbank.

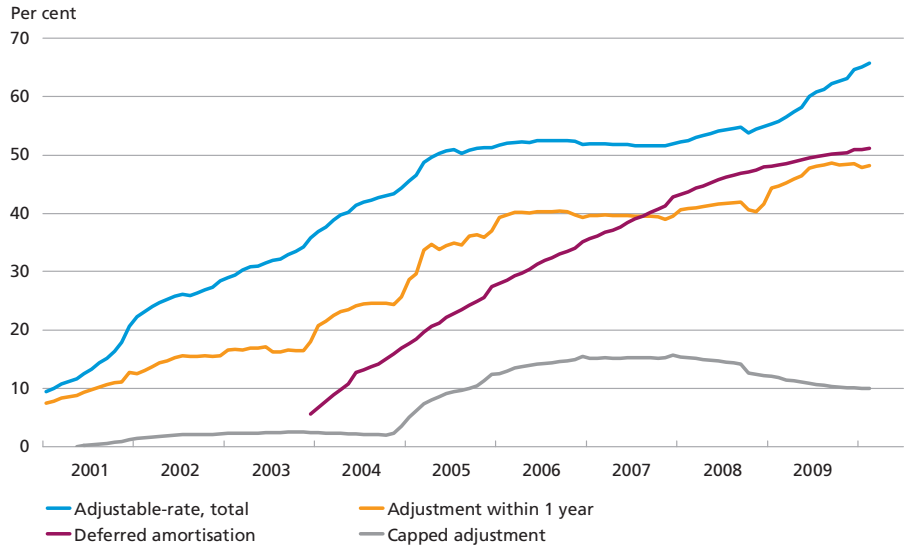
but even without this facility the excess relative to the statutory requirement would have been considerable. It is seen that the institutions that have made use of Danmarks Nationalbank's temporary measures to support liquidity have generally had lower excess liquidity cover than the sector overall. This applies both when the excess liquidity cover is calculated with and without these facilities.

Overall, the banking institutions have improved their liquidity over the past year. It is paramount that the institutions continue to focus on their liquidity needs, applying financing strategies that provide the necessary security.

THE MORTGAGE-CREDIT INSTITUTES' LIQUIDITY RISK

The mortgage-credit institutes are exposed to liquidity risk. In contrast to the risks incurred by the banking institutions, this is, however, a relatively new risk, which was introduced when the mortgage-credit institutes began to finance long-term adjustable-rate mortgage loans with short-term bonds.

ADJUSTABLE-RATE LOANS AND DEFERRED-AMORTISATION LOANS AS RATIOS OF TOTAL LENDING BY MORTGAGE-CREDIT INSTITUTES Chart 37



Note: Monthly figures. Loans for all sectors excluding the MFI sector. The series for deferred-amortisation loans is the result of linear interpolation from quarterly data up to and including 2004. The series for capped adjustment is composed of lending data from the MFI statistics as from March 2008 and the volume of outstanding bonds issued to finance capped-rate loans before March 2008.
Source: Danmarks Nationalbank.

Irrespective of future regulation, the extensive use of short-term bonds to finance long-term loans makes it relevant for mortgage-credit institutes to consider solutions to reduce the liquidity risk in this connection.

Adjustable-rate loans and liquidity risk

The structure of the mortgage-credit institutes' lending has changed rapidly over the last decade. While in the past loans were predominantly fixed-rate loans with amortisation, approximately 65 per cent of the outstanding volume is now made up of adjustable-rate loans, and only around half of the outstanding volume is with amortisation, cf. Chart 37.

The rising share of adjustable-rate loans is mainly financed via short-term bonds with regular refinancing. Moreover, refinancing is to a large extent concentrated on the last few months of the year.

Following discussions between Danmarks Nationalbank, the Association of Danish Mortgage Banks and the Danish Mortgage Banks' Federation it was agreed that members of the latter two should implement measures to ensure a more suitable and even distribution of these refinancing activities over the year than has been the case until now.[1] This will reduce

[1] Cf. the press releases of the Danish Mortgage Banks' Federation and the Association of Danish Mortgage Banks of 12 October 2009 on spreading out the December refinancing activities.

the concentration risk and thus also eliminate some of the operational risk arising when very large payments need to be settled within a short space of time.

Even if the refinancing auctions are spread out, it nevertheless remains a fact that investors buying short-term bonds, which must regularly be refinanced at a variable rate of interest, make liquidity available for relatively short periods only, often just one year. This is in stark contrast to the traditional fixed-rate loans, where bond investors make liquidity available throughout the maturity of the loan.

The adjustable-rate structure, with regular refinancing of short-term bonds, entails automatically passing on the refinancing interest to the borrower. Consequently, the borrower must initially pay up if investors at some point during the maturity of the loan require a higher rate of interest in return for providing liquidity. However, there is a limit to the interest that borrowers are able to pay. All other things being equal, large interest-rate rises will increase the credit risk of the mortgage-credit institutes. As a result, investors may demand even higher interest for still providing liquidity. This could lead to a situation where no rate of interest can be found at which the institutes can obtain the necessary liquidity. Moreover, the financial crisis has shown that situations may arise where it is not possible to issue in certain markets.

This risk does not exist in relation to fixed-rate loans, which are financed by means of long-term bonds. Nor does it exist for variable-rate loans financed by variable-rate long-term bonds. In these cases investors from the outset make liquidity available throughout the maturity of the loan. Experience from the financial crisis, as well as the proposals for future liquidity regulation make it relevant for the institutions to consider structures entailing more limited liquidity risk.

Danmarks Nationalbank's Oversight of the Financial Infrastructure in Denmark

The Danish payment and settlement systems have been more or less unaffected by the financial crisis. In Danmarks Nationalbank's payment system, Kronos, the participants have reserved ample liquidity relative to their daily payments. Similarly, no significant problems have been observed in the settlement of retail payments and securities transactions in the Sumclearing and VP settlement, respectively. As regards the VP settlement, this was most recently emphasised by the smooth settlement on the first banking day of 2010 despite record-high refinancing of adjustable-rate loans. The most serious problems for the Danish payment and settlement systems in 2009 were related to a system breakdown at their joint provider of IT operational services.

KRONOS

Danmarks Nationalbank's payment system, Kronos, handles a major part of the exchange of krone payments in the Danish financial system. The main transaction categories are interbank payments, i.e. payments between two account holders, monetary-policy operations, i.e. transactions between Danmarks Nationalbank and account holders, and transfers to other payment and settlement systems.

2009 saw a decrease by just over 10 per cent in the value of payments in Kronos, cf. Table 8. This is attributable partly to a lower value of interbank payments due to e.g. reduced market activity as a result of the financial crisis, partly to a decline in the volume of monetary-policy operations as a consequence of the banking institutions' and mortgage-credit institutes' reduced gross positions vis-à-vis Danmarks Nationalbank by way of loans and certificates of deposit.

Kronos is a real-time gross settlement system, RTGS system, in which payments are settled individually in real time. This reduces credit risk in the system, but entails a larger liquidity requirement than would have been the case for net settlement. In order to accommodate this need, Danmarks Nationalbank grants intraday credit against Danish government securities, mortgage-credit bonds, covered bonds, etc. and – temporarily – a number of other securities as collateral.[1]

[1] See Box 6 for a description of Danmarks Nationalbank's measures during the financial crisis, including the temporary expansion of the collateral basis for loans from Danmarks Nationalbank.

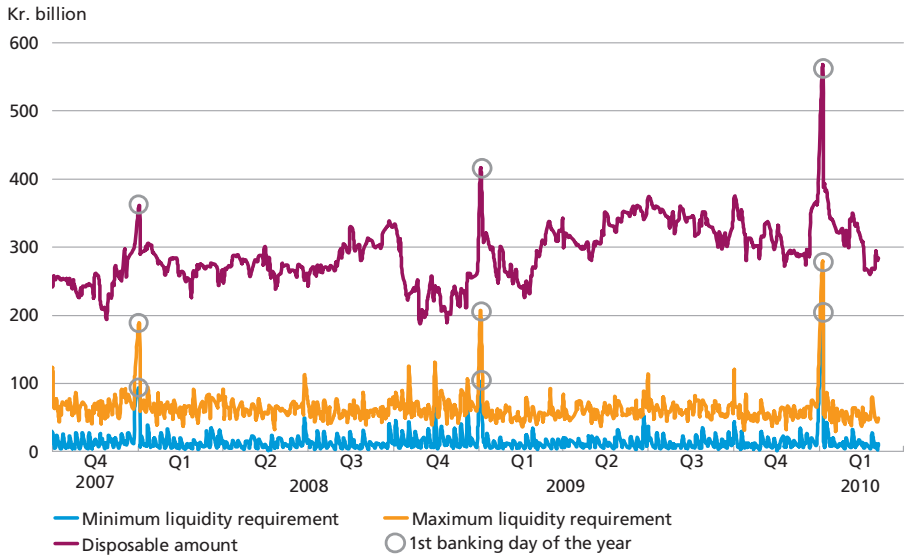
PAYMENTS IN KRONOS, DAILY AVERAGE — Table 8

Kr. billion	2005	2006	2007	2008	2009
Interbank payments	125.7	132.2	124.0	119.8	105.5
Monetary-policy operations	31.0	32.3	54.9	88.7	70.3
Transfers to payment systems	73.5	87.8	93.0	97.2	99.1
Other transactions	2.9	1.8	2.1	2.0	1.2
Total	233.1	254.0	274.1	307.7	277.0

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.

The participants' disposable amounts for payment settlement in Kronos significantly exceeded their liquidity requirements again in 2009, cf. Chart 38. Overall, there is thus still ample liquidity for the participants' daily payments, but this should not induce the participants to relax their intraday liquidity management as intraday liquidity is paramount to smooth settlement in Kronos.

LIQUIDITY REQUIREMENT OF KRONOS PARTICIPANTS — Chart 38



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.

RETAIL PAYMENTS

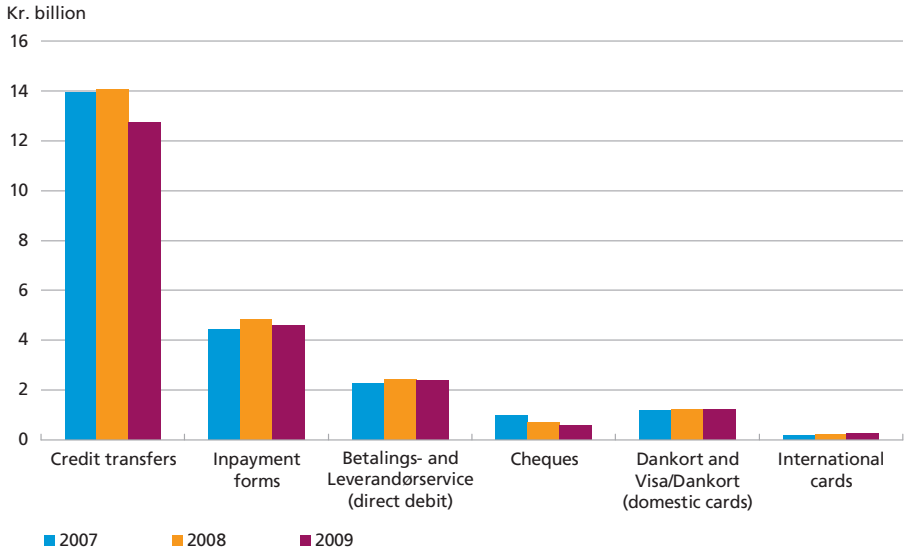
The retail payments of Danish private individuals and companies are settled in the Sumclearing. 2009 saw a decrease in the value of most types of retail payments in the Sumclearing, cf. Chart 39. The only exception was the slight increase in the value of payments related to international payment cards, which still account for only a small part of total Danish card payments, however. The value of Dankort and Visa/Dankort payments was almost unchanged.

Sumclearing operations

The Sumclearing is a net settlement system owned by the Danish Bankers Association. The Sumclearing collects payments over 24 hours for settlement in a night-time block. The banking institutions must reserve liquidity for this purpose in advance, and they are removed from the settlement (postponed) in the event of insufficient cover. The next morning, postponed institutions may transfer more liquidity for the settlement.

The improvement of Sumclearing operations, which was described in Financial stability 2009, 1st half, continued in 2009. Timely completion of settlement failed on only six days. In both 2007 and 2008, the number was 21 days. The improvement is a result of the increase in the Danish Bankers Association's postponement fee as from 1 January 2009.

SUMS SETTLED IN THE SUMCLEARING, DAILY AVERAGES — Chart 39



Source: Danish Bankers Association.

Substantial excess cover in the Sumclearing

According to international standards, systemically important net settlement systems should be able to withstand the removal from settlement of the participant with the largest payment obligation. Consequently, Danmarks Nationalbank has analysed whether this applies to the Sumclearing. The analysis is based on all banking days in 2009, cf. Box 7. It appears that even if the participant with the largest payment obligation is removed from the settlement, this will have no impact on the other participants on any days. The same applies if the participant with the second-largest payment obligation is removed.

Moreover, the analysis confirms the importance of reserving sufficient liquidity for the settlement. This appears from a hypothetical reduction of the excess cover by a given percentage for all participants and the removal from the settlement of the participant with the largest and possibly also the participant with the second-largest payment obligation. Depending on the size of the reduction, this will lead to postponement of participants.

Postponed participants impede the settlement, even though their payments are normally completed the next morning. Firstly, they delay part of the other banking institutions' entries to customer accounts, which take place after completion of settlement. Secondly, they prolong risk in the system. Postponements are thus particularly problematic on large settlement days.

In a previous similar analysis, Danmarks Nationalbank concluded that the Sumclearing is robust against events resulting in the removal of the participant with the largest payment obligation from the settlement.[1] Consequently, the participants have made no major adjustments to their excess liquidity cover as a result of the financial crisis.

SEPA

On 2 November 2009, banks in Europe introduced a new instrument for payments in euro, called SEPA Direct Debit. It is expected to take quite a long time before this product, which is similar to the Danish Betalingsservice system, replaces the existing domestic products. This also applies to the other SEPA instrument, SEPA Credit Transfer, which accounted for only 6.7 per cent of all credit transfers in the euro area in February 2010.[2]

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1 See Danmarks Nationalbank, *Financial stability*, 2002.
2 Source: European Central Bank, ECB.

ASSESSMENT OF SYSTEMIC RISKS IN THE SUMCLEARING Box 7

Danmarks Nationalbank defines the Sumclearing as a systemically important payment system. Such systems must comply with the Core Principles for Systemically Important Payment Systems, CPSIPS, laid down by BIS. According to CPSIPS standard V, systems in which multilateral netting takes place should be capable of ensuring the timely completion of the settlement even in the event of an inability to settle by the participant with the largest settlement obligation.

An analysis of the Sumclearing's compliance with this standard requires information on the bilateral positions of the participants. This is necessary in order to recalculate the net positions of the other participants when one participant is removed. For some of the other participants, the new positions may, at worst, exceed their reserved amounts, leading to postponement of them as well, i.e. a domino effect.

The analysis is based on data on the bilateral positions of the Sumclearing participants for all banking days in 2009. For each of the 248 banking days, the change in the net positions in the event of removal of the participant with the largest and the participant with the second-largest payment obligation is calculated. The new net positions are compared with the reserved amounts of the remaining participants.

The results show that settlement in the Sumclearing is robust against this type of event. The removal of the participant with the largest payment obligation would not have had any impact on the other participants on any day in 2009, cf. the Table. The same applies in the event of removal of the participant with the second-largest payment obligation.

The robustness can be attributed to the participants' daily allocation of ample liquidity for night-time settlement. The significance of this is illustrated by hypothetically reducing the excess cover by a given percentage and repeating the experiment. Depending on the size of the reduction, this results in postponement of participants. For example, halving the excess cover of the participants will lead to postponements on four days in the period, cf. the Table.

POSTPONEMENTS ON REMOVAL OF PARTICIPANT(S), 2009

Excess cover	Removal of largest participant	Removal of largest and second-largest participants
Actual excess cover	0 days/0 participants	0 days/0 participants
75 per cent of excess cover	0 days/0 participants	2 days/2 participants
50 per cent of excess cover	4 days/4 participants	6 days/6 participants
25 per cent of excess cover	7 days/10 participants	21 days/26 participants

Note: The Table shows the number of days in the period with postponement and the number of participants postponed. For example, if the excess cover is reduced to 25 per cent of the actual excess cover and the participant with the largest payment obligations is removed, a total of 10 participants are postponed on seven different days.
Source: Danish Bankers Association and own calculation.

With a view to bringing the transition to SEPA products forward, it is being considered to set a formal deadline for the migration of domestic payments to SEPA. Subject to a mandate from the Ecofin Council, the European Commission is currently analysing implementation methods.

Danmarks Nationalbank supports the SEPA Direct Debit solution for the Danish banking institutions by participating in a trans-European payment system for the product, STEP2, on behalf of the institutions.[1] All banking institutions in Denmark can join this scheme.

Working group on domestic payment transfers

In the spring of 2009, Danmarks Nationalbank, at the request of the Minister for Economic and Business Affairs, established a working group to analyse the need for shorter settlement times in Denmark and how this may be achieved. The members of the working group represented a wide range of stakeholders. The working group published its recommendations in a report in January 2010.[2] The specific recommendation of the working group is that the Danish Bankers Association, PBS and Danmarks Nationalbank should prepare a final basis for decision on whether to introduce shorter settlement times in Denmark for all retail payments completed during the weekend and whether to enable intraday credit transfer. The basis for decision is expected to be ready in the 2nd half of 2010.

Cost analysis

In 2010, Danmarks Nationalbank will be conducting an analysis of the costs of various types of retail payments in Denmark. The analysis should, to the highest possible degree, measure the costs for all payment parties involved, i.e. not just the banking institutions.

This analysis will be part of an ongoing larger trans-European analysis initiated by the European Central Bank with the purpose of comparing retail payment costs across Europe. The Danish and the European reports are both expected to be published in 2011.

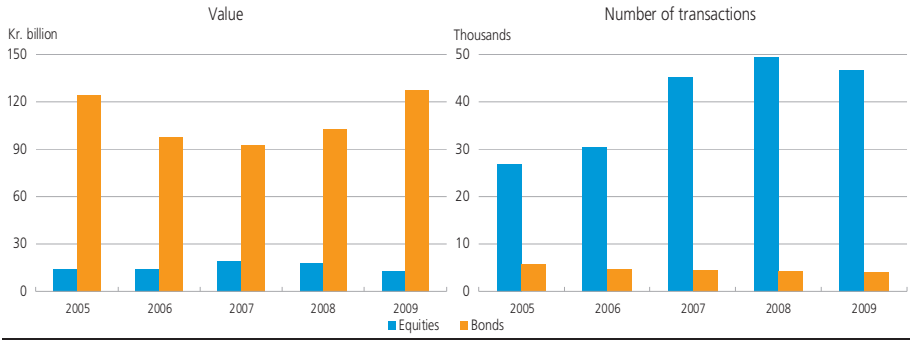
SECURITIES SETTLEMENT

The level of trading settlement in VP Securities remained high in 2009, cf. Chart 40. The value of settled bond transactions, accounting for the major part of turnover, was approximately 24 per cent up on 2008, cf. Chart 40. The number of settled equity transactions was almost unchanged in 2009, while their value fell by 28 per cent, primarily due to lower equity prices. The introduction of CCP clearing has reduced the number of equity transactions for VP settlement, cf. below.

[1] See Anders Mølgaard Pedersen, SEPA Direct Debit – a New European Payment Instrument, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2009.

[2] See Danmarks Nationalbank, Report on domestic payment transfers in Denmark *(in Danish with an English translation of the summary and recommendations)*, January 2010.

EQUITIES AND BONDS SETTLED IN THE VP SETTLEMENT, DAILY AVERAGE Chart 40



Source: VP Securities.

VP settlement operations

Like the Sumclearing, the Danish settlement system for securities transactions, etc., called VP settlement, is a multilateral net settlement system. Trading settlement takes place primarily in a number of night-time settlement blocks. Moreover, the system handles settlement of a certain amount of securities transactions, interest and dividend payments as well as exchange of kroner against euro from the night-time settlement in a number of day-time blocks.

In 2009, the night-time settlement blocks generally ran according to schedule, whereas the tendency towards more frequent postponement of the day-time blocks continued, cf. Table 9. This applies especially to the VP33 settlement block for kroner against euro, in which buyers of euro-denominated securities settled as krone transactions in the night-time blocks deliver euro against kroner.

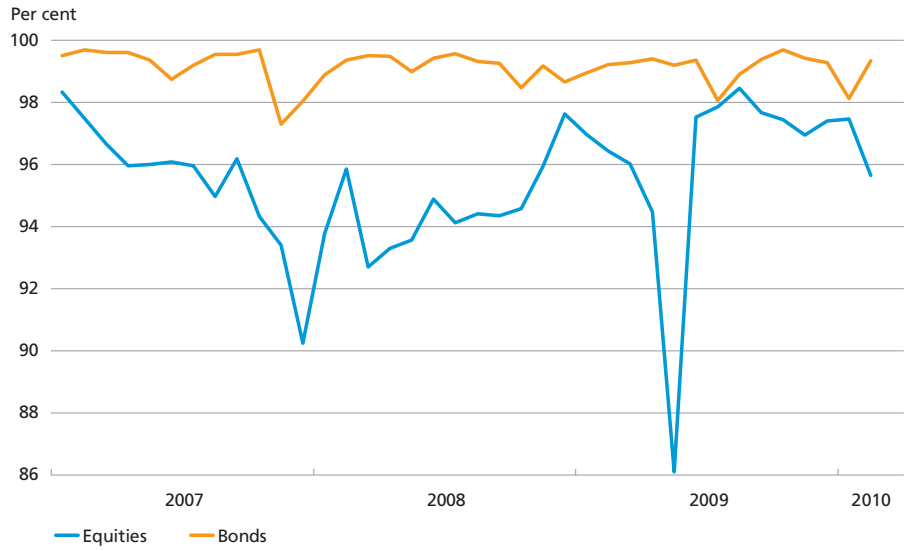
A main reason for the delays in VP33 is the relatively early settlement time for this block, i.e. 9:20 a.m., shortly after the opening of the euro area money market. This gives the Danish banking institutions little time to raise euro liquidity. Danmarks Nationalbank has encouraged the

DELAYS IN DAY-TIME SETTLEMENT IN DANISH KRONER Table 9

Days when settlement was delayed by more than 30 minutes	2005	2006	2007	2008	2009	Q1 2010
VP33 (PvP)	2	0	2	6	5	1
VP35 (periodic payments)	2	3	1	3	4	0
VP40 (trading settlement)	0	0	0	0	2	0
VP60 (trading settlement)	0	1	1	0	0	0
Total delays in day-time krone blocks	4	4	4	9	11	1

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

SETTLEMENT RATES FOR SECURITIES TRANSACTIONS IN THE VP SETTLEMENT Chart 41



Source: VP Securities.

market participants to analyse the consequences of moving the settlement time for VP33 to later in the day.

The generally high operational stability in the night-time settlement blocks is also apparent from the share of bond transactions settled on time, which exceeded 98 per cent again in 2009, cf. Chart 41. The settlement rate is usually somewhat lower for equities, but it has improved gradually since 2008. One exception was the sharp drop in the settlement rate for equity transactions in May 2009 due to problems for a single major participant. The introduction of CCP clearing, cf. below, has influenced the compilation of the number of transactions settled on time.

On the first banking day of the year, i.e. 4 January 2010, securities transactions were settled smoothly despite the record-high refinancing of adjustable-rate loans around the turn of the year for settlement primarily on this date. As was the case in 2009, Danmarks Nationalbank and the banking institutions and mortgage-credit institutes had established contingency measures to resolve any settlement problems.

CCP clearing

Since October 2009, there have been calls for clearing via a central counterparty, CCP, for transactions involving equities in major NASDAQ OMX companies. A CCP is the intermediary in a transaction between the buyer and the seller, assuming the counterparty risk on both parties.

Today, CCP clearing is the standard on most stock exchanges in Europe, and after the introduction in Denmark, the Danish market is on a par with the rest of the EU.

The Dutch company European Multilateral Clearing Facility N.V., EMCF, is the CCP on the Danish stock exchange. EMCF also acts as a CCP on a number of other new multilateral trading facilities, MTFs, established after the implementation of the Markets in Financial Instruments Directive, MiFID. As a result, the participants' trades in Danish equities on these trading platforms can be included in one clearing operation at EMCF with overall netting and settlement in VP Securities. EMCF has taken over clearing/netting of between one third and half of the equity transactions that were previously cleared by VP Securities prior to settlement.

Two other CCP's will be offering clearing of transactions on the NASDAQ OMX Nordic markets, including Copenhagen. They are Swiss-based SIX x-clear and UK-based EuroCCP, a subsidiary of the US central securities depository DTCC. Both CCP's are planning to start operations during 2010. This will give the market participants a choice of several CCP's.

Prior to the introduction of CCP clearing, the number of transactions settled on time on the agreed value date, i.e. the settlement rate, was around 96 per cent for equities, which is slightly below the European benchmark. After the transition to CCP clearing, the VP settlement rate has increased to almost 98 per cent, which is on a par with the benchmark. However, the settlement rate for transactions cleared at EMCF is only 93-94 per cent. An investigation has therefore been initiated to identify the reasons. A specific evaluation of the transition to CCP clearing and its consequences will be undertaken in the latter part of 2010.

In view of the risk reduction as a result of CCP clearing, Danmarks Nationalbank supports NASDAQ OMX's initiative to introduce CCP clearing in the repo market, which is far larger than the equity market. Introduction of CCP clearing will considerably reduce the market risk as repos normally have longer maturities. The CCP clearing option is expected to be in place by the end of 2010.

Target2-Securities

Central banks, including Danmarks Nationalbank, central securities depositories and market participants in Europe have worked together to further define TARGET2-Securities, T2S. T2S is a future trans-European securities settlement system in which cross-border transactions can be effected just as efficiently as domestic transactions. The establishment of

T2S will influence the future securities settlement system in Denmark in several ways.[1] T2S is expected to be operational in September 2014.

Directives

As an element of the European Commission's Giovannini process to remove barriers to efficient clearing and settlement of cross-border securities transactions in the EU, the Commission is expected to present a proposal for a Directive on registration of securities rights in July 2010. This Securities Law Directive addresses the legal barriers to cross-border settlement of securities that are a consequence of the lack of trans-European regulation of securities rights. In Denmark, such provisions are laid down in the Securities Trading Act.[2]

After international negotiations under the auspices of G-20, among others, the Commission has initiated work to implement a number of measures to limit counterparty risk and strengthen the transparency of the derivatives market. The element with the strongest consequences is the wish to prepare a Regulation on securities clearing, including CCP clearing, called European Market Infrastructure Legislation, EMIL. As is the case with the financial Directives, the Regulation is expected to introduce requirements concerning licensing, supervision and risk mitigation. This includes mandatory CCP clearing of standardised derivatives, which mitigates risk.[3]

CLS

The financial crisis has entailed increased focus on counterparty risk, which continued to affect the international multi-currency settlement system CLS in 2009. The number of participants and the number of transactions rose, while the average value of transactions settled fell as more small-scale foreign-exchange dealers joined CLS.

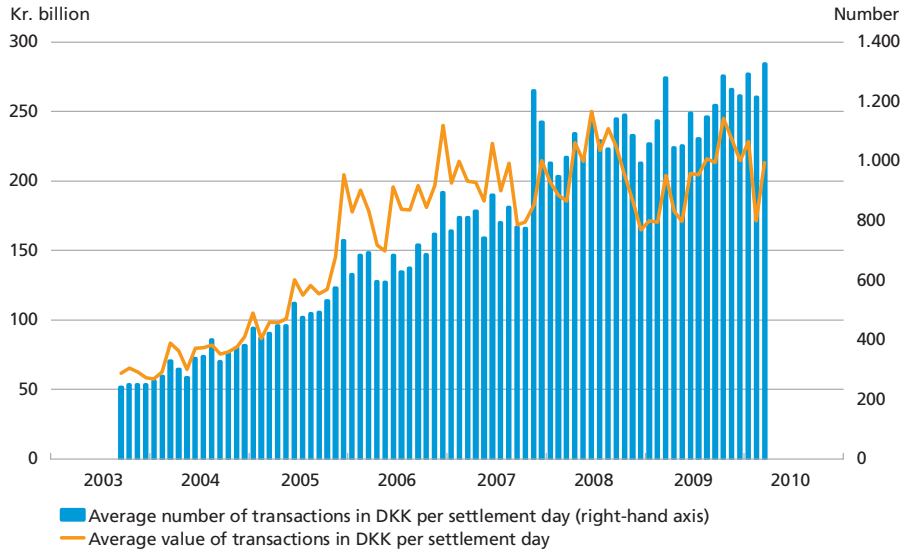
Since its establishment in 2002, CLS has contributed to reducing settlement risk in the foreign-exchange market. In practice, CLS eliminates the credit risk on a foreign-exchange transaction via simultaneous settlement of the two legs, i.e. Payment versus Payment, PvP. For the CLS participants, settlement is still subject to liquidity risk, but this risk is reduced considerably by netting payments in CLS before completion in the national RTGS systems. Consequently, the CLS participants need far less liquidity

1 The status, etc. of Denmark's connection to T2S is described in Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2010.

2 For more details, see Danmarks Nationalbank's database of regulatory initiatives at Danmarks Nationalbank's website, www.nationalbanken.dk.

3 For more details, see Danmarks Nationalbank's database of regulatory initiatives at Danmarks Nationalbank's website, www.nationalbanken.dk.

NUMBER AND VALUE OF FX TRANSACTIONS IN DANISH KRONER SETTLED IN CLS Chart 42



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

than they would have needed for settlement of the gross value of the foreign-exchange transactions via correspondent banks. As regards CLS settlement in Danish kroner, the participants had to pay in only 3 per cent of the total value to CLS in 2009.[1]

A large number of banks joined CLS as indirect participants during 2009. A significant reason is that, during the financial crisis, foreign-exchange transactions without settlement in CLS were more difficult to perform as the settlement risk was greater outside CLS.

The average daily number of transactions in CLS continued to rise in 2009. In 2009, CLS settled an average of 1.204 foreign-exchange transactions daily with one leg in Danish kroner. This represents an increase by 9 per cent on 2008. The average daily value of the transactions, on the other hand, fell by 3 per cent to just over kr. 200 billion, but has nevertheless almost returned to the level before the onset of the financial crisis in the autumn of 2008, cf. Chart 42.

CLS is continuously working to introduce new products and currencies in the settlement system. In view of the rising number of participants, this will enable the participants to settle an ever-increasing proportion of their foreign-exchange transactions via CLS, to the added benefit of financial stability in Denmark.

[1] CLS is described in more detail in Lone Natorp and Tina Skotte Sørensen, Settlement of Foreign-Exchange Transactions, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2006.

New Aggregation Service in CLS

In the light of the continued focus on reducing foreign-exchange settlement risk, CLS established a new function, Aggregation Service, in January 2010. This service aggregates minor foreign-exchange transactions in the same currencies and between the same two counterparties before settlement. This results in a considerably lower number of trading instructions to be settled, and the operational risk on settling a large number of transactions diminishes.

SYSTEM BREAKDOWN

The IT operational responsibility for a number of key systems in Denmark, including payment and settlement systems, is concentrated on few service providers. Consequently, system failure on their part may have a far-reaching impact. A case in point was the system failure on 14 October 2009 at the IT service provider of VP Securities and PBS, which delayed the VP settlement and the Sumclearing.

Since Danmarks Nationalbank holds the responsibility for the oversight of the two systems, it has received written reports on the event from VP Securities and PBS. VP Securities and PBS have described the causes and effects of the event as well as planned and implemented measures to prevent this from happening again.

The companies behind the Danish payment and settlement infrastructure have outsourced IT operations to one single provider, IBM, and Danmarks Nationalbank is initiating an investigation to assess the related concentration risk.

Appendix of Tables

The Appendix comprises four tables. Table 1 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.

Tables 2-4 provide an overview of the development in the financial statements of the banking institutions in groups 1 and 2 as defined on p. 14. The tables are supplemented with the development in the financial statements of the Danish Financial Supervisory Authority's group 3.

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

Table 1

	Base line scenario	Scenario 1	Scenario 2	Scenario 3
2010				
Real growth, per cent, year-on-year				
GDP	1.3	0.6	0.5	0.2
Private consumption	1.7	0.7	0.7	0.5
Public consumption	1.3	1.3	1.3	1.3
Housing investment	-8.5	-15.7	-16.5	-18.5
Business investment	-7.7	-13.1	-13.3	-13.3
Public-sector investments	18.9	18.9	18.9	18.9
Inventory investments (contribution to GDP growth)	0.7	0.7	0.7	0.7
Exports	-1.5	-1.5	-1.6	-2.9
- of which industrial exports	-0.8	-0.8	-1.0	-3.1
Imports	-2.4	-3.9	-4.0	-4.8
Export market growth	4.3	4.3	3.9	1.2
Nominal growth, per cent, year-on-year				
Private sectors disposable income	3.9	3.4	3.7	2.9
HICP	2.0	2.0	2.0	2.0
Hourly wages (industry)	2.3	2.3	2.3	2.3
House prices	0.6	-3.7	-5.8	-3.2
Average level for the year				
Bond yield, per cent p.a.	3.4	3.4	4.1	3.0
3-month money market interest rate, per cent p.a.	0.9	0.9	0.9	0.8
Unemployment, thousands	152.0	158.9	159.5	163.1
Total employment, thousands	2,734	2,727	2,727	2,723
- of which private sector, thousands	1,731	1,724	1,723	1,719
Labour force, thousands	2,886	2,886	2,886	2,886
Unemployment rate, per cent	5.3	5.5	5.5	5.7
Net borrowing/net lending, private sector, kr. billion	150.1	167.3	171.4	163.9
Government budget balance, kr. billion	-96.9	-103.1	-107.3	-103.9
B.o.p. current account, kr. billion	52.8	63.8	63.7	59.7
Crude oil price, dollar/barrel	80.2	80.2	80.2	80.2

CONTINUED Table 1

	Base line scenario	Scenario 1	Scenario 2	Scenario 3
2011				
Real growth, per cent, year-on-year				
GDP	1.7	0.0	-0.7	-2.6
Private consumption	2.8	0.4	0.0	-2.0
Public consumption	0.8	0.8	0.8	0.8
Housing investment	0.6	-13.6	-22.4	-20.4
Business investment	3.9	-3.8	-7.1	-8.0
Public-sector investments	-10.6	10.6	-10.6	10.6
Inventory investments (contribution to GDP growth)	0.7	0.7	0.7	0.7
Exports	2.9	3.0	2.4	-3.0
- of which industrial exports	4.9	5.2	4.7	-2.4
Imports	5.1	2.7	1.6	-2.3
Export market growth	6.6	6.6	4.7	-4.5
Nominal growth, per cent, year-on-year				
Private sectors disposable income	3.0	2.1	2.2	-0.4
HICP	1.5	1.5	1.5	1.4
Hourly wages (industry)	2.5	2.1	2.1	1.7
House prices	1.8	-7.7	-13.1	-11.4
Average level for the year				
Bond yield, per cent p.a.	4.1	4.1	6.1	3.2
3-month money market interest rate, per cent p.a.	1.6	1.6	1.6	0.8
Unemployment, thousands	167.6	200.1	209.5	244.5
Total employment, thousands	2,709	2,676	2,667	2,632
- of which private sector, thousands	1,704	1,672	1,662	1,627
Labour force, thousands	2,877	2,877	2,877	2,877
Unemployment rate, per cent	5.8	7.0	7.3	8.5
Net borrowing/net lending, private sector, kr. billion	125.1	179.2	200.2	180.2
Government budget balance, kr. billion	-85.4	-108.7	-127.1	-125.9
B.o.p. current account, kr. billion	39.3	70.1	72.7	53.9
Crude oil price, dollar/barrel	84.7	84.7	84.7	84.7

CONTINUED Table 1

	Base line scenario	Scenario 1	Scenario 2	Scenario 3
2012				
Real growth, per cent, year-on-year				
GDP	1.9	1.5	0.5	-1.5
Private consumption	3.3	2.5	1.6	-1.2
Public consumption	0.8	0.8	0.8	0.8
Housing investment	1.8	0.4	-9.8	-9.2
Business investment	3.8	3.3	-0.5	-5.7
Public-sector investments	-7.8	-7.8	-7.8	-7.8
Inventory investments (contribution to GDP growth)	0.1	0.1	0.1	0.1
Exports	3.0	3.1	2.2	-1.2
- of which industrial exports	5.0	5.2	4.6	1.9
Imports	4.0	4.0	2.5	-1.2
Export market growth	6.0	6.0	3.9	0.0
Nominal growth, per cent, year-on-year				
Private sectors disposable income	3.6	3.6	3.2	1.7
HICP	1.5	1.5	1.4	1.2
Hourly wages (industry)	2.7	1.9	1.6	0.4
House prices	1.8	-2.8	-5.6	-13.1
Average level for the year				
Bond yield, per cent p.a.	4.8	4.8	6.8	4.1
3-month money market interest rate, per cent p.a.	2.0	2.0	2.0	0.8
Unemployment, thousands	154.3	201.6	230.4	315.0
Total employment, thousands	2,713	2,665	2,637	2,552
- of which private sector, thousands	1,708	1,661	1,632	1,548
Labour force, thousands	2,867	2,867	2,867	2,867
Unemployment rate, per cent	5.4	7.0	8.0	11.0
Net borrowing/net lending, private sector, kr. billion	112.8	178.5	218.0	215.2
Government budget balance, kr. billion	-80.0	-112.6	-145.8	-163.9
B.o.p. current account, kr. billion	32.3	65.6	71.7	50.9
Crude oil price, dollar/barrel	86.5	86.5	86.5	86.5

PROFIT/LOSS

Table 2

Kr. million	Group 1			Group 2			The Danish Financial Supervisory Authority's Group 3		
	2009	2008	Index 09/08	2009	2008	Index 09/08	2009	2008	Index 09/08
Income									
Net interest income	51,436	36,553	141	7,064	6,149	115	9,737	9,295	105
Net fee income	13,497	14,188	95	2,018	2,151	94	2,689	2,780	97
Value adjustments	6,603	-3,274	-	913	-1,250	-	3,081	-312	-
Value adjustments of participating interests	4,293	5,809	74	-68	-63	107	-2,551	-49	-
Other income from ordinary activities	3,089	3,243	95	165	377	44	298	384	78
Expenses									
Operating expenses	40,770	37,466	109	6,941	5,741	121	12,008	10,683	112
Write-downs on loans	31,943	14,528	220	10,298	4,282	240	11,947	4,986	240
Profit/loss before tax	6,205	4,524	137	-7,148	-2,658	269	-10,701	-3,570	-
Profit/los safter tax	3,674	3,728	99	-5,371	-1,946	276	-10,321	-3,170	-

Source: Danish Financial Supervisory Authority.

BALANCE SHEET

Table 3

Kr. million	Group 1			Group 2			The Danish Financial Supervisory Authority's Group 3		
	2009	2008	Index 09/08	2009	2008	Index 09/08	2009	2008	Index 09/08
Selected assets									
Cash in hand, etc.	30,359	19,296	157	2,400	2,215	108	8,290	9,050	92
Claims on credit institutions and central banks	503,098	484,692	104	21,069	22,946	92	37,844	38,280	99
Loans	1,582,512	1,812,643	87	165,996	185,938	89	199,866	231,626	86
Bonds	897,139	799,801	112	56,425	38,742	146	50,658	39,319	129
Shares, etc.	10,526	8,822	119	4,758	4,098	116	8,468	8,348	101
Selected liabilities									
Debt to credit institutions and central banks	734,104	988,578	74	50,365	72,408	70	51,955	80,243	65
Deposits and other debt	1,278,915	1,322,761	97	149,219	140,593	106	201,346	195,754	103
Bonds issued	639,289	559,417	114	28,732	18,905	152	6,994	6,961	100
Subordinated debt	90,901	72,128	126	13,044	9,217	142	16,849	11,796	143
Equity	171,120	163,107	105	19,860	19,709	101	45,331	48,902	93
Total assets/liabilities	3,666,001	4,037,639	91	269,021	274,067	98	322,678	354,106	94

Note: Cash in hand, etc., is cash in hand and demand deposits with central banks. Lending and deposits are actual lending and deposits, not adjusted for mergers and acquisitions.
Source: Danish Financial Supervisory Authority.

CAPITAL STRUCTURE

Table 4

Kr. million	Group 1			Group 2			The Danish Financial Supervisory Authority's Group 3		
	2009	2008	Index 09/08	2009	2008	Index 09/08	2009	2008	Index 09/08
Tier 1 (incl. hybrid core capital)	188,158	151,056	125	24,146	19,348	125	45,074	44,543	101
Capital base	231,709	203,806	114	29,844	26,115	114	55,623	54,421	102
Risk-weighted assets	1,305,056	1,447,533	90	193,877	215,986	90	271,274	313,749	86

Source: Danish Financial Supervisory Authority .