Danmarks Nationalbank

Monetary Review 1st Quarter Part 1

2012

DANMARKS NATIONAL BANK 2012

MONETARY REVIEW 1st QUARTER 2012

The small picture on the front cover shows the "Banker's" clock, which was designed by Arne Jacobsen for the Danmarks Nationalbank building.

The Monetary Review is available on Danmarks Nationalbank's website:
www.nationalbanken.dk under publications.

Managing Editor: Per Callesen
Editor: Niels Lynggård Hansen

This edition closed for contributions on 16 March 2012.

The Monetary Review can be ordered from:
Danmarks Nationalbank,
Communications,
Havnegade 5,
DK-1093 Copenhagen K.
Telephone +45 33 63 70 00 (direct) or +45 33 63 63 63.
Inquiries: Monday-Friday 9.00 a.m.-4 p.m.
E-mail: kommunikation@nationalbanken.dk

Rosendahls-Schultz Grafisk A/S
ISSN 0011-6149
(Online) ISSN 1398-3865

Contents

Current Economic and Monetary Trends

SUMMARY

The global economy weakened in the 2nd half of 2011, chiefly as a result of the debt crisis in several European countries. The euro area gross domestic product, GDP, fell in the 4th quarter, but data releases point to stabilisation. In the USA there are signs of moderate growth and recovery in the labour market. Euro area unemployment continues to rise, but with considerable differences across member states. Inflation is declining at the moment as previous increases in energy prices are dropping out of the year-on-year increase, but recent oil price rises pose a risk in this connection. Yield spreads have narrowed following the most recent steps by the European Central Bank, ECB, which have to a large extent dampened market concerns about the banking sector and sovereign debt in a number of euro area member states.

The growth outlook is subdued. The latest consensus estimates and forecasts from the international organisations project a slight decline in euro area GDP in the first part of 2012, while other advanced economies are expected to display moderate growth rates. Considerable fiscal consolidation is underway in Europe in order to restore confidence in public finances and create a basis for sustainable growth. In contrast, monetary policy is highly accommodative and supports economic activity in the advanced economies.

Activity in Denmark rose by 1.0 per cent in 2011. Growth is expected to remain at the same level in 2012, rising to just over 1.5 per cent in the coming years.

Households and non-financial corporations continue to consolidate. The high level of private savings is accumulating over time, and at some point wealth will reach a level that the households and non-financial corporations find suitable. Subsequent normalisation of the currently low consumption ratio has the potential to boost growth considerably since private consumption accounts for around half of GDP.

Although interest rates are still low, the housing market is stagnant, driven by self-reinforcing expectations of further price falls. It is not possible to predict exactly when the market will begin to pick up, but when that happens, it could provide further stimulus to overall domestic demand.

The continued consolidation of public finances and reduction of public investment in 2013 to a normal level may be well timed in a cyclical perspective. It is also important to continue along the path of labour market reform.

THE INTERNATIONAL ECONOMY AND THE FINANCIAL MARKETS

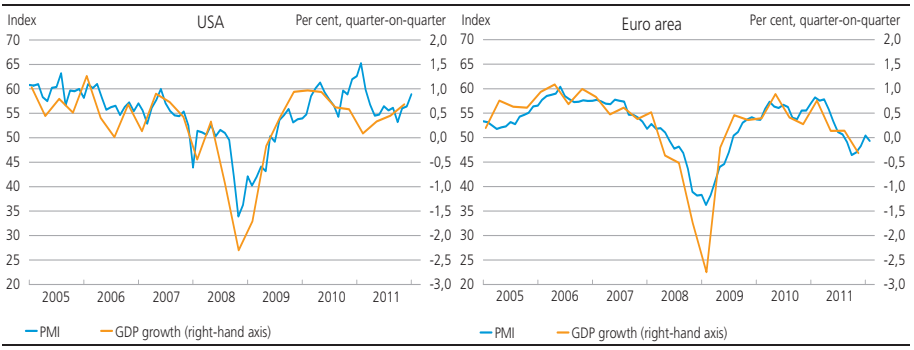
Economic developments

Global growth weakened in the 2nd half of 2011, chiefly as a result of the debt crisis in several European countries. Euro area GDP fell by 0.3 per cent in the 4th quarter, following a weak 3rd quarter with growth of only 0.1 per cent. The development in the euro area to some extent masked differences across member states. The German economy is still moving ahead, although growth was negative in the 4th quarter after strong growth in the preceding quarters. Conversely, activity is expected to continue to fall in Spain and Italy, following falls of 0.3 and 0.7 per cent, respectively, in GDP in the 4th quarter.

In the USA, economic activity picked up during the 2nd half of 2011 after a weak 1st half. The US economy showed robust growth in both the 3rd and 4th quarters, primarily driven by rising private consumption. The latter reflects an increase in car sales, among other factors. In Japan, GDP contracted by 0.6 per cent in the 4th quarter, mainly as a result of decreasing exports. In the emerging economies growth also slowed down, but remains solid.

Several indicators suggest that the decline in global economic growth will not continue, cf. Chart 1. This applies in e.g. the euro area, where the

PMI AND GDP GROWTH IN THE USA AND THE EURO AREA — Chart 1



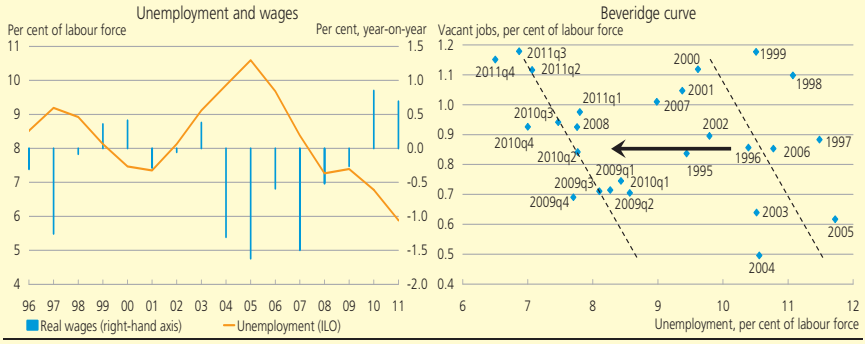
Note: The Purchasing Managers Index, PMI, is a composite indicator based on surveys for the manufacturing and service sectors, respectively, in which business managers assess the current situation in relation to the preceding month. A value of more (less) than 50 indicates expectations of economic expansion (contraction) compared with the preceding month. For the USA, a weighted average is applied of the ISM index for the manufacturing and non-manufacturing sectors, respectively, based on value added in 2010.

Source: Markit and Reuters EcoWin.

GERMANY'S LABOUR MARKET — Box 1

Since 2005, German unemployment has declined steadily, except in a brief period around the eruption of the financial crisis in the autumn of 2008. Particularly the post-crisis development is remarkable, considering the rise in unemployment in the rest of the euro area.

UNEMPLOYMENT, WAGES AND BEVERIDGE CURVE FOR GERMANY — Chart 2



Source: Reuters EcoWin.

The pronounced fall in unemployment since 2005 is primarily attributable to a number of social and labour market reforms implemented in Germany in the period 2003-05 – known as the Hartz reforms. Among other things, the first three Hartz reforms entailed streamlining of job centre services and stricter availability requirements for the unemployed. Furthermore, the rules on temporary jobs and "mini jobs" were eased with a view to facilitating entry into the labour market. The Hartz IV reform cut the average unemployment benefits, while also shortening the period of entitlement. The results of the reforms can be illustrated by a Beveridge curve, showing the link between the unemployment rate and the number of vacant jobs as a percentage of the labour force. Increasing the incentive to seek employment leads to a lower rate of unemployment for a given number of vacancies. The curve has shifted inwards since 2005, cf. Chart 2 (right), indicating that structural unemployment has declined.

Besides the reforms, increased flexibility in the labour meant that the effect of the financial crisis on German unemployment was limited. The unemployment rate rose only weakly from the autumn of 2008 to the summer of 2009. A contributory factor has been the *Kurzarbeit* initiative, which made it possible for more people to keep their jobs and hence their contact with the labour market during the crisis. To avoid being made redundant, employees worked fewer hours, and the central government compensated them for about two thirds of the loss of income. The initiative was a success because the sectors affected by the downturn were also the sectors that have subsequently recovered.

The combination of lower structural unemployment and dampened demand for labour has led to moderate German wage inflation since the mid-1990s. As a result, since the late 1990s, real wages have declined relative to those of other euro area member states. As productivity has developed more or less in parallel with the rest of the euro area, German firms have improved their competitiveness. The low wage increases are matched by a weak trend in private consumption, which has risen by a mere 5 per cent since 2000, compared with an increase of 15 per cent in the rest of the euro area and in Denmark.

[1] In a discussion paper by the Bundesbank, the Hartz IV reforms are estimated to have reduced structural unemployment by 2.8 percentage points (Michael U. Krause and Harald Uhlig, Transitions in the German labor market: Structure and crisis, Deutsche Bundesbank, *Discussion Paper*, Series 1: Economic Studies, No. 34, 2011.).

PMI in January and February was at a level that signals a more or less unchanged level of activity. For the USA, recent data releases indicate that the moderate growth will continue across sectors.

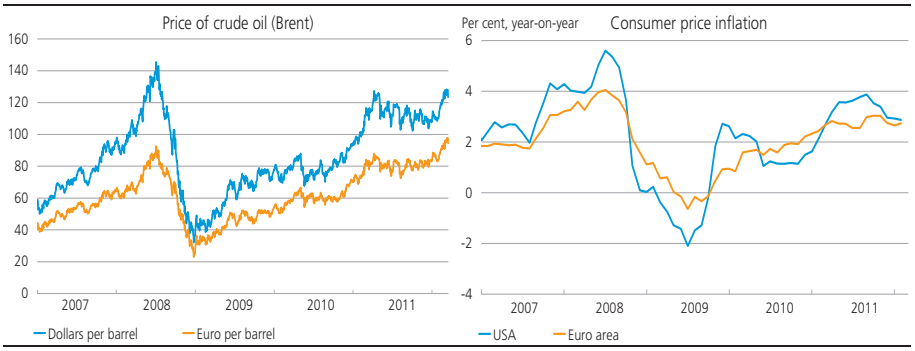
Due to the slowdown in economic activity, unemployment is rising again in most of the euro area, and for the first time in around 18 months employment fell in the 3rd quarter of 2011. In January unemployment stood at 10.7 per cent of the labour force. Germany is a notable exception, with steadily falling unemployment throughout the upswing. Underlying factors include extensive labour market reforms in the pre-crisis years and good wage competitiveness, cf. Box 1. Furthermore, the German economy was not overheated in the pre-crisis years and fiscal policy was tightened in time.

The US labour market is improving, with a positive trend in employment towards the end of 2011 and in early 2012. Unemployment fell to 8.3 per cent in January, but long-term unemployment remains considerable, and the labour force participation rate is lower than at the beginning of 2011.

Inflation has declined in the euro area and the USA in recent months as the effects of the oil price surges in late 2010 and early 2011 are no longer included in the annual rate of inflation. In the euro area, annual HICP inflation peaked at 3 per cent in October and stood at 2.7 per cent in February, cf. Chart 3.

All the same, recent months' rising oil prices entail a risk of higher inflation. The price of a barrel of (Brent) oil has risen to more than 120 dollars due to substantial underlying demand from the emerging economies and supply restraints as a result of restrictions against Iran, among other factors. Combined with the weakening of the euro against the dollar, this means that the price of a barrel of oil measured in euro is back at a level (above 90 euro) briefly seen in the summer of 2008, when

PRICE OF CRUDE OIL AND CONSUMER PRICE INFLATION IN THE USA AND THE EURO AREA — Chart 3



Source Reuters EcoWin.

the price of oil exceeded 140 dollars. The high level of oil prices is remarkable in view of the slowdown of the global economy, and further increases will pose a risk to growth, cf. below.

The financial markets

Financial conditions deteriorated notably in the autumn, reflecting uncertainty about sovereign-debt sustainability in the euro area member states with the largest debts. This led to turmoil in relation to euro area banks. Euro area sovereign debt markets and banks had a negative impact on each other. Rising government bond yields led to write-downs on bank portfolios of government bonds. This weakened the capitalisation of the banks and made it more difficult for them to procure liquidity in the money markets. The uncertainty surrounding the banks further increased concerns about government-debt sustainability in the most severely affected member states, thereby pushing up interest rates on sovereign debt even more. This interaction also led to weakening of the euro area money markets, and European banks' sources of dollar liquidity dried up.

The ECB implemented a number of measures to increase the banks' access to liquidity, cf. the section on monetary and exchange-rate conditions. Add to this the concerted action taken in November by the central banks of the largest advanced economies (Canada, the UK, Japan, Switzerland, the USA and the euro area) to ensure that banks had access to foreign-exchange liquidity.

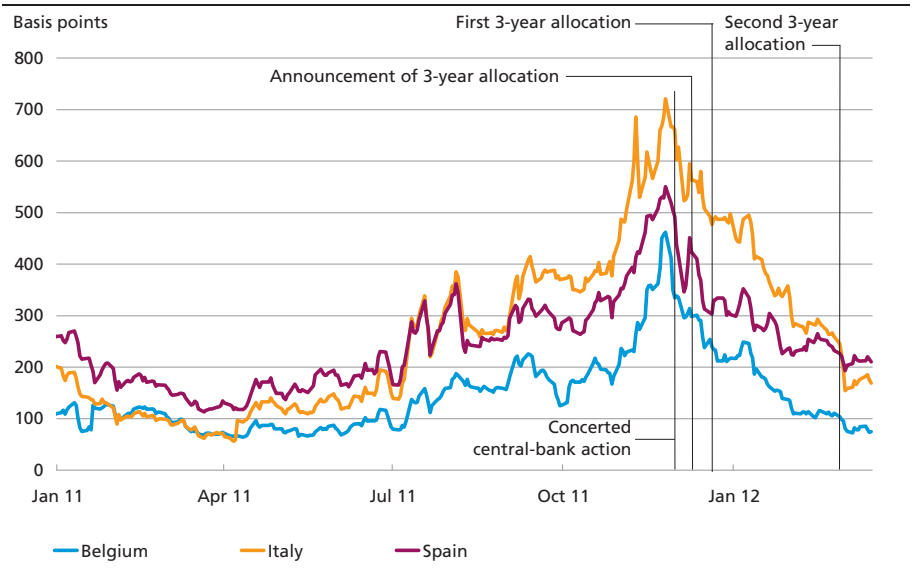
These measures had a positive impact on the financial markets and seem to have broken the negative spiral to a considerable extent. Especially the ECB's introduction of a 3-year lending facility and easing of its collateral requirements for liquidity are believed to have contributed strongly to the turnaround in the financial markets seen since December by reducing uncertainty about bank funding. Moreover, the new governments in Italy and Spain launched substantial fiscal consolidation programmes, which helped to restore confidence in the fiscal sustainability of these two member states. Finally, agreements were concluded on a new loan programme for Greece, cf. below.

Overall, this led to considerable easing of financial market conditions, which was reflected particularly in yield spreads for 2-year government bonds in the euro area, cf. Chart 4.

Yield spreads did not seem to be affected by the downgrading in January and February of a large number of euro area member states by the three large credit rating agencies (Fitch, Moody's and Standard & Poor's, S&P). In January, S&P also downgraded the European Financial Stability Facility, EFSF, by one notch to AA.

2-YEAR GOVERNMENT YIELD SPREADS TO GERMANY FOR SELECTED EURO AREA MEMBER STATES

Chart 4



Source: Bloomberg.

Despite stabilisation of the financial markets, it looks as if credit conditions will be tightened further in Europe. The ECB's most recent lending survey (a regular survey among bank credit managers) shows substantial tightening of bank credit standards in the 4th quarter, and further tightening is expected in the 1st quarter of 2012. This reflects the worsened macroeconomic outlook and the sovereign debt crisis. Another factor which may affect the banks' willingness to lend is the tighter capital requirement imposed by the European Banking Authority, EBA, on the largest European banks with effect from 1 July, following up on decisions made by the European Council. Besides increasing their capital, the banks may also seek to meet this requirement by reducing assets, including lending. The International Monetary Fund, IMF, has expressed concerns that this may contribute to the tightening of credit conditions and hence exacerbate the slowdown in the euro area. On the basis of a preliminary analysis of the banks' plans in respect of meeting the tighter capital requirements, the EBA in February concluded that they are not likely to contribute significantly to reducing bank lending.

Lending by banks to households and non-financial corporations has stagnated in the euro area, and especially consumer loans show a downward trend. In the USA, on the other hand, growth in lending to non-financial corporations was positive and rising, and the decline in lending to consumers has halted.

Stock indices picked up somewhat in the last part of 2011 and in early 2012. In the USA, last year's decline was more than made up for, while euro area equities remain below last spring's level despite sound increases in recent months.

The European Systemic Risk Board, ESRB, has been in operation since the beginning of 2011. Its objective is to contribute to preventing and reducing systemic risks in the EU's financial system, i.e. risks which could put the entire financial system and the economy under pressure, as seen before and during the present crisis. The ESRB's task is to draw attention to risks and if necessary to issue warnings and recommendations for measures to limit such risks. Since its establishment, the ESRB has adopted public recommendations with a view to limiting systemic risks in relation to lending in foreign currency and the banks' dollar funding. In addition, the ESRB in January 2012 recommended that all EU member states set up authorities to be responsible at national level for macroprudential policies, and that such authorities be empowered to conduct macroprudential policies on national initiative or as a follow-up to ESRB recommendations. By 30 June 2013, member states must submit final responses to the ESRB and the Ecofin as to how the ESRB's recommendation concerning national macroprudential authorities will be complied with. The ESRB recommends that such measures take effect on 1 July 2013 at the latest. In accordance with the ESRB's recommendations, Danmarks Nationalbank has encouraged the Danish government to set up a macroprudential council chaired by Danmarks Nationalbank. Among other things, Danmarks Nationalbank proposes that the council should undertake oversight of systemic risks and develop and recommend specific policy initiatives to be implemented by existing authorities. If an authority disagrees with the council, it may deviate from the council's decision, publicly stating the reasons for doing so.

The European Commission has proposed a European financial transaction tax, cf. Box 2. Such a tax would have a negative impact on financial stability by reducing liquidity in the money and capital markets. This would lead to higher interest rates and government bond yields, greater problems in relation to realising assets for banks and other non-financial corporations under pressure and less use of risk hedging of e.g. exchange-rate and commodity-price fluctuations.

Growth outlook

The latest consensus estimates and forecasts from the international organisations project a slight decline in euro area output in the first part of 2012, while other large advanced economies are expected to avoid negative growth rates. The consensus estimate (from February) shows

FINANCIAL TRANSACTION TAX Box 2

On 28 September 2011, the European Commission presented its proposal for a directive on a common system of financial transaction tax. This proposal should be viewed in the light of the conclusions of the G20 meeting in Toronto in 2010, where it was agreed that the financial sector should contribute to the costs of the financial crisis. However, no agreement on a financial transaction tax exists at G20 level. Instead, the Commission has proposed a tax at European level to be introduced on 1 January 2014.

Besides generating proceeds, the Commission aims for the financial transaction tax to 1) increase and harmonise taxation of the financial sector, and 2) create more robust financial markets, e.g. by reducing the number of "speculative" transactions. The Commission's proposal will entail taxation of trade in most types of financial instruments and will comprise trading both in regulated markets and over the counter. Trading in derivatives is to be taxed at 0.01 per cent, while other trading, including in equities and bonds, is to be taxed at 0.1 per cent. Taxation will be based on the counterparties' place of residence, not the transaction site. The Commission envisages that trading in the primary market and with central banks and international institutions will be exempt from taxation.

The IMF did not recommend a financial transaction tax in its report to the G20.[1] The reason given by the IMF was that such a tax is not targeted at the size of the financial institutions, their internal connectedness, etc., and hence it would not limit the primary source of systemic risks.

A number of factors related to such a tax could reduce financial stability. Even low tax rates will reduce turnover and liquidity in the financial markets and have a negative impact on the possibilities of raising capital and hedging risk. A less liquid market will make it more difficult for financial institutions to sell assets when under pressure. That, in turn, will make the markets less robust to shocks, which will have an adverse effect on financial stability. The transaction tax may also make the liquidity buffers to be introduced under Basel III less effective. In a less liquid market, it is more difficult for a bank to rely on its buffer. Furthermore, a financial transaction tax will make it more difficult for firms and others to hedge risk. This could reduce risk hedging, making non-financial corporations and financial institutions more vulnerable to market volatility. In addition, there is no basis for concluding that market volatility will fall after the introduction of the tax.[2] A further consequence of the lower liquidity is higher interest rates for government, the mortgage sector and firms. Bonds with lower liquidity generally entail higher market yields by way of compensation to investors.

Previous experience with financial transaction taxes has shown that financial transactions to a large extent move to places without taxation. For example, large volumes of Swedish equity trading relocated from Stockholm to London when Sweden introduced such a tax. Overall, Danmarks Nationalbank is of the opinion that a financial transaction tax will lead to greater instability in the EU financial markets. Conversely, the need for increased financial stability is addressed via the current initiatives to strengthen financial regulation launched by the Commission.

[1] Cf. Stijn Claessens, Michael Keen and Ceyla Pazarbasioglu, Financial Sector Taxation: The IMF's report to the G-20 and background material, September 2010.

[2] See note 1.

CONSENSUS ESTIMATES, GDP GROWTH IN SELECTED ECONOMIES Table 1

	2012				2013
Per cent	Apr 11	Jul 11	Oct 11	Feb 12	Feb 12
USA	3.3	3.0	1.9	2.2	2.5
Euro area	1.7	1.6	0.6	-0.3	0.9
Germany	1.9	1.9	1.0	0.6	1.5
France	1.7	1.7	0.9	0.0	1.0
Italy	1.1	1.0	0.0	-1.4	0.1
Spain	1.3	1.3	0.6	-1.3	0.3
Japan	2.7	3.1	2.2	1.8	1.4
UK	2.2	2.2	1.5	0.5	1.8

Note: Consensus estimates are the averages of a number of leading banks' and analysts' economic forecasts.
Source: Consensus Economics.

negative growth of 0.3 per cent in the euro area in 2012, cf. Table 1, which is in line with the European Commission's interim forecast from February, while the IMF in January expected a fall of 0.5 per cent in GDP. The negative outlook mainly relates to Italy and Spain, which in December announced further fiscal tightening, cf. below. For the USA, growth is estimated at a good 2 per cent in 2012, and expectations for the US economy have improved since the autumn against the background of more favourable data releases.

Several factors could lead to weaker-than-expected growth. The most pronounced risk factors are an actual credit crunch in the euro area because banks, affected by the sovereign debt crisis in combination with tighter capital requirements, seek to reduce their lending.

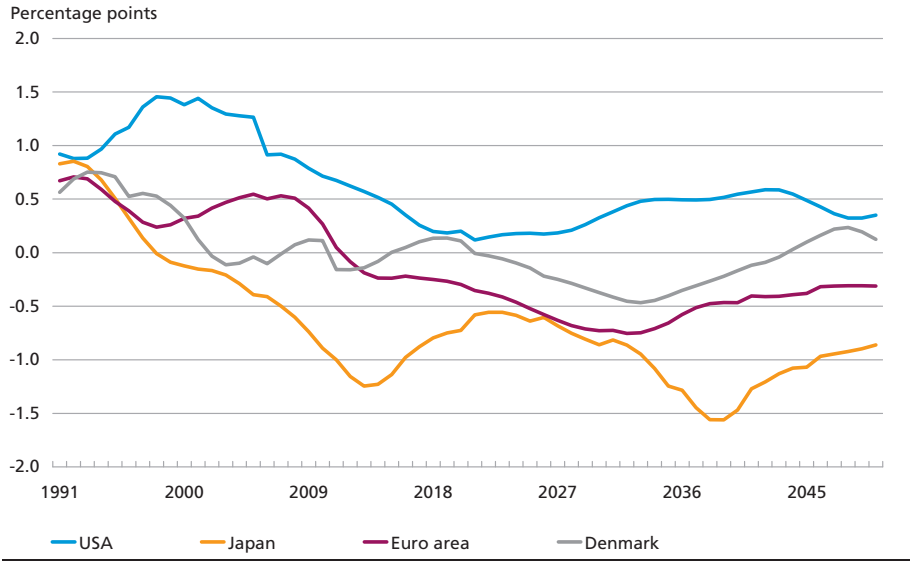
Another significant risk factor is the price of oil. If the oil price remains at the current level or rises further, this will halt growth. Such a development could be triggered by increasing demand from the emerging economies and limited supply capacity combined with continued risks in relation to Iran. In the OECD's assessment, an oil price increase of 10 dollars per barrel of crude oil would lead to a short-term decline of 0.2 percentage points in GDP growth in the advanced economies.[1]

Conversely, if the recent positive trends in the financial markets continue, this could have a positive impact on consumption and investment in the private sector.

Demographic changes are now pointing to lower potential growth in the USA and the euro area. Growth in the population aged 20-64 has been declining in recent years, cf. Chart 5, concurrently with the economic and financial crisis. The number of people in this age group is expected to decrease by 0.25 per cent annually in the euro area, com-

[1] OECD, *Economic Outlook*, May 2011.

GROWTH IN NUMBER OF 20-64-YEAR-OLDS Chart 5



Source: UN.

pared with annual growth of 0.5 per cent in the preceding decade, i.e. growth will dampen by 0.75 percentage points over a short span of years that coincides with the financial crisis. Likewise, population growth in the USA is slowing down. This contributes to a substantially lower growth potential in the coming decade than in the period leading up to the economic crisis.

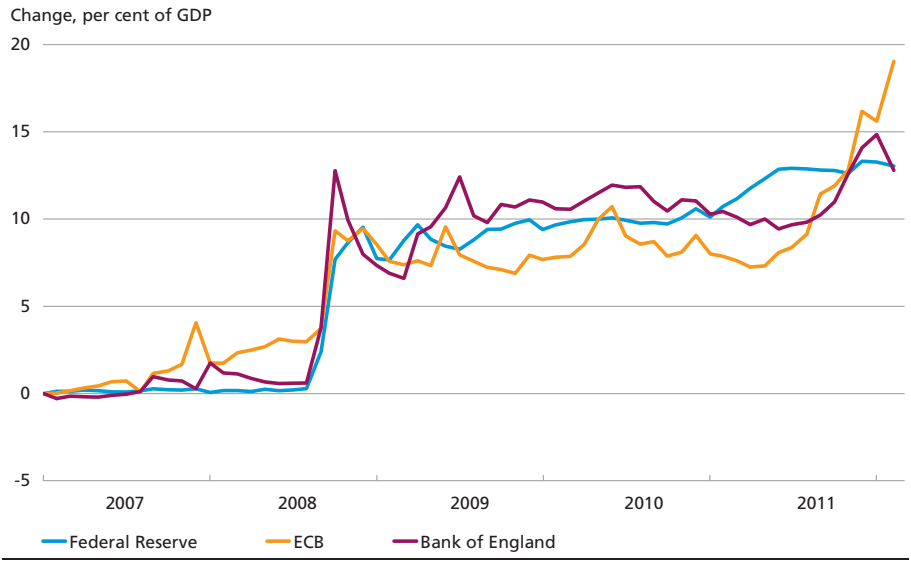
International economic policy

As mentioned above, the ECB in December announced a number of measures with a view to supporting bank lending and the money market. In addition, the ECB reduced its policy interest rate to 1 per cent. Other central banks have also eased monetary policy owing to the more subdued inflation outlook. In Sweden and Norway, monetary-policy interest rates have been cut by 0.5 percentage points, and both the Bank of England and the Bank of Japan have increased their purchases of government bonds.

Over the last year, the ECB's balance sheet has increased notably, to more than 30 per cent of the euro area GDP. This is attributable to the new measures, increased demand for monetary-policy loans from the ECB due to shortage of liquidity in the money markets, and purchases of government bonds. Central-bank balance sheets have increased by approximately 13 per cent of GDP in the USA and the UK and 19 per cent in the euro area since 2008, cf. Chart 6.

CHANGES IN CENTRAL-BANK BALANCE SHEETS IN THE EURO AREA, THE USA AND THE UK

Chart 6



Source: Reuters EcoWin.

The balance-sheet increases in the USA and the UK mainly reflect purchases of securities, including government bonds, i.e. quantitative easing. The ECB has to a more limited extent purchased bonds with a view to stabilising the monetary-policy transmission mechanism.[1]

Due to the weaker growth outlook and the diminishing inflationary pressures, there are widespread expectations in the financial markets that monetary-policy interest rates will remain low for quite a while. As stated above, the ECB cut its lending rate in December. The Federal Reserve, Fed, which has kept the fed funds target rate at 0-0.25 per cent since December 2008, has indicated that it expects to maintain an extraordinarily low level until the end of 2014. Furthermore, the Fed has introduced a more open communication strategy. Members of the Federal Open Market Committee, FOMC, now publish on a quarterly basis their expectations for the fed funds target rate at the end of the calendar year for the next few years and in the long term. In addition, the expected time of the first increase is also published. Interest-rate expectations are published along with the FOMC members' other macroeconomic projections. Moreover, the FOMC has officially declared that the natural level of price increases is 2 per cent, measured by the deflator

[1] For a more detailed discussion of the different aims underlying the ECB's, Federal Reserve's and Bank of England's asset purchases, see Niels Blomquist, Niels Arne Dam and Morten Spange, Monetary-policy strategies at the zero lower bound on interest rates, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2011, Part 1.

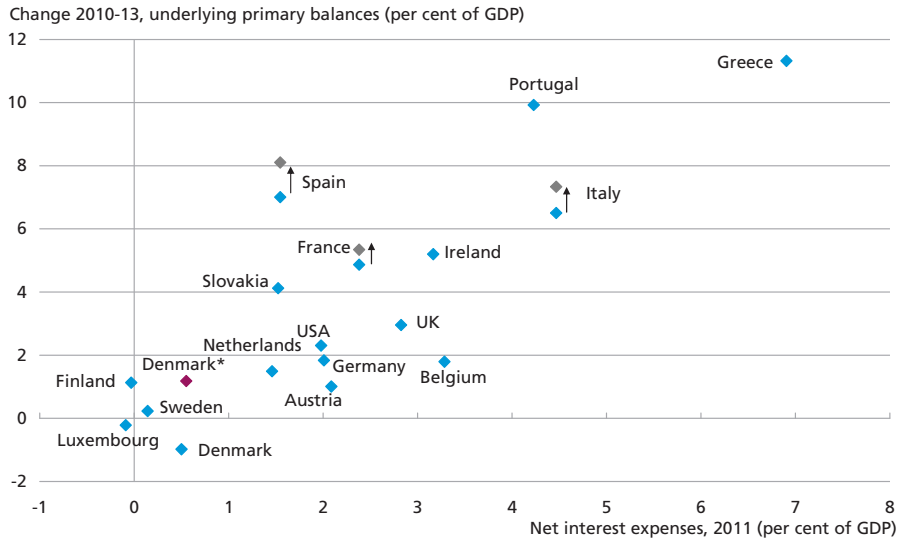
for private consumption, but that it is not possible to define a natural level of employment in the same manner.

As a new step, the Bank of Japan has also defined a specific target for price stability, namely consumer price inflation of 1 per cent.

In order to ensure sustainable public finances and restore market confidence, the advanced economies are implementing and planning considerable fiscal consolidation. In the euro area, significant budget tightening to the tune of 4 per cent of GDP is envisaged from 2010 to 2013. The member states with the largest interest burdens are implementing the most pronounced fiscal adjustments, cf. Chart 7.

At end-2011, the new governments in Italy and Spain announced further fiscal tightening in 2012 and onwards. However, Spain exceeded its target of a budget deficit of 6 per cent of GDP in 2011 by 2.5 percentage points, primarily due to regional budget overruns. As regards Italy, the most recent initiatives are assessed to be sufficient to achieve structural balance in 2013, i.e. adjusted for cyclical factors and special circumstances. France has brought forward a pension reform and taken other steps that will increase planned consolidation in 2012-16 by 1 per cent of

FISCAL CONSOLIDATION IN SELECTED COUNTRIES — Chart 7



Note: OECD estimates on underlying primary balances and net interest expenses based on information up to and including 22 November 2011. The grey dots indicate consolidation taking the new measures into account. The most recent measures for Greece have not been incorporated. The underlying primary balance is the government budget balance adjusted for cyclical and one-off effects, excluding net interest payments. The red dot for Denmark is based on the calculation made by the Ministry of Economic Affairs and the Interior (Economic Survey, December 2011), which shows an improvement of the underlying primary balance of around 1.2 per cent of GDP in the period 2010-13. The difference between the Ministry's and the OECD's calculations is attributable to, *inter alia*, different methods for calculating budget elasticity, and furthermore the Ministry makes separate adjustment for e.g. pension yield tax and North Sea income.

Source: OECD and Ministry of Economic Affairs and the Interior.

GDP. Greece has adopted and is implementing extensive fiscal consolidation measures from an extraordinarily weak point of departure. The Greek structural and fiscal challenges are of a nature that will make the country dependent on support from the euro area member states and the IMF for a considerable number of years. But it is a precondition that the Greek sovereign debt is sustainable. Consequently, it has been necessary to write down private creditors' portfolios of Greek government securities, cf. the article "Write-down of Greek debt and new EU/IMF loan programme" in this Monetary Review. The new loan programme is also based on an agreement for further substantial fiscal and structural reforms. According to the most recent projections until 2020, the combination of the reform programme and the write-down of the debt entails a reduction of the Greek public debt to below 120 per cent of GDP, compared with the current level of 160 per cent of GDP.

In late 2011, the euro area member states and a number of other EU member states agreed to strengthen fiscal cooperation and to contribute more lending resources to the IMF. With the Fiscal Compact, the participant member states undertake an obligation to introduce a fiscal rule in national legislation, preferably at constitutional level. The rule imposes a ceiling of 0.5 per cent of GDP on the member states' annual structural government budget deficits. It must also include an automatic mechanism for correcting any deficit that exceeds this limit. The rule aims to ensure better compliance with the Stability and Growth Pact's objective of public finances in balance or surplus.

Besides observation of the 3-per-cent requirement for the actual budget balance, focus in the pre-crisis years was on annual improvement of the structural balance by at least 0.5 per cent of GDP as a main rule for member states not meeting the objective of structural balance or surplus. In practice this has not been sufficient because the point of departure was weak. Combined with overrating of the structural balance during the upswing preceding the financial crisis, this caused the public debt to increase over the business cycle. The requirement for structural balance on the government budget every year reduces the probability that total debt as a ratio of GDP will grow over time.

Financial stability and a balanced upswing require sufficient confidence in European public finances. Hence it is necessary for the EU member states to implement the planned fiscal adjustments. The highly accommodative monetary-policy conditions will support growth and help to mitigate the impact of fiscal tightening. The combination of accommodative monetary policies and fiscal consolidation in particularly vulnerable member states with large deficits will also help to correct the imbalances within the euro area. However, it is essential that macroeco-

nomic policies go hand in hand with structural reforms, especially with a view to boosting competitiveness and the growth potential in deficit member states.

MONETARY AND EXCHANGE-RATE CONDITIONS

In recent months, the Danish krone has been stable vis-à-vis the euro at a level slightly stronger than its central rate in ERM II. The strengthening of the krone in the 2nd half of 2011 meant that the deviations from the central rate in mid-December and mid-February were the largest seen since 2004, at around 0.4 per cent, which is, nevertheless, still low compared with the ERM II fluctuation band of +/- 2.25 per cent.

Following Danmarks Nationalbank's interest-rate reductions on 9 and 16 December 2011, respectively, the krone briefly weakened a little, only to return to a level of around 7.432 kroner per euro. The strong exchange rate of the krone should be viewed against the backdrop of an increased inflow of capital. Part of the reason was a decrease in Danish insurance companies and pension funds' demand for Danish government bonds in early December 2011 in the wake of the sovereign debt crisis in parts of the euro area. As Danish government bond yields fell relative to their German counterparts, the insurance and pension sector had an increasing need to purchase Danish government securities, cf. the article "Pension savings" in this Monetary Review.

In December, Danmarks Nationalbank purchased foreign exchange for kr. 17.8 billion related to intervention. Danmarks Nationalbank did not intervene in January and February. At end-February, the foreign-exchange reserve was kr. 498.7 billion, representing an increase of kr. 31 billion since end-November 2011. Besides intervention in the foreign-exchange market, the increase is to a large extent attributable to the annual value adjustment of the foreign-exchange reserve, amounting to kr. 10.2 billion in 2011.[1]

In early December, the ECB announced a number of measures to support the functioning of the money market and liquidity among euro area banks, cf. Box 3. The ECB conducted the first of its two 3-year liquidity operations on 21 December. Demand was high, with 523 euro area banks making use of the facility and allotments totalling 489 billion euro. As a result, the banks' excess liquidity and deposits with the ECB rose strongly, and the overnight interest rate in the euro area fell to a

[1] For a more detailed description of Danmarks Nationalbank's foreign-exchange reserve and value adjustment of this reserve, see the article "Danmarks Nationalbank's earnings and risk during the crisis" in this Monetary Review.

level closer to the ECB's deposit rate. In early January the positive impact of the 3-year loans was reflected in the activity in the European money market, where the slightly longer and uncollateralised interest rates also fell. The second 3-year operation by the ECB took place on 29 February 2012. 800 counterparties participated in the auction, with bids and allotments reaching 530 billion euro. Sovereign debt markets in the euro area improved, particularly after the ECB's first 3-year allocation, cf. the section on the international economy and the financial markets. In January, Spanish and Italian banks increased their holdings of government bonds by 23 and 21 billion euro, respectively.

ECB MEASURES IN DECEMBER 2011 Box 3

On 8 December 2011, the ECB announced several measures to support the banks' liquidity position and lending to households and non-financial corporations. The banks' access to pledge their own credit claims as collateral when borrowing from the ECB was temporarily extended to include credit claims assessed by seven national central banks to satisfy certain eligibility criteria, whereas it was previously necessary for them to be assessed under the Eurosystem's credit assessment framework.[1] The liabilities in relation to accepting bank credit claims as collateral are to be borne by the national central bank accepting them. Furthermore, the rules on the eligibility of asset-backed securities and bank credit claims as collateral under the Eurosystem's credit assessment framework were eased.

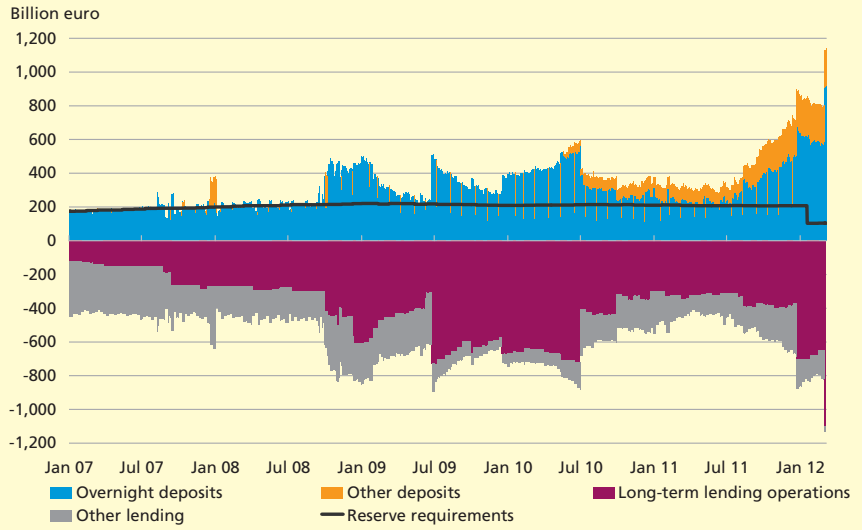
In addition, the ECB's reserve ratio for the banks, i.e. the minimum average deposit at the national central bank over a maintenance period, was reduced from 2 to 1 per cent of the banks' liabilities in the form of short-term deposits, debt instruments issued and money-market securities. The ECB also decided to discontinue its fine-tuning operations at the end of each maintenance period. Finally, the ECB offered 3-year loans on 21 December 2011 and 29 February 2012, respectively. The rate of interest in these operations will be the average rate of the main refinancing operations over the life of the respective operation. The loans may be repaid prematurely after one year. In the period since the eruption of the turmoil in the financial markets in the summer of 2007, the ECB's longer-term refinancing operations have constituted the largest part of its lending. Total lending exceeds the amount needed to cover the banks' liquidity requirements resulting from the autonomous items and from the ECB's reserve requirements. Consequently, the banks' demand deposits at the ECB have generally been higher than their liquidity requirement.

Long-term lending increased substantially in June 2009 when the ECB offered 1-year loans at a fixed rate of interest, cf. Chart 8. The ECB's total lending declined when these loans matured, but increased again when the ECB conducted the 3-year operation for 489 billion euro in December 2011. According to the ECB, there are indications that the liquidity allotted has circulated in the money market among euro area banks, as the banks raising 3-year loans are generally not the same as those placing deposits.

(continued)

CONTINUED Box 3

THE BANKS' LOANS FROM AND DEPOSITS AT THE ECB Chart 8



Note: Lending has a negative sign, deposits a positive sign. Daily observations. Overnight deposits include deposits in reserve accounts and standing facility deposits. Other deposits are the ECB's fixed-term deposits. Long-term lending operations are the ECB's longer-term refinancing operations (LTRO). Other lending comprises the ECB's standing lending facility, main refinancing operations and fine-tuning operations (MRO and OT), of which the weekly MROs account for the largest part by far.

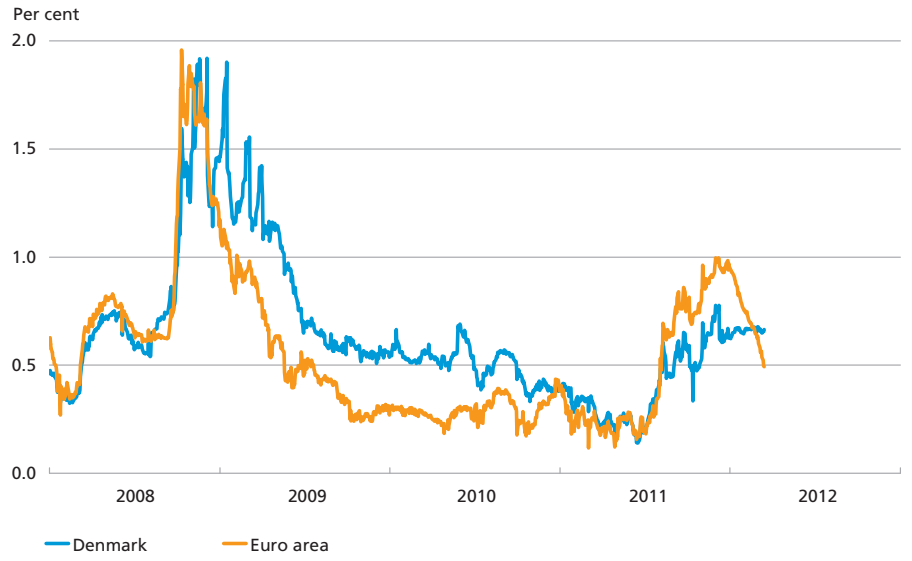
Source: ECB.

[1] The seven central banks authorised to apply special national assessments and rules to credit claims which may be pledged as collateral to the ECB are the Central Bank of Ireland, Banco de España, Banque de France, Banca d'Italia, Central Bank of Cyprus, Oesterreichische Nationalbank and Banco de Portugal.

The improved conditions in the euro area money market were also reflected in Denmark. In January and February, several of the large banks raised uncollateralised senior debt in the European market. This was the first time Danish banks issued securities in the international capital market since May 2011. Money-market interest rates mirrored Danmarks Nationalbank's interest-rate reduction in December. From end-December to end-February, the spread between uncollateralised and collateralised money-market interest rates in the euro area narrowed considerably due to the decrease in uncollateralised interest rates. In Denmark, the spread was more or less unchanged in the same period, and in early March 2012 it was at about the same level as in the euro area, cf. Chart 9. In 2009 and 2010, the Danish spread was wider than that of the euro area, one of the reasons being that uncollateralised Danish interest rates fell more slowly than their European counterparts.

The spread between the rate of interest on certificates of deposit and the current-account rate narrowed to 0.05 percentage points when Danmarks Nationalbank reduced its interest rates on 16 December 2011.

3-MONTH SPREAD BETWEEN UNCOLLATERALISED AND COLLATERALISED MONEY-MARKET INTEREST RATES IN DENMARK AND THE EURO AREA Chart 9



Note: Uncollateralised interest rates are Cibor and Euribor. Collateralised interest rates are given by interest-rate swaps. The most recent observations are from 14 March 2012.
Source: Reuters EcoWin.

The relatively lower return on certificates of deposit has made it more attractive for the monetary-policy counterparties to place liquidity in current accounts, and current-account deposits have increased. As a result, the probability that the counterparties' current-account deposits are converted into certificates of deposit has increased. In January, Danmarks Nationalbank for the first time since 2006 converted current-account deposits into certificates of deposit as the monetary-policy counterparties' aggregate current-account balance exceeded the limit of kr. 23.5 billion.

In early December, Danmarks Nationalbank announced the option for monetary-policy counterparties to raise 3-year loans, and in mid-January the conditions for such loans were published. This facility will be offered on 30 March and 28 September 2012. Loans must be collateralised, and as in its other lending operations Danmarks Nationalbank uses an open window so counterparties are free to determine the volume of loans. The rate of interest will be variable, mirroring Danmarks Nationalbank's 7-day monetary-policy lending rate plus an interest premium. Until 31 July 2013, the interest premium will be zero. If after this date Danmarks Nationalbank finds that access to funding in the money and capital markets has normalised, the premium will be increased. Loans from Danmarks Nationalbank give the banks an opportunity to raise longer-term

funding, which may help to strengthen their liquidity position in the short term. 3-year loans raised from Danmarks Nationalbank can be included as stable funding when calculating the funding ratio in the Danish Financial Supervisory Authority's supervisory diamond, cf. the article "Liquidity of Danmarks Nationalbank and the banks" in this Monetary Review.

Capital markets

In early March 2012, the political parties behind the bank rescue packages concluded an agreement on a number of initiatives to facilitate the funding of small and medium-sized enterprises in particular. These initiatives, known as the Development Package or Bank Rescue Package 5, are described in Box 4.

In early February, the Danish Financial Supervisory Authority presented a proposal for tighter rules on banks' loan impairment charges. The proposal entails that in future the banks must write down loans to distressed property customers to the value of the properties. In addition, the criteria for an objective indication of impairment of loans are specified in more detail. The proposal seeks to prevent banks from including uncertain future payments when calculating their need for loan impairment charges. The aim is to make the banks' loan impairment charges more credible and increase faith in bank financial statements. In the assessment of the Danish Financial Supervisory Authority, most banks already have a practice for writing down property loans which is in line with this proposal. For a small group of banks, however, the proposal is expected to lead to higher loan impairment charges. Danmarks Nationalbank supports the proposed amendments, which will reduce the risk of heterogeneous practices within the sector. Experience from the financial crisis shows that some banks were too optimistic when assessing the need for loan impairment charges. On several occasions, the Danish Financial Supervisory Authority's inspections have revealed a need for further loan impairment charges which suddenly called into doubt the relevant bank's ability to continue as a going concern. So a more uniform and prudent practice is required in this area. For a more detailed description of the rules governing loan impairment charges in bank financial statements, see the article "Models for banks' loan impairment charges in stress tests of the financial system" in Part 2 of this Monetary Review.

The banks' and mortgage banks' interest rates and lending

The yields on both short-term and long-term mortgage bonds are very low. Having fallen slightly from late October to early January, yields re-

BANK RESCUE PACKAGE 5[1] Box 4

Bank Rescue Package 5 includes the following initiatives:

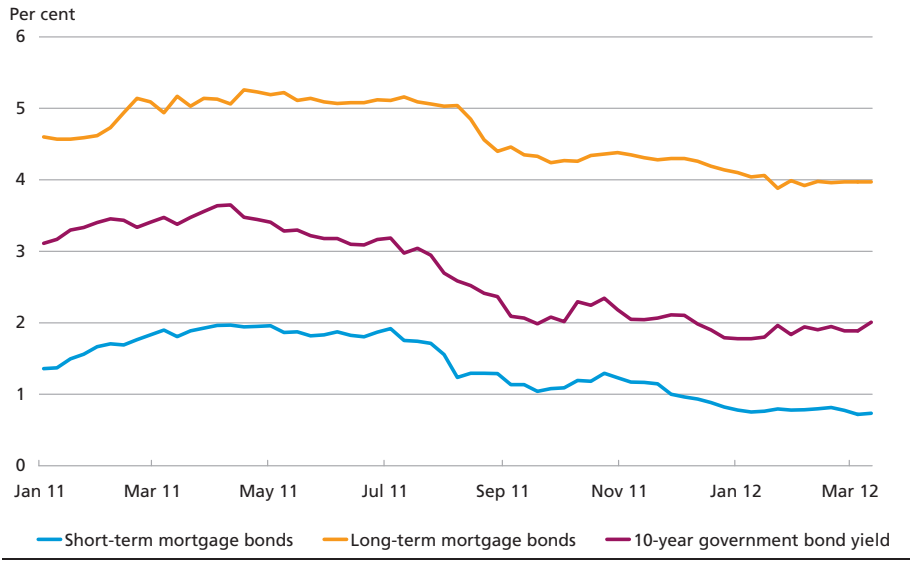
- The Financial Stability Company will acquire a portfolio of property-related loans from FIH Erhvervsbank. This transaction is to strengthen FIH Erhvervsbank's funding opportunities and help to restore the bank as a specialist business bank for small and medium-sized enterprises. More specifically, the model entails that FIH Erhvervsbank hives off property exposures for approximately kr. 17 billion to a new company to be transferred to the Financial Stability Company. At the same time, the Financial Stability Company will take over the financing of these exposures so that FIH Erhvervsbank acquires liquidity, which is to be used to repay debt with an individual government guarantee. The transfer will take place at estimated market values and in accordance with the rules on government subsidies. The objective of the new company will be to wind up the exposures as soon as possible, in a financially responsible manner and in a fair and proper way. In principle, this process should be completed by 31 December 2016, but extension for up to three years is possible. The Financial Stability Company has been ensured full compensation from FIH Holding, should it incur financial losses.
- It is planned to set up a specialist institution for funding the agricultural sector (*landbrugsfinansieringsinstitut*, LFI) to provide facility funding for farms run by efficient entrepreneurs and new, young farmers. The LFI is to take over viable agricultural exposures from the Financial Stability Company and other banks. Such exposures will be transferred only if the farmer in question and his bank agree. The LFI is to operate on market terms in line with other financial enterprises and may not distort competition, either between banks or between farmers funded by the LFI and farmers funded by other banks. Among other things, the initiative is aimed at softening the tight financial situation which prevents structural adjustment and development in the agricultural sector.
- The opportunities for the EKF (the state investment fund *Vækstfonden* and the Danish export credit agency) to provide guarantees and loans are to be strengthened. For example, the EKF export lending scheme will be increased by kr. 15 billion, while the framework for loan guarantees will be expanded by kr. 550 million. Moreover, a new scheme will be set up, under which Vækstfonden will be able to issue subordinated loans to small and medium-sized enterprises within a framework of kr. 500 million. Such loans are to facilitate growth and change of ownership and to contribute to higher solvency, which will increase firms' opportunities for achieving sustainable growth.

[1] Agreement of 2 March 2012 between the Danish government (Social Democrats, Social-Liberal Party and Socialist People's Party) and the Liberal Party, Danish People's Party, Conservative Party and Liberal Alliance on a number of development initiatives.

mained more or less stable until mid-March. The yield on 1-year non-callable fixed-rate bullet bonds ("fixed bullets") used for financing adjustable-rate loans was 0.7 per cent in mid-March, while the yield on long-term mortgage bonds was 4.0 per cent, cf. Chart 10. The auctions for bonds underlying mortgages with interest-rate adjustment in April 2012 proceeded smoothly. The volume sold was kr. 180 billion, and the yield on 1-year bonds averaged approximately 0.9 per cent. In early

YIELDS ON DANISH MORTGAGE BONDS AND THE 10-YEAR GOVERNMENT BOND YIELD

Chart 10



Note: The short-term yield is the 1-year yield on fixed bullets. The long-term yield is an average yield to maturity based on 30-year fixed-rate callable mortgage bonds. The most recent observations are from 14 March 2012.
Source: Nordea Analytics, Association of Danish Mortgage Banks and Danmarks Nationalbank.

January, the mortgage banks began to issue 30-year bonds at 3.5 per cent. Demand has been high for these loans, and in January issuance of 3.5-per-cent bonds accounted for just over one quarter of the mortgage banks' total gross new lending. However, variable-rate loans still made up the greatest part of gross new lending.

Over the last year, most mortgage banks have announced that they will raise their administration margins, especially for adjustable-rate and deferred-amortisation loans, citing increasing costs and collateral requirements as the reasons. Nykredit has announced that it will introduce two-tier mortgaging for owner-occupied housing during 2012, so that only up to 60 per cent of the property value can be mortgaged under the rules for SDOs, covered bonds. The interval from 60 to 80 per cent of the property value will be mortgaged using traditional mortgage bonds, and for this part of the mortgage neither 1-year adjustable-rate nor deferred-amortisation loans may be applied. Realkredit Danmark is also planning to alter its lending model in future so that properties are valued on the basis of a long-term price assessment.

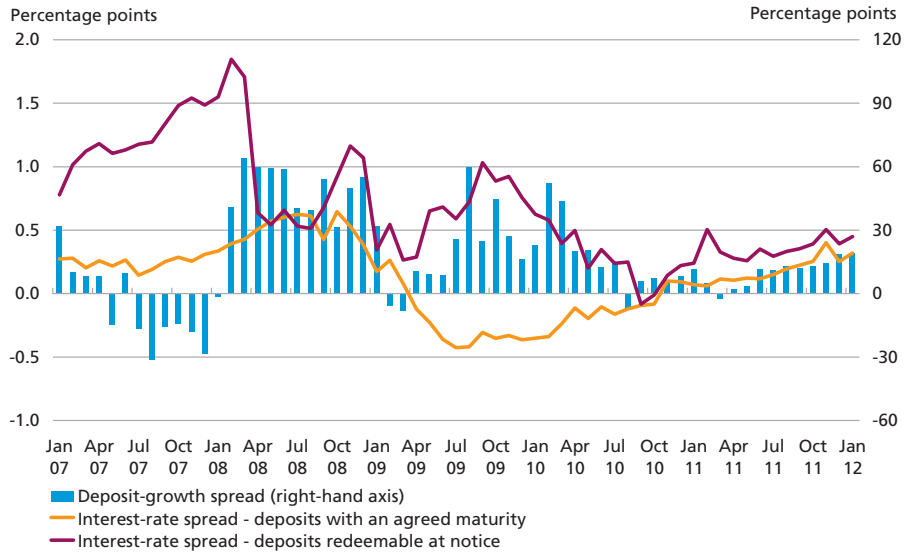
The yield on Danish 10-year government bonds was more or less unchanged in January and February. After having been slightly lower than its German counterpart throughout most of November and December 2011, the yield in the first months of 2012 mirrored the German one with

a spread of around 0 percentage point. The heavy demand for Danish government bonds towards the end of 2011 was also reflected in the T-bill auction on 29 December, at which the Danish government for the first time ever sold T-bills at a negative rate of interest. T-bills with maturities of 2 and 5 months sold at -0.21 and -0.07 per cent, respectively.

From end-November 2011 to end-January 2012, Danmarks Nationalbank's interest-rate reductions were partly reflected in the banks' interest rates for non-financial corporations, which declined by 0.2 percentage points, while lending rates for households were more or less unchanged. In the same period, deposit rates fell by 0.2 and 0.1 percentage points, respectively. But for the full year 2011, the banks' average lending rates for households and non-financial corporations rose by more than the monetary-policy interest rates. Lending rates rose by around 0.6 percentage points, while deposit rates rose by a mere 0.2 percentage points for households and remained virtually unchanged for non-financial corporations.

Over the last year, some banks have increased their focus on reducing their customer funding gaps, intensifying the competition for deposits. There has been a tendency for the spread between the medium-sized and large banks' deposit rates to widen, cf. Chart 11. This is particularly

SPREAD BETWEEN MEDIUM-SIZED AND LARGE BANKS' DEPOSIT RATES AND DEPOSIT GROWTH — Chart 11



Note: Large and medium-sized banks are defined on the basis of the Danish Financial Supervisory Authority's groups 1 and 2 for 2011. The deposit-growth spread is the difference between medium-sized and large banks' year-on-year growth in deposits with an agreed maturity and deposits redeemable at notice from households. The most recent observations are from January 2012.

Source: Danmarks Nationalbank.

pronounced for fixed-rate deposits in the form of deposits with an agreed maturity and deposits redeemable at notice. Especially for deposits from households, there has also been a tendency for the medium-sized banks' growth in deposits to exceed that of the large banks.

In early February 2012, Sydbank and Jyske Bank announced a cooperation agreement with BRFkredit on joint financing of housing loans. This means that the banks can transfer their customers' housing loans to BRFkredit, which can issue SDOs, covered bonds by way of financing. The agreement enables Jyske Bank and Sydbank to offer housing loans mortgaged on the home and financed in the same way as mortgage loans. Previously, Danske Bank was the only bank to finance loans by issuing covered bonds.

In January 2012, the banks' and mortgage banks' seasonally adjusted lending to households grew by kr. 6.4 billion, while lending to non-financial corporations grew by kr. 1.2 billion. The financial institutions' total lending to households and non-financial corporations has been more or less unchanged for the last three years, with lending by mortgage banks making a positive contribution to growth, while bank lending has made a negative contribution.

Danmarks Nationalbank's lending survey for the 4th quarter of 2011 showed that the banks and mortgage banks have tightened their credit policies vis-à-vis non-financial corporations a little. Unlike in the preceding quarter, it was mainly the banks that reported tightening; especially for the large banks this was to some extent done by raising prices. The banks and mortgage banks stated that demand for loans from existing corporate and retail customers declined somewhat in the 4th quarter.

THE DANISH ECONOMY

Activity increased by 1.0 per cent in 2011. The positive growth rate is mainly attributable to higher exports, while private consumption and private investment remained virtually unchanged, cf. Table 2 and Chart 12. Public consumption fell by 0.7 per cent. Measured on a yearly basis this is the first time since 1990 that a fall in public consumption has been registered.

Towards the end of the year, private consumption picked up again for the first time in more than a year, reflecting higher car sales, among other factors. This contributed to growth of 0.2 per cent in the economy in the 4th quarter, adjusted for price developments and seasonal patterns. In the preceding quarter, GDP fell slightly, so growth in the 2nd half of 2011 was around zero.

KEY ECONOMIC VARIABLES Table 2

Real growth on preceding period, per cent	2011	2012	2013	2014	2011 Q2	2011 Q3	2011 Q4
GDP	1.0	1.2	1.6	1.7	0.2	-0.1	0.2
Private consumption	-0.2	1.1	1.7	1.6	-0.3	-0.4	1.3
Public consumption	-0.7	0.9	0.5	0.4	1.1	-1.4	-0.2
Residential investment	8.5	0.3	3.0	2.7	1.9	0.6	-3.4
Public investment	9.5	10.6	-19.9	0.7	24.9	-4.0	5.8
Business investment	-4.5	5.5	7.2	6.8	2.4	2.2	-0.6
Inventory investment[1]	0.2	0.2	0.0	-0.1	0.1	0.6	-1.1
Exports	7.1	1.9	3.4	3.7	-0.5	0.4	0.5
Industrial exports	6.4	3.0	5.5	5.7	5.6	-0.4	-1.0
Imports	5.4	3.3	3.5	4.0	1.5	1.0	-0.7
Employment, 1,000 persons	2,736	2,738	2,746	2,761	2,741	2,727	2,734
Gross unemployment, 1,000 persons	163	161	159	150	161	164	162
Net unemployment, 1,000 persons	109	109	111	106	108	110	109
Balance of payments, per cent of GDP	6.5	5.6	5.7	5.5	6.5	6.3	5.7
Government balance, per cent of GDP	-2.3	-5.0	-2.7	-2.0	-1.6	-3.1	-3.5
Cash prices, per cent year-on-year	-3.4	-3.3	3.2	2.2	-1.0	-4.9	-8.1
Consumer prices, per cent year-on-year	2.7	2.5	1.8	1.8	2.9	2.6	2.6
Hourly wages, per cent year-on-year	2.3	2.3	2.5	2.7	2.2	2.3	2.5

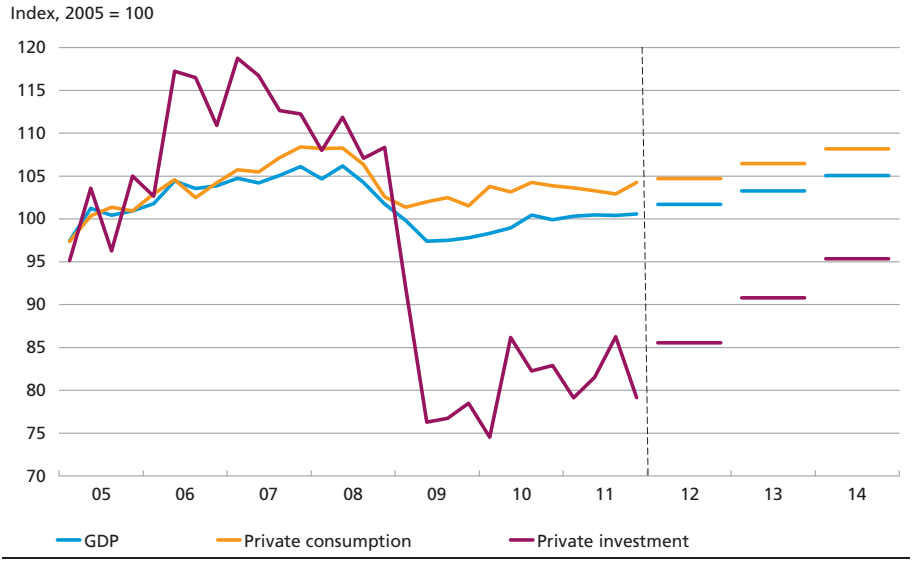
[1] Contribution to GDP growth.
Note: Calculations are based on statistical information available up to and including 12 March 2012.

Despite the positive trend in private consumption in the 4th quarter, households still seem to be consolidating. The savings ratio has now reached the same high level as in 2002. The decline in wealth due to falling house and equity prices entails that a larger share of the households' assets are now loan-financed.

The high level of private savings is accumulating over time, and at some point wealth will reach a level that the households and non-financial corporations find suitable in view of the circumstances. In this context, loss of wealth on housing and equity portfolios will be taken into account. Taking 2005, when the output gap was close to zero, as the point of departure, the private sector's wealth has risen considerably, cf. Chart 13. But for the households alone wealth is currently slightly below the 2005 level.

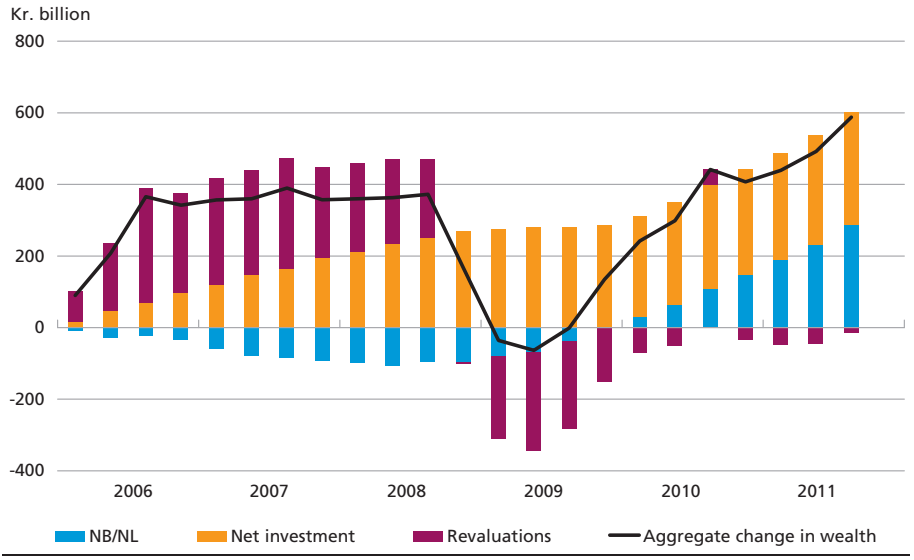
Normalisation of the currently low consumption ratio could potentially lead to considerable growth since private consumption accounts for around half of GDP. This year some positive growth is expected in house-

GDP, PRIVATE CONSUMPTION AND PRIVATE INVESTMENT — Chart 12



Note: GDP, private consumption and private investment in volumes. Private investment comprises business and residential investment. The projection is shown as annual averages.
Source: Statistics Denmark and Danmarks Nationalbank's forecast.

PRIVATE-SECTOR WEALTH — Chart 13



Note: Accumulated values since 2005. "NB/NL" shows the contribution from net borrowing/net lending, i.e. the net acquisition of financial assets. Net investment shows the acquisition of real assets. "Revaluations" are capital gains/losses on owner-occupied housing and equity portfolios.
Source: Statistics Denmark and own calculations.

hold real disposable income. Add to this the disbursement of accumulated early retirement contributions for those leaving the scheme.

Seasonally adjusted housing construction grew by more than 8 per cent in 2011, mainly as a result of high activity in the social housing sector. But growth in construction activity declined over the year and was negative in the 4th quarter. Private investment was more or less flat at a low level in 2011, reflecting factors such as sustained spare capacity, but also a much lower level of residential investment than before the crisis.

A large share of the private sector's savings surplus is placed in non-financial corporations. This provides a basis for boosting corporate investment as capacity needs to be increased to meet rising demand. Even if demand remains unchanged, there will eventually be a need for investment simply to maintain a given capital stock. Looking ahead, investment is expected to rise from the current low level so that it will once again make a positive contribution to growth.

The dampened trend in activity in the euro area and among some of Denmark's other trading partners means that exports will grow more slowly in 2012 than in 2011, cf. Appendix 1. However, the impact is mitigated by the low cyclicality of many Danish exports and by the weakening of the effective exchange rate of the krone since the autumn. Viewed in isolation, that improves the competitiveness of Danish firms. Exports are expected to be higher in the coming years than this year.

Despite the spare capacity in the Danish economy, imports have risen at a faster rate than output over the last two years. This reflects an underlying tendency towards increased international division of labour, which is expected to continue over the projection horizon. Imports will grow more than exports in 2012, with the Danish economy growing faster than those of Denmark's trading partners.

Growth in GDP is estimated at just over 1 per cent in 2012, corresponding to the level in 2011, as there is a weak trend in many of Denmark's largest export markets and Danish households and non-financial corporations are expected to remain hesitant despite low interest rates. However, output growth is expected to be somewhat stronger in Denmark than in the euro area. In 2013 and 2014 growth is expected to rise to just over 1.5 per cent. No significant labour market improvement is expected, and hence wage inflation is estimated to be in the range of 2.5 per cent annually.

Uncertainty about e.g. oil prices, the debt crisis and developments in general, particularly in the euro area, pose downside risks to the projection. Conversely, if the private sector begins to unleash its potential for increased consumption and investment, growth could be stronger than estimated.

Housing market

A moderate increase in house prices in the 2nd half of 2009 and throughout 2010 made way for a sharp decline in 2011. According to Statistics Denmark's monthly statistics, which are based on approximately 70 per cent of all trades when published, the price of single-family and terraced houses fell by 8.7 per cent from December 2010 to December 2011. The price of owner-occupied flats fell similarly, with a particularly strong downward trend towards the end of the period. According to quarterly statistics from the Association of Danish Mortgage Banks and others, house prices were falling in all regions of Denmark until the 3rd quarter of 2011.

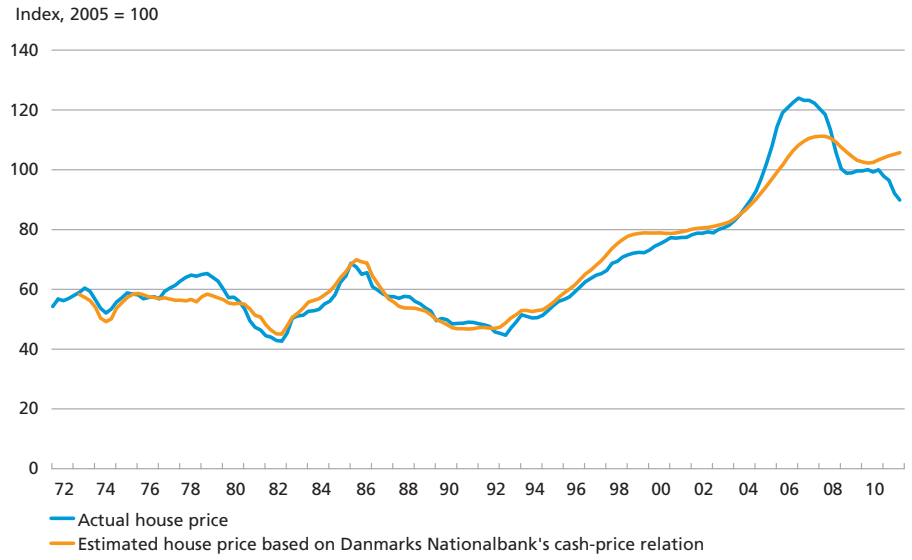
The number of house trades has been flat in recent months, at around two thirds of the average level for recent decades. The December figure is lower, but will subsequently be adjusted upwards as changes of ownership are officially registered. The number of homes for sale has declined since last summer. However, this is not because sales have picked up, but because fewer homes are put on the market. The many homes for sale and the low turnover have led to a further increase in time on market, to an average of nine months for single-family and terraced houses.

The weakening of the housing market over the last year cannot be explained by developments in interest rates and incomes. In fact, Danmarks Nationalbank's house-price relation, which seeks to explain the development in house prices on the basis of fundamentals such as interest rate after tax and disposable income, actually shows a slight upward trend, cf. Chart 14.

The house-price relation did not capture price developments during the boom very well. This could indicate that there was an expectation-driven housing bubble in the period 2005-07. It looks as if similar factors – but with the opposite sign – have been at play in the Danish housing market over the last year. Given the current interest-rate conditions, house prices are presumably below their equilibrium level.

A contributory factor could be the structure of housing taxes. Owing to the fall in house prices combined with the decoupling of house prices and property value taxes, the effective property value tax – i.e. tax in relation to the market value of the home – has increased in recent years for the vast majority of homeowners. This is even more pronounced for land tax, for which the annual increase has been capped. As a result, part of the tax on the strong growth in land prices seen during the boom is being phased in now, at a time when prices have fallen. All in all, the structure of housing taxes has contributed to a stronger decline in the prices of owner-occupied housing in the current downturn, while

REAL HOUSE PRICE, ACTUAL AND ESTIMATED Chart 14



Note: The most recent observations are from the 4th quarter of 2011. Danmarks Nationalbank's house-price relation is described in Niels Arne Dam, Tina Saabye Hvolbøl, Erik Haller Pedersen, Peter Birch Sørensen and Susanne Hougaard Thamsborg, Developments in the market for owner-occupied housing in recent years – can house prices be explained?, Danmarks Nationalbank, *Monetary Review,* 1st Quarter 2011, Part 2.
Source: Statistics Denmark and own calculations.

it also amplified price increases in the preceding boom, cf. the articles on developments in the market for owner-occupied housing in recent years in Monetary Review, 1st Quarter 2011, Part 2.

At times the housing market is also driven by self-reinforcing expectations. When house prices are falling, it may be rational to postpone purchases and bring forward sales, which exerts further downward pressure on prices. Conversely, when the market turns, there is an incentive to buy fast and sell later, which pushes up prices further. This makes it difficult to predict when house prices have peaked or bottomed out.

In the forecast, the negative sentiment is expected to squeeze house prices further in the first part of the year, but less so than in the last part of 2011. After that the market will stabilise, with prices rising slightly.

Foreign trade

Exports of goods have been rising slightly in recent months up to January. Compared with the spring of 2011, seasonally adjusted exports, including of industrial goods, have, however, been more or less flat at a level just under the peak immediately before the 2008 financial crisis. The same pattern is seen for imports, and the trade surplus excluding ships and aircraft was stable over the year at around kr. 6 billion per

month, adjusted for the usual seasonal fluctuations. But in January the surplus was a good kr. 8 billion.

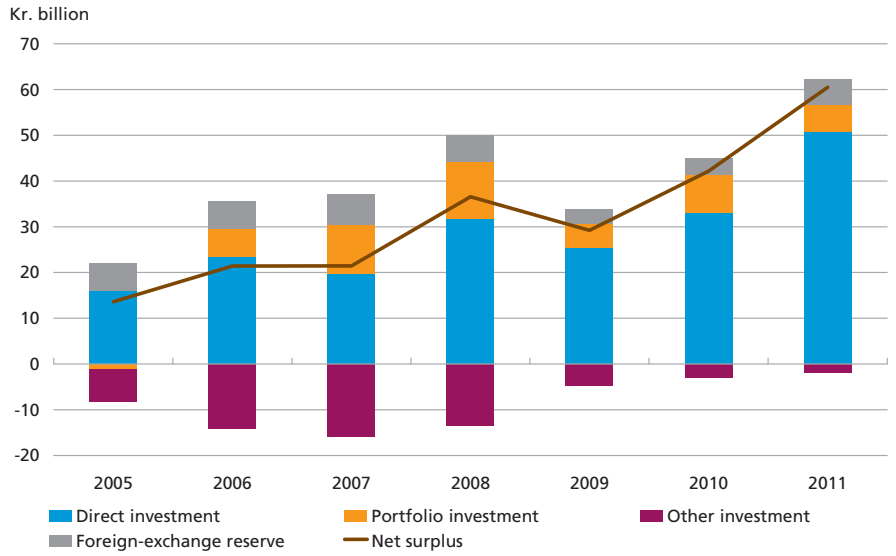
Over the last three months, exports of chemicals and chemical products have increased by more than 6 per cent, mainly reflecting increased sales of pharmaceuticals to China and other countries. Exports of agricultural produce have risen by just over 3 per cent, chiefly on account of increased sales of cereals and pigs.

Export growth in volume terms is expected to be around 2 per cent in 2012. The lower growth rate than in 2011 primarily reflects the expected slow growth in the euro area. On the other hand, the effective exchange rate of the krone has weakened by a couple of per cent since the autumn, owing e.g. to the appreciation of the dollar and the Swedish krona. This improves the competitiveness of Danish firms and mitigates some of the export consequences of the weaker foreign demand.

The current account showed a surplus of kr. 116 billion, corresponding to 6.5 per cent of GDP, in 2011, which was kr. 19 billion higher than in 2010. In January 2012 there was a surplus of kr. 5.9 billion. The surplus for the last 12 months is made up of a surplus on trade in goods and services of kr. 95 billion and wage and investment income that exceeded expenses by kr. 50 billion, while current transfers resulted in a deficit of kr. 30 billion.

Especially the "investment income" surplus has increased in recent years, reaching kr. 60 billion in 2011, which is kr. 18 billion more than in 2010, cf. Chart 15. This is mainly attributable to rising net income from

INVESTMENT INCOME, NET — Chart 15



Note: Preliminary data for 2011.
Source: Danmarks Nationalbank.

direct investment and falling expenses for other investment. The surplus should be viewed in the light of Danish foreign direct investment totalling kr. 1,355 billion at end-2011, while foreign direct investment in Denmark amounted to only kr. 851 billion. This shows that Danish firms have been investing more abroad for a number of years than foreign firms have been investing in Denmark.

Labour market and capacity

According to the national accounts, employment declined by 17,500 persons in 2011, mainly reflecting reductions in the public sector. This year employment is expected to rise a little again, but due to the fall in 2011, the annual levels will be the same. Employment is expected to continue to grow throughout the forecast period.

Unemployment has been more or less flat the last two years, but has fallen a little in recent months. In January 2012, gross unemployment, adjusted for seasonal patterns, was 160,000 persons, corresponding to 6.0 per cent of the labour force. In the projection, unemployment will rise slightly this year and then fall back again in the coming years.

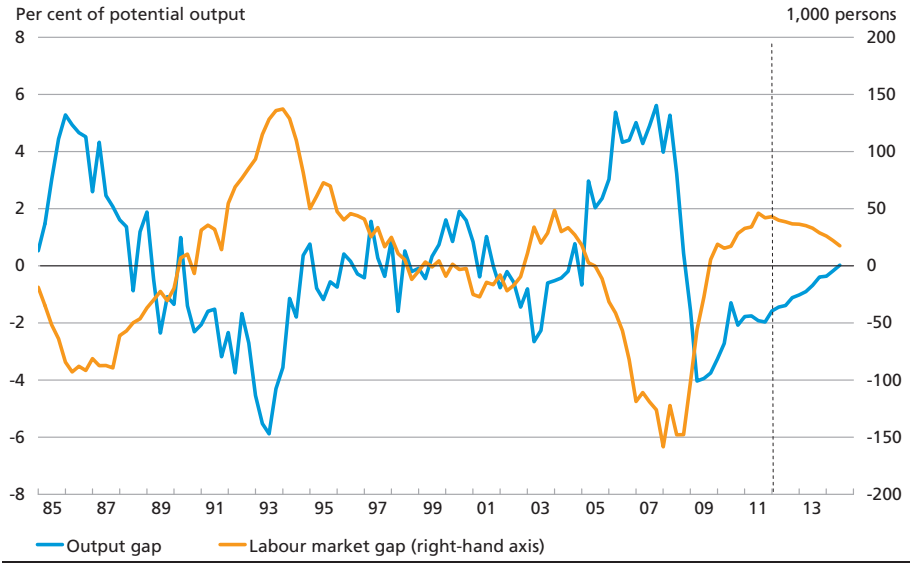
Assessments of capacity pressures in the economy often apply a measure of the output gap. This shows how much actual output deviates from potential output, taken to mean the level of output that the economy can sustain without inflationary pressures arising. The moderate recovery of the Danish economy since 2009 has narrowed the negative output gap, cf. Chart 16. At the current level of activity, the output gap is estimated at -2.0 per cent of potential GDP in the 4th quarter of 2011. The gap is expected gradually to close towards 2014 as economic growth accelerates.

The negative output gap mainly reflects that the labour force is assessed to be below its structural level and that productivity in the private non-agricultural sector has not yet resumed its trend following a dive in 2006-09. On the other hand, unemployment is estimated to be close to a sustainable level. It is remarkable that the most recent downturn has been reflected in a declining labour force rather than rising net unemployment. This is in contrast to the situation in the early 1990s and shows that the labour force has become more cyclical, partly due to a larger proportion of foreign labour.

Wages

In the private sector, wages rose by 1.9 per cent in the 4th quarter of 2011 compared with the same quarter of 2010. This was slightly more than in the 3rd quarter, but low in a long-term perspective. At 2.5 per cent, wage inflation was highest within manufacturing, etc., while it was 1.0 per cent in the building and construction sector.

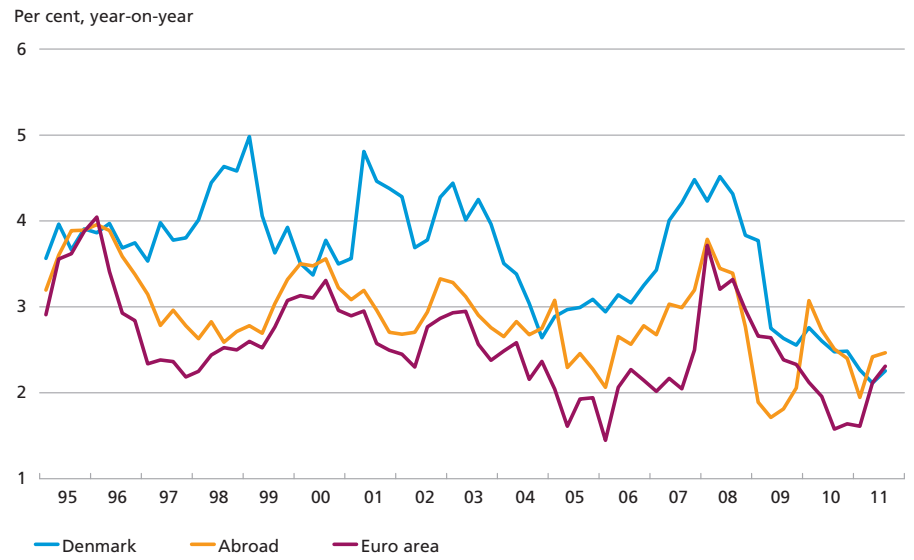
OUTPUT AND LABOUR MARKET GAPS — Chart 16



Note: A positive labour market gap indicates that the total input of labour is below the structural level. The reason may be that unemployment exceeds structural unemployment or that the labour force is below its structural level.
Source: Statistics Denmark and own calculations.

Wage inflation has on average been somewhat higher in the private-sector labour market than for central government employees, whose wages rose by 1.0 per cent in the 4th quarter.

WAGE DEVELOPMENTS IN DENMARK AND ABROAD — Chart 17



Note: "Abroad" and "Euro area" have been calculated using the weights from the real effective exchange rate of the krone.
Source: Statistics Denmark, OECD and own calculations.

In recent quarters Danish wages in the competitive manufacturing sector have risen more slowly than wages abroad, following a long period in which the opposite applied and Denmark lost competitiveness, cf. Chart 17.

The collective agreements for the private-sector labour market, which have not yet been adopted, are in line with the previous agreements and stay within relatively narrow limits, with increases in the range of 1.5 per cent p.a. for the next two years, cf. Box 5. In the minimum-wage area, wage negotiations are decentralised, but if the overall framework is taken as a point of reference, it looks as if Danish wage inflation will match the level abroad in the coming years. Whether this will boost Denmark's competitiveness depends on productivity developments in Denmark relative to other countries. It will

COLLECTIVE AGREEMENTS FOR THE PRIVATE-SECTOR LABOUR MARKET Box 5

In February, agreement was reached on a number of 2-year collective agreements for the private-sector labour market. The agreements comprise, *inter alia*, industry, transport, construction, the commercial and clerical sector and the financial sector. The agreements have not yet been approved by ballots of members.

For industry, the agreement entails a rise in minimum wages of 1.27 per cent from 1 March 2012 and a further 1.26 per cent from 1 March 2013. Other elements include increased opportunity for fully paid training in connection with job sharing, entitlement to wages during sickness after six months' employment (currently nine months) and the option to conclude individual agreements on senior arrangements for up to five years before ordinary retirement age. Under the latter arrangement, employees may work reduced hours and opt to have the current pension contributions paid out in addition to wages. The industrial sector is a "minimum-wage area", where actual wage increases are subsequently negotiated at the individual workplace. This sector traditionally sets the standard for collective agreements in other minimum-wage areas.

In the "normal-wage area", where there is no decentralised wage bargaining, agreements have been reached for, *inter alia*, the transport area, which sets the standard for the normal-wage area. Here wage increases of approximately 1.5 per cent have been agreed on 1 March of both 2012 and 2013. Nuisance bonuses are raised by 1.4 per cent; however, at the same time normal working hours on Saturdays are extended by 1.5 hours from 2014, but with speedier phasing-in in retail trade. As in industry, the right to wages during sickness will be obtained sooner and a senior arrangement with reduced working hours will be introduced. But unlike in industry, it will not be possible to have current pension contributions paid out in addition to wages. Instead, they may be converted into extra holiday entitlement. Other agreements in the normal-wage area resemble the transport agreement closely.

Within the financial sector, wage increases of 1 per cent annually for two years have been agreed, as well as increased opportunities to take time off when children are sick.

take more than a few years to catch up on the considerable loss of competitiveness previously seen.

Prices

The year-on-year increase in the Harmonised Index of Consumer Prices, HICP, was 2.7 per cent in February compared with 2.8 per cent in January, cf. Table 3. At the turn of the year, taxes on beer, wine, soft drinks and sugary foods were raised, and excise duties were indexed to prices. Exclusive of indirect taxes, prices rose by 2.4 per cent in both January and February.

Viewed over the last year, net prices have risen by 7.1 per cent for energy and 3.5 per cent for food. This pushes up HICP inflation. Euro area inflation was 2.7 per cent in both January and February so Danish inflation is once again in line with that of the euro area after having been slightly lower for a few months.

Since the spring, core inflation, which excludes the energy and food components of the consumer price index, has hovered around 1.5 per cent year-on-year. The price index for the domestic supply of goods, wholesale prices, illustrates price developments in the first link of the sales chain, stated exclusive of taxes. Following a period of strong growth, this index was virtually flat in the 2nd half of 2011. Inflation expectations, which are measured by asking about expectations for prices one year ahead relative to current prices, have declined since the autumn, but remain relatively high.

Overall, these factors indicate that there are no strong underlying inflationary pressures in the Danish economy. The collective agreements

CONSUMER PRICES — Table 3

Per cent, year-on-year	Weight[1]	2011	2012	2013	2014	2011-12					
						Q4	Q1	Q2	Feb.	Mar.	Apr.
HICP		2.7	2.5	1.8	1.8	2.6	2.7	2.5	2.7	2.6	2.3
Index of net retail prices	100	2.6	2.3	1.8	1.7	2.3	2.4	2.2	2.4	2.2	2.0
Exogenous:											
Energy	8.5	12.6	6.2	1.4	-0.8	11.1	6.3	7.0	7.1	5.7	5.2
Food	13.6	3.8	2.4	1.6	1.7	3.5	3.3	2.2	3.5	3.0	2.7
Adm. prices	4.6	2.4	2.3	2.7	2.6	2.1	1.9	2.9	2.0	2.0	3.1
Rent	21.8	2.9	2.8	3.0	2.8	3.0	2.7	2.7	2.6	2.6	2.7
Excl. exogenous	51.6	0.5	1.3	1.3	1.5	0.3	1.3	1.1	1.3	1.2	0.9
Imports	14.7	3.9	1.1	2.7	2.5	2.6	1.0	0.2	1.1	0.5	0.1
IMI	36.9	-0.9	1.4	0.7	1.0	-0.6	1.3	1.5	1.4	1.4	1.2

Note: The most recent actual figures are from February 2012.

[1] Weight in the index of net retail prices, per cent.

concluded give reason to hope that the temporarily slightly higher inflation will not be reflected in nominal wages. This will prevent second-round effects and improve the prospect of stable price developments. Against that background, inflation is expected to subside in the coming years, to a level of 1.8 per cent in 2013 and 2014.

Public finances

Fiscal policy is expected to be eased a little this year. The reason is that the expansionary effect of the temporarily higher level of public investment and the option of tax-free disbursement of early retirement contributions in 2012 exceeds the underlying consolidation of public finances.

The forecast estimates real growth in public consumption of 0.9 per cent of GDP in 2012, compared with a decline of 0.7 per cent in 2011. For the next two years, weak positive growth in real public consumption is also expected, while the higher level of public investment falls. Nevertheless, the level of investment at end-2014 will still be higher than the level immediately before the crisis.

For 2012, a government deficit of kr. 93 billion, equivalent to 5.0 per cent of GDP, is expected, compared with an estimated deficit in 2011 of 2.3 per cent of GDP. Of the kr. 51 billion deterioration, kr. 17 billion is attributable to one-off disbursement of early retirement contributions. Add to this a decline in the expected proceeds from pension yield tax. In 2013, the government deficit is expected to fall below 3 per cent of GDP again. Besides lower extraordinary investment, increased economic growth will help to reduce the deficit in the coming years.

Hence Denmark will comply with the recommendation from the Ecofin Council to reduce its deficit to less than 3 per cent of GDP by 2013 at the latest, cf. the requirement of the Stability and Growth Pact.

According to the Ministry of Economic Affairs and the Interior, the cyclically adjusted government budget balance, i.e. the structural balance, will be in balance in 2013. This means that Denmark will also have complied with the recommendation to reduce the structural balance by 1.5 per cent of GDP from 2011 to 2013, and the fiscal rule of the Fiscal Compact will have been observed.

It is difficult to predict the balance of government budgets with any degree of precision, as e.g. income from pension yield tax fluctuates strongly from year to year. At end-2010, pension wealth amounted to more than 140 per cent of GDP. Tax is calculated on the basis of the market-value principle so that tax is paid on capital gains. Consequently, proceeds from this tax are sensitive to developments in the financial markets, particularly interest rates.

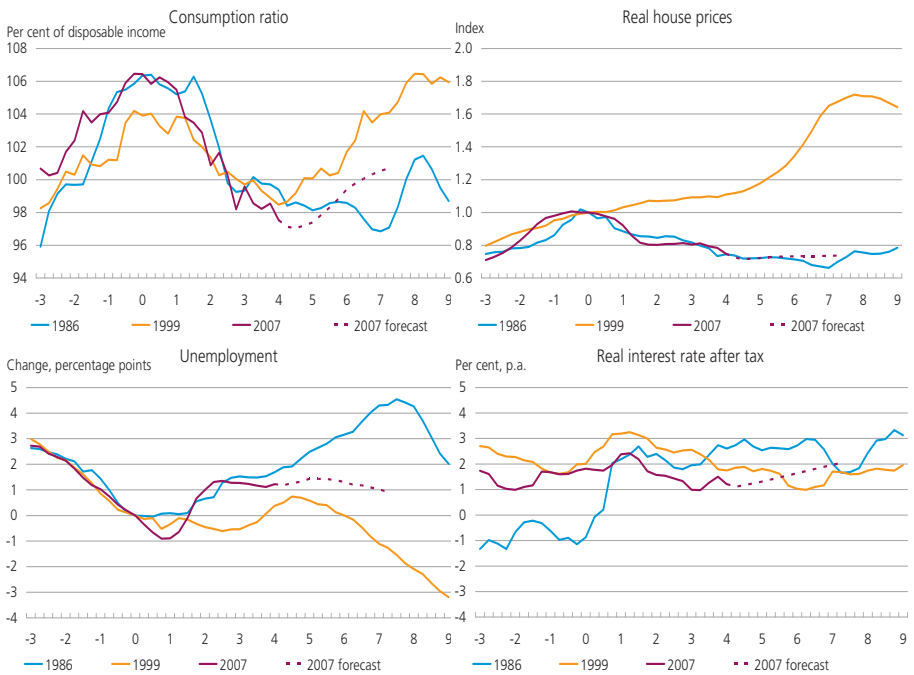
Development in private consumption during three cyclical reversals

It is uncertain when the high propensity to save in the private sector will reverse and the substantial consumption potential will be converted into actual consumption. To investigate whether previous cyclical reversals may help to shed light on this issue, the latest cyclical reversal is compared with those in 1986 and 1999, respectively, cf. Chart 18.

The economic upswing in 2004-06 subsided during 2007. The cyclical reversal hit the housing market first, and prices stagnated after some years of high growth. In the late summer of 2007, the international financial turmoil set in, followed by a cyclical downturn in 2008 and 2009 with steep falls in both private consumption and house prices. At the same time, plummeting world trade meant that exports declined.

In many ways, developments up to the latest cyclical reversal resemble the situation in the first part of the 1980s. In the period 1983-86, a large fall in interest rates following the introduction of the fixed-exchange-rate policy in 1982 caused house prices to soar. This boosted private

HOUSEHOLD CONSUMPTION RATIO, REAL HOUSE PRICES, UNEMPLOYMENT AND REAL INTEREST RATE AFTER TAX — Chart 18



Note: The cyclical reversals dated 0 in the charts have been set at 2nd quarter 1986, 2nd quarter 1999 and 3rd quarter 2007, respectively. The X axis shows the number of years before and after the reversal. The consumption ratio is centred 4-quarter moving averages. Adaptive expectations have been applied for calculation of the deflator in the real interest rate after tax. Developments after the 2007 reversal have been projected based on the most recent forecast – indicated by the broken line.

Source: Statistics Denmark and own calculations.

consumption and led to general overheating of the economy. Another contributory factor was a very high tax value of interest deductibility. Real interest rates after tax were negative, which encouraged loan-financed consumption and low savings. Among other things, this led to a large current-account deficit.

There are several parallels between the reversal in the 1980s and the most recent one. Falling real house prices meant that homeowners' average loan-to-value ratio increased. At the same time, the consumption ratio declined. The resultant fall in economic activity led to higher unemployment with a lag of just over one year. In both cases, the reversal came after an economic upswing rooted in economic policy measures that contributed to lower costs and/or payments for loans, not least for home purchases – in the 1980s the fixed-exchange-rate policy and the resultant decline in interest rates, in the most recent upswing the freeze on property value tax and the introduction of mortgage loans with variable interest rates and deferred amortisation. Furthermore, in both periods the rise in private-sector demand was not curbed by means of suitable fiscal tightening.

However, the economic policy reactions to the overheating have been completely different. In the 1980s, the framework conditions were tightened through austerity measures and limitation of the tax deductibility of interest so that real interest rates after tax increased. The most recent recession was addressed via expansionary fiscal policy while historically low interest rates helped to buoy up the economy.

The reversal in the late 1990s also came after government measures to address the deterioration in the current account. Further limitation of interest deductibility caused real interest rates after tax to rise, but the housing market was almost unaffected by the subsequent somewhat milder downturn. The consumption ratio had not reached the level seen in 1986 and 2007, but nevertheless the decline resembles these two episodes.

While the current downturn would seem to resemble the 1986 episode the most, there are also significant differences. There has not been any large increase in real interest rates after tax, and the Danish economy is more balanced, cf. Table 4. This has provided scope for introducing expansionary measures without jeopardising fiscal credibility. The accumulation of considerable pension savings means that households taken as one have positive net worth despite heavy debt financing in the housing market. Moreover, the last 15 years' structural policy initiatives in the labour market have contributed to reducing structural unemployment and increasing flexibility.

Healthier balances, better structures in the labour market and low real interest rates all mean that it should be possible to restore a normal

DEBT AND HOUSEHOLD NET WORTH DURING THREE ECONOMIC REVERSALS Table 4

Average over the period	1986-89	1999-02	2007-10
Government debt[1], per cent of GDP	44	41	16
Foreign debt, per cent of GDP	46	18	1
Household gross debt, per cent of disposable income	175	204	300
Household net worth[2], per cent of disposable income	240	358	478

Source: Statistics Denmark and Danmarks Nationalbank.

[1] Stated as the nominal value of domestic and foreign debt less the central government's balance at Danmarks Nationalbank and the central government's assets in the Social Pension Fund, the Advanced Technology Foundation and the Preventive Measures Fund.

[2] Stated after tax.

consumption ratio more rapidly in the coming years than was the case in the 1980s, and the labour market is also set to develop more favourably.

The weak development in the housing market in recent years resembles the situation after 1986. Combined with a high loan-to-value ratio and continued tensions in the financial sector, this means that we are hardly likely to see as speedy a recovery as in the years after the 1999 dive. On the other hand, the current borrowing and loan servicing costs are rather favourable at present.

Economic policy

The European sovereign debt crisis has clearly demonstrated the importance of sound fiscal policies. At the meeting of the European Council on 1 and 2 March, a Fiscal Compact was adopted which will take effect on 1 January 2013. The rules of the Compact are to be incorporated into national legislation. The Danish government has indicated that this will be done by way of the budget act that had already been planned.

As regards the background to the budget act, experience from management of public finances shows that there have been repeated budget overruns in the last few decades. Particularly local authorities have found it hard to observe the limits laid down. This situation has improved in recent years thanks to new management instruments and sanctions. The introduction of a budget act is a further step in that direction. The act will lay down multi-year frameworks for financial management by central, regional and local government and specify the action to be taken in the event of overruns. Under the future fiscal policy regime, with tighter monitoring of economic policy the by the EU, and in view of the financial markets' increased focus on public finances, there will be little scope for deviation from the budgets laid.

Like the banking sectors of many other countries, the Danish banking sector was affected by the international financial crisis starting in the autumn of 2008. Bank funding became harder to get by, and as losses mounted the risk of a general credit crunch emerged.

To address these issues, five Danish bank rescue packages have been adopted in the period 2008-12. While the first one concerned an unlimited guarantee for the sector overall, the measures have gradually become more targeted. The bank rescue packages have contributed to improving conditions in the sector notably. Recently several banks have procured liquidity again, also in the international financial markets. Solvency ratios have increased and the quality of the banks' base capital is better than before the crisis. At the same time, the large customer funding gaps previously seen have been reduced substantially. All in all, this increases the robustness of the banking sector. Moreover, a framework has been created for handling distressed banks, including through mergers and acquisitions within the sector with the assistance of the Financial Stability Company, and most recently through the political agreement to establish an institution for funding the agricultural sector. There may still be a few incidents where banks run into problems, but the issue has been reduced to a size that is manageable within the current framework.

The statutory and regulatory frameworks have contributed to a more robust financial sector. At the same time, the low level of interest rates is helping the market. Moreover, like a number of other central banks, Danmarks Nationalbank has since 2008 taken various steps to support bank liquidity.

With the expected growth in the economy and the considerable consumption potential as a result of the low consumption ratio, the continued consolidation of public finances and reduction of public investment in 2013 to a more normal level may be well timed in a cyclical perspective. These steps are also necessary in order to comply with the Ecofin Council's recommendation under the excessive deficit procedure.

Under the present framework conditions, the housing market is characterised by self-reinforcing fluctuations which have taken a downward path in recent years. It is impossible to predict when the housing market will turn, but when it does, the upswing is also likely to be self-reinforcing. This will not necessarily cause problems in the first few years, but combined with a substantial potential for higher private consumption and investment, this supports the need for vigilance in terms of financial conditions and economic policy.

The options for managing economic growth in detail via active fiscal policy are, in practice, limited, and fiscal policy is most appropriately based on a medium-term perspective. In this respect, it is necessary to update the 2020 plan prepared in the spring of 2011. Since its publication, a retirement reform and unemployment benefit reform have been introduced, a number of transfer payments have been raised and, most

recently, a social pension reform has been proposed. The government's ambition to increase the supply of labour by 135,000 people by 2020 must be assessed to be beyond the scope of the reforms implemented so far. Consequently, it is important to continue along the planned path of reform.

APPENDIX 1: ASSUMPTIONS IN THE FORECAST FOR THE DANISH ECONOMY

The forecast has been produced using the macroeconometric model MONA[1] and is based on available economic statistics, including Statistics Denmark's preliminary quarterly national accounts for the 4th quarter of 2011.

The projection is based on a number of assumptions concerning the international economy, financial conditions and fiscal policy.

The international economy

The international organisations expect subdued growth in global activity. This assessment also applies to Denmark's most important trading partners. Against that background, the market for Danish exports is assumed to grow by 3.4 per cent in 2012, after which the rate of growth is expected to increase to just under 7 per cent in 2014, cf. Table 5.

On account of the weak growth outlook, the increase in foreign prices is expected to be modest this year, rising to just under 2 per cent in 2014. The same applies to price developments in the export market. Wage inflation abroad is estimated to be modest throughout the projection period due to weak labour markets in most countries.

Interest rates, exchange rates and oil prices

Developments in short-term and long-term interest rates in the forecast are based on the expectations of future developments that can be derived from the yield curves in the financial markets. Short-term Danish interest rates are expected to mirror money-market interest rates in the euro area. At the beginning of March 2012, the 3-month money-market interest rate, measured by the CITA swap rate, was 0.3 per cent, which is a little lower than at the time of preparation of the previous forecast. The short-term money-market interest rate is expected to rise slightly, to 0.5 per cent in 2014.

The average bond yield is defined as an average of the yields to maturity on outstanding government and mortgage bonds. The average bond yield was 2.4 per cent in early March and is expected to rise to 3.4 per cent during the projection period.

The effective exchange rate of the krone has weakened in recent months. The reason is that the euro, and hence also the Danish krone, has generally weakened vis-à-vis a number of currencies. In the projec-

[1] The model is described in Danmarks Nationalbank, *MONA – a quarterly model of the Danish economy*, 2003.

OVERVIEW OF FORECAST ASSUMPTIONS Table 5

	2011	2012	2013	2014
International economy:				
Export market growth, per cent year-on-year	6.1	3.4	5.9	6.9
Export market price[1], per cent year-on-year	1.9	0.5	1.7	1.8
Foreign price[2], per cent year-on-year	2.1	0.6	1.8	1.8
Foreign hourly wages, per cent year-on-year	2.3	2.3	2.5	2.8
Financial conditions, etc.:				
3-month money-market interest rate, per cent p.a.	0.9	0.3	0.3	0.5
Average bond yield, per cent p.a.	2.7	2.5	2.9	3.4
Effective krone rate, 1980 = 100	103.6	101.7	101.7	101.7
Dollar exchange rate, DKK per USD	5.4	5.6	5.6	5.6
Oil price, Brent, USD per barrel	110.8	119.8	113.5	105.0
Fiscal policy:				
Public consumption, per cent year-on-year	-0.7	0.9	0.5	0.4
Public investment, per cent year-on-year	9.5	10.6	-19.9	0.7
Public-sector employment, 1,000 persons	828	829	834	837

[1] Weighted import price for all countries to which Denmark exports.
[2] Weighted export price for all countries from which Denmark imports.

tion, the dollar rate and the effective krone rate are assumed to remain constant at the level from early March.

At the time of forecasting, the price of oil was around 125 dollars per barrel. In the projection, oil prices are assumed to develop in line with futures prices, falling to just under 105 dollars per barrel by 2014.

Fiscal assumptions

The fiscal assumptions in the forecast are based on the announced fiscal-policy measures, including the Finance Act for 2012. Real public consumption is assumed to rise by 0.9 per cent this year, following a fall of 0.7 per cent in 2011. The figures for 2013 and 2014 are expected to be 0.5 per cent and 0.4 per cent, respectively. Public investment is expected to rise by a good 10 per cent this year, but then to be reduced over the next few years as the temporary increase in the level of investment is phased out.

APPENDIX 2: REVISIONS IN RELATION TO THE PREVIOUS FORECAST

The estimated growth in GDP in 2012 has been adjusted marginally upwards, while the 2011 and 2013 figures remain unchanged relative to the December forecast, cf. Table 6, which shows a breakdown of the revisions to GDP and consumer prices by key factors.

The almost unchanged growth estimates for 2012-13 mask several opposite changes in the basis for the forecast. Export market growth has been adjusted downwards, which points to lower GDP growth; this is more or less offset by the weakening of the effective krone rate since the December forecast. The labour market outlook is also brighter now than assumed in December. This supports slightly stronger domestic demand than estimated in December, which explains the contribution to higher GDP growth under the "other factors" item. On the other hand, the projection operates with higher oil prices now than in December, which will reduce growth in 2012 and 2013.

Consumer price inflation has been revised upwards in 2012 and 2013. The upward adjustment of the oil price in the forecast period pushes up price inflation, while the weaker effective exchange rate of the krone makes imported goods more expensive.

REVISIONS IN RELATION TO PREVIOUS FORECAST Table 6

	GDP			Consumer prices, HICP		
Per cent, year-on-year	2011	2012	2013	2011	2012	2013
Forecast, December 2011	1.0	1.1	1.6	2.7	2.2	1.7
Contribution to revised estimate from:						
Export market growth	-0.1	-0.2	-0.1	0.0	0.0	0.0
Interest rates	0.0	0.0	0.0	0.0	0.0	0.0
Exchange rates	0.0	0.2	0.2	0.0	0.1	0.1
Oil prices	0.0	-0.1	-0.1	0.0	0.2	0.1
Other factors	0.1	0.2	-0.1	0.0	0.0	0.0
This forecast	1.0	1.2	1.6	2.7	2.5	1.8

Note: The transition from the previous to this forecast may not add up due to rounding. "Other factors" includes data revisions.

Productivity Growth in Denmark – Summary

Asger Lau Andersen and Morten Spange, Economics

INTRODUCTION

Productivity refers to the efficiency of a production process. In simplified terms, the concept reflects value added generated by the production process relative to the amount of input. For example, *hourly productivity*, which is one of the most frequently used measures of productivity, is an expression of the average output per hour worked.

An increase in hourly productivity implies more output for a given input of labour. Accordingly, higher hourly productivity enables a higher level of economic welfare and higher standards of living at the national level. Higher economic welfare can also be achieved by other means, e.g. by improving the terms of trade or by raising the average number of hours worked per person. In the longer term, however, the scope for raising the number of hours worked per person is limited, and it is not realistic to assume that the terms of trade can be improved indefinitely. Sustained improvements in welfare require sustained productivity growth.

Productivity growth has been weak in recent years, however – not only in Denmark, but also in most other western countries. But the decline in productivity growth has been particularly pronounced in Denmark, which has seen weaker productivity growth than its neighbouring countries since the mid-1990s.

In September 2011, Danmarks Nationalbank and the International Monetary Fund, IMF, held a conference on Danish productivity growth viewed in an international perspective. In Part 2 of this Monetary Review we present and extend the insights obtained at the conference. This article summarises the most important points and conclusions.

It is difficult to pinpoint the exact reason why, since the mid-1990s, Denmark has seen weaker productivity growth than most of its neighbouring countries. In terms of structural parameters that are normally considered to be of importance to productivity and growth – such as accumulation of capital, education, research and development and labour-market flexibility – Denmark is in a good position relative to other advanced economies.

Consequently, it is more natural to focus on what it would take to improve productivity growth in Denmark in future. But productivity can be influenced by many different factors, and this article does not leave scope to treat all the relevant ones. We have therefore chosen to focus on the topics discussed at the conference held by Danmarks Nationalbank and the IMF. Based on the conference as well as the existing economic literature, we argue that increased competition and openness to other countries may be means of improving productivity in Denmark, especially in the service sector. In terms of the education sector, added emphasis on specific disciplines, especially in the social and natural sciences, may contribute to higher productivity. Another contributing factor could be restructuring of the tax system.

Finally, it is important to focus on the mobility and flexibility in the Danish economy. Much of the aggregate productivity growth may thus be attributed to the free mobility of economic resources, including labour, towards activities with high value added. It is therefore important to avoid measures retaining an undue amount of resources in less productive activities. A case in point is the construction sector, which grew excessively during the overheating of the Danish economy in the years prior to the financial crisis.

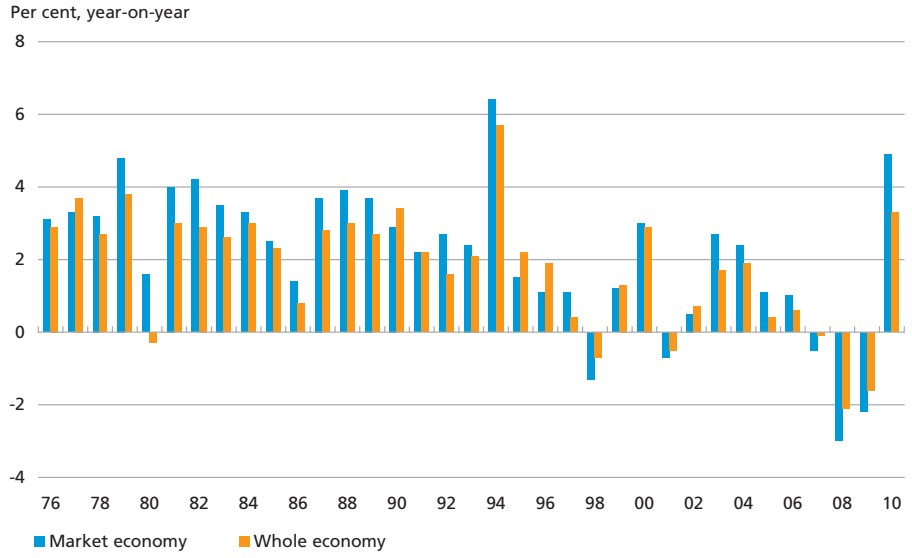
GROWTH IN DANISH PRODUCTIVITY 1975-2010

Output per hour worked in the Danish economy, measured by the gross domestic product, GDP, at factor cost, nearly doubled in the period 1975-2010, equivalent to an average annual growth rate of 1.8 per cent for the period as a whole. However, this figure covers both the private and public sectors taken as one. This is problematic, since value added in the public sector is measured on a cost basis in the national accounts. Accordingly, productivity growth in the public sector is not taken into account. If, instead, the market economy is considered, the average annual growth rate for output per hour worked was 2.1 per cent in the period 1975-2010.[1]

Hourly productivity fluctuates strongly from year to year, however, cf. Chart 1. For example, productivity fell markedly in both 2008 and 2009, but rose substantially in 2010. These annual fluctuations should be viewed against the backdrop of the cyclical position. Output tends to fall at the beginning of a downturn, because firms' production falls, whereas employment typically reacts with a certain lag. Firms will gradually adjust their demand for labour to the new conditions, so productivity rises.

[1] There are also significant challenges in measuring productivity in the market economy. They are described in more detail in our article in Part 2 of this Monetary Review.

ANNUAL GROWTH IN HOURLY PRODUCTIVITY, 1975-2010 Chart 1



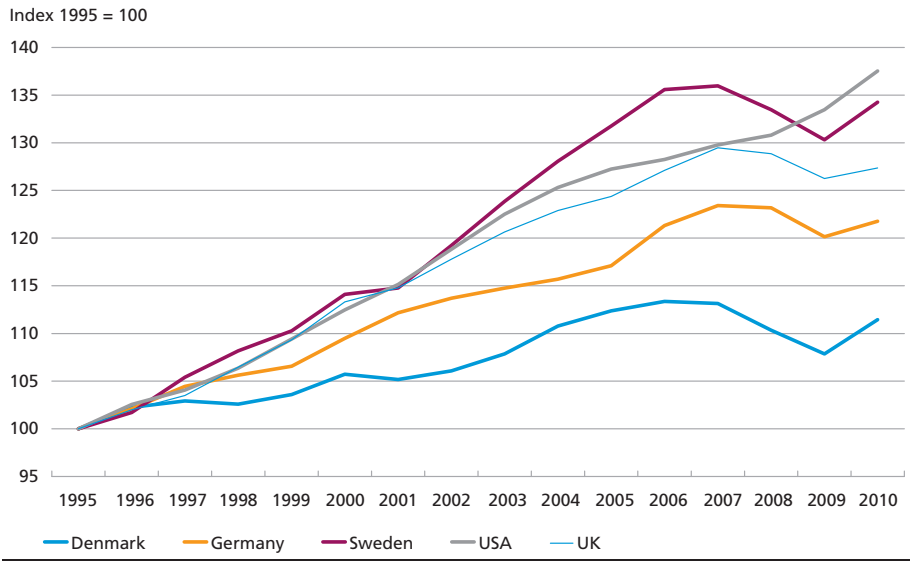
Note: The Chart shows the annual growth rates of GDP at factor cost per hour worked, 2005-prices, chained values. Market economy refers to the economy as a whole, excluding the general government sector.
Source: Statistics Denmark.

The evolution of productivity is also characterised by movements that are not directly attributable to the economic cycle. In the years 1975-95 average annual growth in hourly productivity in the market based economy was 3.2 per cent, while the figure was only 0.7 per cent in the years 1995-2010. Thus, productivity growth has been considerably lower since the mid-1990s than in the previous decades.

A comparison with productivity growth in some of our neighbouring countries shows a similar picture of weak Danish performance in recent years. Since 1995, labour productivity in Denmark, measured by GDP per hour worked, has increased by 11 per cent in total, cf. Chart 2. During the same period, productivity in Germany has risen by 22 per cent, while Sweden and the USA have seen productivity growth of 34 and 38 per cent, respectively. The same overall pattern is seen when choosing another starting year, e.g. 1990.

In summary, productivity growth in Denmark has been weak since the mid-1990s, compared to both the preceding years and to a number of comparable countries. After many years of catching up with the USA, Denmark, like virtually all other Western European countries, has seen a widening of the gap between its productivity level and that of the USA. The slowdown in productivity growth has been particularly pronounced in Denmark, however, where growth in GDP per hour worked since 1995

GDP PER HOUR WORKED, ECONOMY AS A WHOLE, 1995-2010 Chart 2



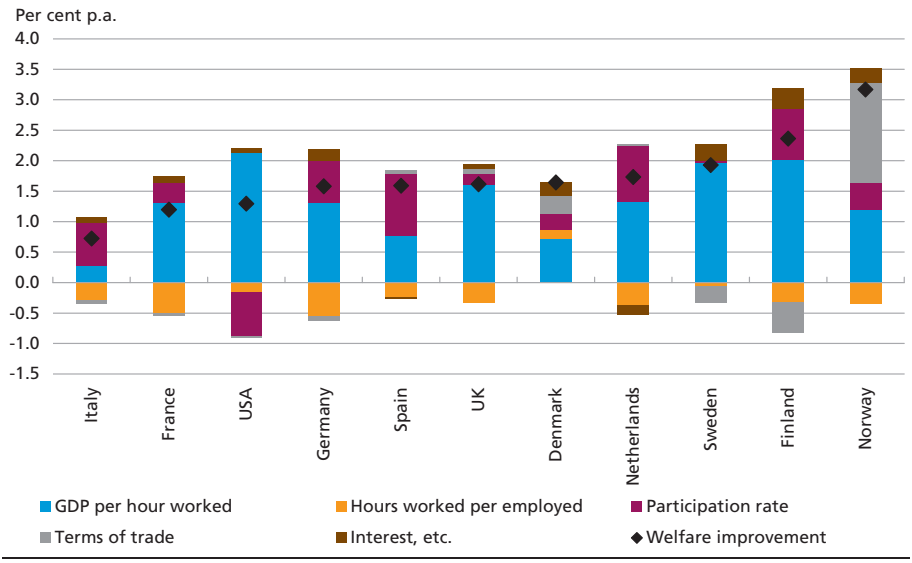
Source: OECD.

has been weaker than in other countries with the same initial level of income.

The weak Danish productivity growth has attracted considerable political focus. Productivity growth was thus one of the key focus areas for both the Globalisation Council and the Danish Growth Forum, which were established by the government at the time in 2005 and 2009, respectively. In the Danish Government Platform of 2011, the new government states that it will set up a productivity commission with the mandate to identify the causes of the low productivity growth and on this basis make specific recommendations to enhance productivity, cf. Danish Government (2011).

Productivity is not the only factor that impacts the level of economic welfare in Denmark. As initially mentioned, the number of hours worked per person, the terms of trade and income from abroad are also of key importance. The weak growth of productivity since the mid-1990s has coincided with a marked improvement of the terms of trade, an increase in the number of hours worked per employed and higher interest and investment income from abroad. Taking these factors into account, the improvement in economic welfare in Denmark since the mid-1990s appears less weak in an international context than implied by the growth of productivity. Adjusted for terms of trade effects, the average annual growth rate in the gross national product, GNP, per person in Denmark is thus on a par with the equivalent growth rates in

ECONOMIC WELFARE, AVERAGE ANNUAL INCREASE 1995-2010 Chart 3



Note: The growth rate of economic welfare has been calculated as the average annual growth rate for GNP per person of working age, adjusted for terms-of-trade effects. For a more detailed account of the adjustments made for terms of trade, see Ølgaard (2006).
Source: OECD, Eurostat, IMF and own calculations.

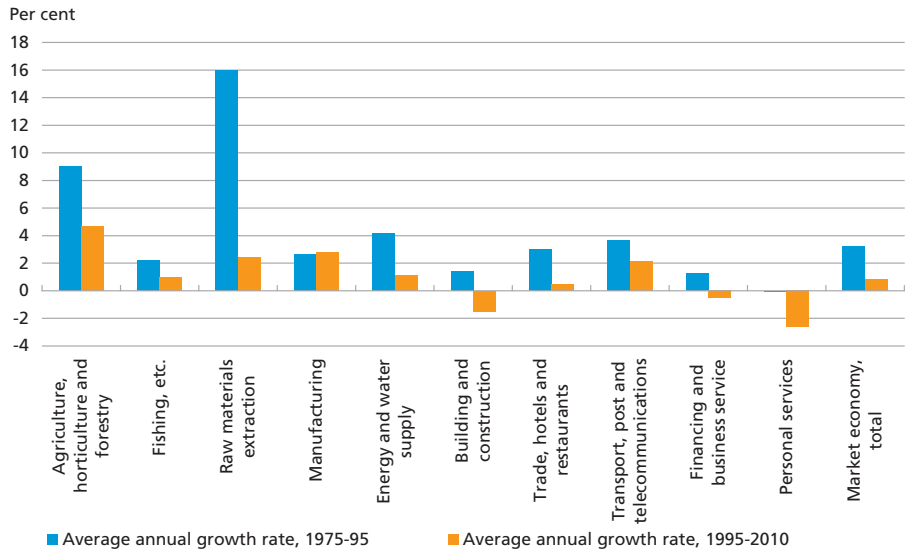
countries such as Germany, Spain, the UK and the Netherlands, cf. Chart 3.[1] Sweden, Finland and Norway are at a somewhat higher level. For Sweden and Finland, this is a consequence of choosing 1995 as the starting year. If 1990 is chosen as the starting year instead, Denmark is at the same level as both Sweden and Finland, while Norway remains higher.

However, it is not likely that improvements of the terms of trade and higher income from abroad will be able to compensate fully for continued weak productivity growth in the future. If productivity growth in Denmark remains lower than in its neighbouring countries, this will cause the level of economic welfare in Denmark to drop relative to those countries.

Declining productivity growth has affected almost all industries in the Danish economy, cf. Chart 4. Only in manufacturing was productivity growth in the years 1995-2010 the same as in the preceding 20 years. Construction and the service sector, on the other hand, have seen a marked fall in growth. Particularly the service sector has played a key role in aggregate productivity growth. The weaker productivity growth

[1] The relationship between weak productivity growth and improved terms of trade is not necessarily a coincidence. In export statistics, it may be difficult to determine the extent to which a higher product price of an export article reflects a quality improvement (and thus higher real value added) or a higher price level. In the former case, the quality improvement will be registered as an increase in productivity, while it will be registered as a terms-of-trade improvement in the latter case.

GROWTH IN LABOUR PRODUCTIVITY BY INDUSTRY, 1975-2010 Chart 4



Note: The Chart shows the average annual growth rates for GVA per hour worked, 2000-prices, chained values. The calculations are based on the market economy, i.e. the economy as a whole, excluding the general government sector. Comparisons of productivity growth across industries are complicated by the fact that it may be harder to measure productivity development in some industries than in others. In some industries, for example, it may be difficult to take the effect of quality improvements into account. Higher product quality makes it possible to sell the product at a higher price. In output statistics it may be difficult to determine whether such increases should be treated as increases in real value creation, and thus in productivity, or in the price level. These difficulties are probably substantial in the service and construction sectors, whereas output in volume terms is easier to calculate in, say, the agricultural sector.

Source: Statistics Denmark and own calculations.

in the service sector can thus explain almost half of the drop in productivity growth in the Danish economy relative to 1975-95. The growth of productivity in the Danish service sector since the mid-1990s also appears to be relatively weak compared with other countries, especially the USA.

CAN DENMARK'S WEAK PRODUCTIVITY GROWTH BE EXPLAINED?

Capital accumulation is a key source of growth in hourly productivity, as increased use of capital equipment, such as machinery and buildings, enables higher output per hour worked. Lower capital accumulation will thus, all else equal, result in weaker productivity growth. Calculations based on figures from Statistics Denmark show that this can explain part of the decline in productivity growth in the period since 1995 relative to the years 1975-95. However, most of this decline is attributable to lower growth in total factor productivity, TFP, which is an overall expression of how efficiently production factors are used in the production process. A comparison of the experience since 1995 with that of other countries

shows a similar pattern. The relatively low Danish productivity growth in this period should thus be attributed to weak TFP growth, while capital accumulation has not been slower than in our neighbouring countries.

Investment in research and development is often highlighted as a key source of productivity growth. Research and development leads to the generation of new knowledge that may enhance both labour and capital productivity. In 2009, Danish firms' total expenditure for research and development constituted 2.08 per cent of GDP, cf. Table 1. This is considerably more than in the euro area. But there are pronounced differences within the group of euro area member states, and the research expenditure of firms in Germany is almost similar to that of Danish firms. When including research conducted in the education sector and the rest of the economy, Denmark's expenditure, at 3.06 per cent of GDP, is also substantially higher than that of the euro area. So there are no indications that investment in accumulation of knowledge is lower in Denmark than in comparable countries.

A third important source of productivity growth is the population's level of education. In terms of the proportion of the population of working age with higher education, Denmark is in line with most comparable countries. Among employed persons, the proportion with higher education has been showing a rising trend over many years, while the proportion with basic general education only has been decreasing, cf. Chart 5. Overall, this does not give grounds for concluding that developments in education levels in Denmark can account for the weak productivity growth.

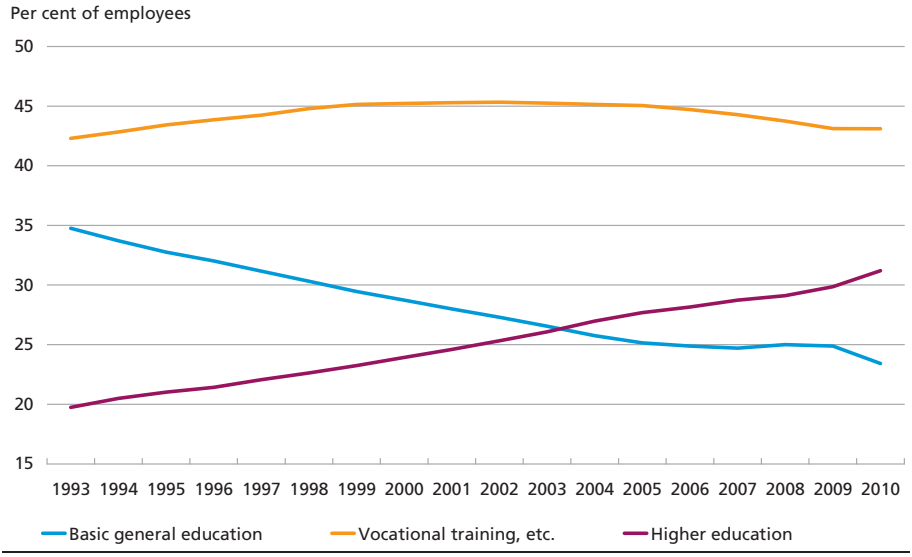
Calculations made by the European Commission, however, indicate that the contribution to productivity growth from improvement of the education level of employed persons has decreased considerably since the mid-1990s, cf. McMorrow (2011). The reason may be the marked reduction in unemployment during the same period. The decline in

EXPENDITURE FOR RESEARCH AND DEVELOPMENT AS A PERCENTAGE OF GDP, 2009 Table 1

Unit	Private firms	Private non-profit sector	Education sector	Other public sector	Total
Denmark	2.08	0.01	0.90	0.06	3.06
France	1.39	0.03	0.47	0.37	2.26
Norway	0.93	-	0.58	0.29	1.80
Sweden	2.54	0.00	0.91	0.16	3.61
Germany	1.91	-	0.50	0.42	2.82
UK	1.12	0.05	0.52	0.17	1.86
USA	2.02	0.11	0.36	0.30	2.79
Euro area	1.27	0.02	0.47	0.29	2.06

Note: The figure for other public-sector expenditure for research in the USA does not include military research. The figures for the USA relate to 2008.
Source: Eurostat.

EDUCATIONAL COMPOSITION AMONG EMPLOYEES Chart 5



Source: Statistics Denmark.

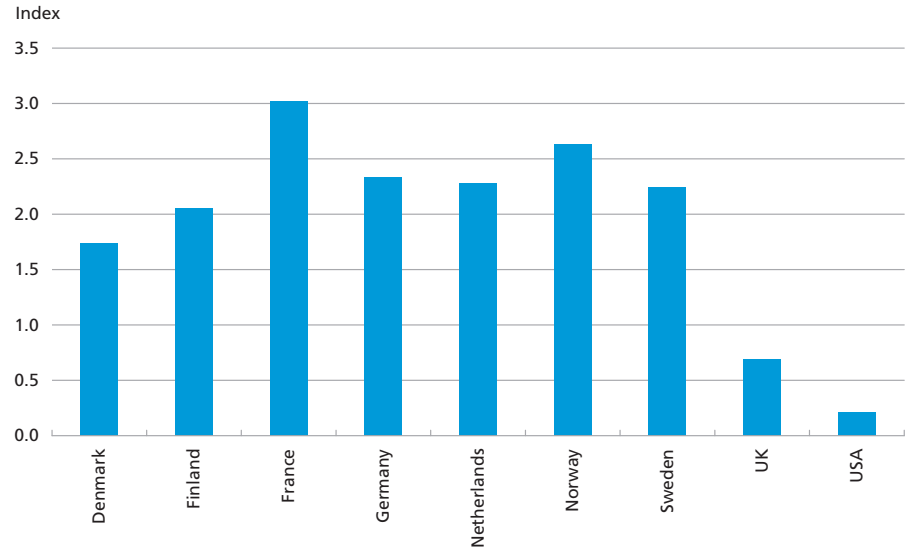
unemployment has thus helped groups of people with relatively little education to gain a stronger foothold in the labour market. This trend was clearly reinforced during the boom in the middle of the last decade. Due to the shortage of labour in those years, the proportion of employed persons with only basic general education began to flatten out after having been falling for many years. This may have contributed to lower productivity growth in those years.

It should be emphasised, however, that a decrease in productivity due to the inclusion of broader groups of employees in the labour market is not a problem in itself. On the contrary, the increase in employment will lead to considerable economic benefits. But it is important to focus on whether the qualifications of the less productive part of the labour force can be upgraded to become more in line with those of other employed persons.

A fourth factor which is often highlighted as important to productivity is the structure of the labour market. Based on a study of the labour markets of the OECD countries, Bassanini et al. (2008) find that rules protecting employees against dismissal have a negative impact on productivity growth. The reason may be that such rules impede the firms' adjustment of labour to the current need, whereby the labour force is retained in less productive activities.

The Danish labour market is characterised by a relatively low degree of protection against dismissal, cf. Chart 6. This is due to the flexicurity model, which combines flexible rules of hiring and firing with relatively

PROTECTION AGAINST DISMISSAL, AVERAGE 1990-2008 Chart 6



Note: The scale runs from 0 (lowest protection) to 6 (highest protection).
Source: OECD.

generous unemployment benefits and active labour-market policies. The flexibility element of the model makes it easier for labour to move towards the more productive firms and industries for the benefit of aggregate productivity. Conversely, flexibility can also lead to too frequent job changes, reducing the incentive to develop skills that are specific to the employee's current job. But the empirical results mentioned above indicate that the positive effects of the flexicurity model outweigh the negative ones, so there is no basis for concluding that the structure of the Danish labour market is behind the relatively weak productivity growth.

Finally, productivity growth in the economy as a whole may also be dependent on the corporate structure in terms of firm size. For example, large firms stand to gain more from research and development and thus to obtain higher productivity growth. There are no indications, however, that the corporate structure is a key explanatory factor behind Denmark's weak productivity growth. Overall, in terms of firm size, Denmark's corporate structure is comparable with that of the other European countries.

HOW CAN PRODUCTIVITY GROWTH BE IMPROVED IN THE FUTURE?

On the basis of the factors often mentioned in connection with productivity, it follows that it is difficult to explain why the decline in

productivity growth since the mid-1990 has been stronger in Denmark than in its neighbouring countries. In the remainder of this article we will therefore focus on factors that can contribute to improving productivity growth in future – whether or not these factors have played a decisive role in the relatively weak Danish productivity growth in the last 15 years.

Research, development and education

As illustrated in the previous section, Denmark is in a good position in international comparisons of investment in education and research and development. The question is, however, whether the resources spent on these activities are appropriately prioritised. McMorrow (2011) argues that Denmark has had a low return on its investment in research and development compared with other countries. This implies that simply expanding the research effort is not necessarily the answer to the productivity challenge, and there may be reason to look into whether the resources dedicated to research are allocated optimally. There may also be reason to examine whether Danish firms benefit sufficiently from knowledge generated outside Denmark. New knowledge and technology can spread to other countries especially via international trade and direct investment. These topics are discussed in more detail in the following section.

A similar point can be made for education. Junge and Skaksen (2010) find that the productivity gain from increased education levels is much more pronounced for social and natural science education than for humanities education in the manufacturing and service sectors alike. Accordingly, giving higher priority to social and natural science programmes will potentially help to boost productivity.

Taxation

The structure of the tax system may also influence productivity. In Denmark, the corporate income tax rate has gradually been lowered from 50 per cent in 1989 to 25 per cent today and is currently in line with those of a number of European countries. On the other hand, Denmark's personal income tax rates are at the high end internationally. Furthermore, the top marginal tax rate is applies to incomes that are only slightly above the average. In countries such as Germany, the UK and the USA, on the other hand, the top marginal tax rate sets in at income levels four to nine times higher than the average income.

Based on data for 21 OECD countries in the period 1971-2004, Arnold et al. (2011) find that both personal and corporate income taxes have a dampening effect on productivity growth. One explanation may be that

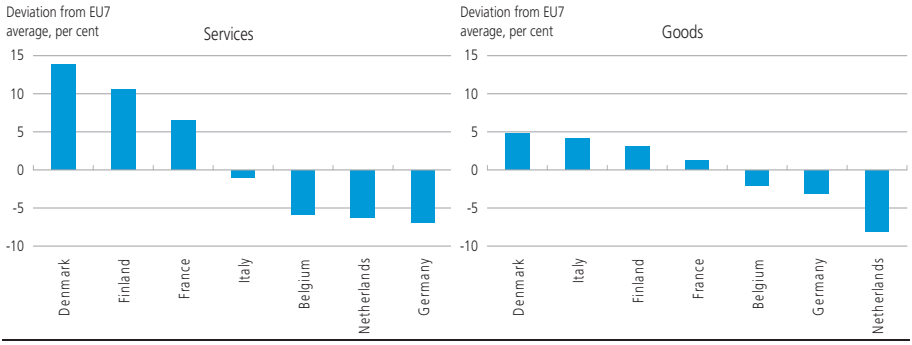
higher taxes reduce the return on productivity-enhancing investments. According to the authors, property taxation, on the other hand, has a much lower negative impact on productivity growth. Higher property taxation may lead to residential investment being channelled into more productivity-enhancing activities. The authors thus argue that a revenue-neutral tax reform that reduces income tax and raises property taxes will have a positive effect on productivity growth and economic growth in general.

Competition and business structure

As a result of both productivity improvements in individual firms and the fact that the most productive firms grow at the expense of the least productive firms, increased competition between firms may contribute to higher productivity. There are some indications of weak competition in parts of the Danish economy. This manifests itself in the price level, which is substantially higher than in other EU member states, especially for services, cf. Chart 7.

Denmark's relatively weak competition may be attributable, among other factors, to anti-competitive regulation in certain sectors. Cases in point are the construction and retail sectors, which are troubled by weak competition, cf. Gaard (2011) and McKinsey & Company (2010). Both sectors are characterised by weak productivity growth and considerable regulation, impeding competition from foreign firms. Deregulation may contribute to improved productivity growth. In terms of the Danish construction sector, its organisation with many small skilled-trade firms

PRICE DIFFERENTIALS IN EU7 MEMBER STATES, 2009 Chart 7



Note: The Chart shows Eurostat's Purchasing Power Parities less VAT and product-specific duties. Adjustment has also been made for differences in the countries' economic wealth. As far as goods are concerned, it cannot be ruled out that Eurostat's calculation of the price level in Denmark is slightly overestimated, the reason being that short-term sales are much more common in Denmark than in other countries. Without sufficient adjustment for such sales, the calculated price level will exceed the actual level. But the problem is probably less pronounced for services where short-term sales are less common.

Source: Danish Competition and Consumer Authority (2011)

may have a negative impact on productivity because of the inability to exploit economies of scale.

Weak competition can also be attributed to insufficient enforcement of competitive legislation. In recent years, the competition authorities in Denmark have been given better tools for efficient enforcement, but according to Gersing (2010) considerable enforcement challenges remain, especially as regards cartel cases. Measures to strengthen enforcement of existing legislation may potentially lead to improved competition and thus higher productivity growth.

A special aspect of competition and business structure concerns the conditions for establishing new firms. Ongoing work from the Danish Economic Councils suggests that new entrepreneurs had a negative impact on Danish productivity growth in the period 2002-07. This may be due to cyclical developments in those years. During an upswing, a number of relatively low-productivity firms may be established which are not viable in a cyclical downturn. This will have a negative impact on aggregate productivity.

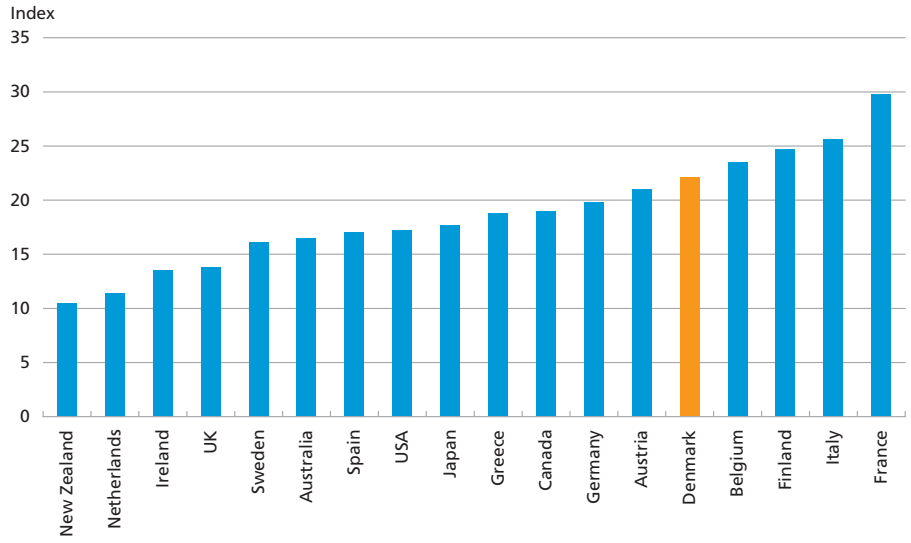
International trade

Another path to higher productivity may be increased openness to international trade. Import opportunities will expose Danish firms to more intensive competition from foreign firms, which may boost productivity in the industries involved. There is probably a particularly large potential for higher productivity growth through this channel in a large number of services, where the extent of international trade is lower than in other sectors. There may be several reasons for the relatively modest extent of international trade in the service sector, but in particular, for many types of services international trade requires one of the trade partners to cross the border.

However, legislative restrictions may also constitute a barrier to international trade in services, e.g. by way of a regulated number of providers in a particular sector, or requirements for national certification of providers. The extent of such restrictions is very difficult to quantify, but, according to international organisations such as the OECD and the World Bank, Denmark is at the more restrictive end of the group of advanced economies, cf. Chart 8 and Francois and Hoekman (2010). This gives reason to take a closer look at the possibilities of deregulating or liberalising the service sector in order to expand the scope for trade with foreign firms.

Increased international trade may also boost productivity in the service sector via the export side. Calculations based on Danish corporate data indicate that exporters of services are more productive than non-ex-

RESTRICTIONS ON INTERNATIONAL TRADE IN SERVICES, 2005 Chart 8



Note: The Chart shows the World Bank's index of political restrictions on international trade in services. A higher value of the index indicates a more restrictive policy. The index is based on publicly available data on policies and covers the financial sector, telecommunications, retail trade, shipping, aviation (passenger transport) and business service.
Source: Borchert et al. (2011).

porters, cf. Skaksen (2011). The probable reason is that the firms that already have the highest productivity become exporters, while the very act of exporting does not necessarily boost productivity. But the calculations also show that access to foreign markets causes productive exporters to grow faster than other – less productive – firms. This indicates that increased trade in services will be able to raise aggregate productivity in the service sector via reallocation of resources from the least productive to the most productive firms. Borchsenius et al. (2010) calculate the potential for international trade in a number of service sectors and assess that the greatest untapped potential is found in subsectors of e.g. transport, advisory services, IT services and research and development.

Foreign direct investment

Economic interaction with other countries may also take the form of inward and outward direct investment. Foreign direct investment leads to ownership and influence in foreign firms and is consequently a potential source of cross-border transfers of capital, knowledge and technology. Hence, the extent of inward and outward foreign direct investment may be essential to productivity growth.

Foreign-owned firms operating in Denmark are generally more productive than purely Danish-owned firms, cf. Table 2. Part of this differ-

CHARACTERISTICS OF FIRMS IN DENMARK, 2008 Table 2

Average	Foreign-owned firms	Danish-owned firms
Number of employees (FTEs)	86	11
Value added (kr. million)	58	6
Labour productivity (kr. 1,000)	683	540
Share with higher education (per cent)	27	15
Share with long-cycle higher education (per cent)	8	5
Share with PhD degree (per cent)	0.4	0.2
Capital intensity (kr. 1,000)	267	325

Note: The statistics include firms with minimum 0.5 full-time equivalents (FTEs), excluding firms in agriculture, fishing and raw materials extraction, energy and water supply, public and personal services, real estate letting and administration as well as unspecified sectors. Labour productivity and capital intensity are calculated as value added and capital stock per FTE, respectively.
Source: Ministry of Economic and Business Affairs (2011).

ence can be attributed to differences in e.g. size and the educational composition of the employees. But even when adjusted for such factors, the productivity of foreign-owned firms is 17-19 per cent higher than that of Danish-owned firms, cf. Pedersen (2011b) and Ministry of Economic and Business Affairs (2011).

There could be several explanations for the observed productivity differentials between Danish-owned and foreign-owned firms. For example, foreign ownership may have a direct beneficial effect on productivity, e.g. via international experience in management and organisation. But another explanation could be that foreign investors tend to acquire the most productive Danish firms rather than low-productivity firms, hence the higher productivity of foreign-owned firms. Finally, international studies point to a third channel that could contribute to explaining the higher productivity of foreign-owned firms. The most productive firms are the ones that establish subsidiaries abroad and become multinational, cf. Helpman, Melitz and Yeaple (2004). All things being equal, the presence of such high-productivity firms will raise the average productivity in society, and such foreign direct investment should therefore be expected to benefit Danish productivity growth.

In conclusion, it is important to bear in mind that the presence of foreign-owned firms in Denmark may also influence the productivity of Danish-owned firms via *spillover* effects. These may be positive (e.g. transfer of knowledge and technology) or negative (e.g. loss of market shares and hence loss of economies of scale). The existing empirical literature provides no firm conclusions on the importance of spillover effects, and there is a need for further studies of how foreign direct investment affects productivity of Danish firms – particularly in the longer term.

LITERATURE

Arnold, Jens Matthias, Bert Brys, Cristopher Heady, Åsa Johansson, Cyrille Schwellnus and Laura Vartia (2011), Tax policy for economic recovery and growth, *The Economic Journal*, No. 121, pp. 59-80.

Bassanini, Andrea, Luca Nunziata and Danielle Venn (2008), Job protection legislation and productivity growth in OECD countries, *IZA discussion paper*, No. 3555.

Borchert, Ingo, Batshur Gootiiz and Aaditya Mattoo (2011), Services in Doha. What's on the table?, in *Unfinished Business? The WTO's Doha Agenda*, edited by Will Martin and Aaditya Mattoo, World Bank.

Borchsenius, Vibeke, Nikolaj Malchow-Møller, Jakob Roland Munch and Jan Rose Skaksen (2010), International trade in services – evidence from Danish micro data, *Nationaløkonomisk Tidsskrift,* Vol. 148(1).

Francois, Joseph and Bernard Hoekman (2010), Services trade and policy, *Journal of Economic Literature*, Vol. 48(3).

Gaard, Søren (2011), Barriers to competition in the Danish economy: potential implications for productivity, presentation at the conference *Explaining and Improving Productivity* held at Danmarks Nationalbank, September.

Gersing, Agnete (2010), Nyorientering af Konkurrencestyrelsen (Reorientation of the Danish Competition Authority – in Danish only), *Samfundsøkonomen*, No. 3, June.

Helpman, Elhanan, Marc J. Melitz, and Stephen R. Yeaple (2004), Export versus FDI with heterogeneous firms, *American Economic Review,* Vol. 94(1).

Junge, Martin and Jan Rose Skaksen (2010), Produktivitet og videregående uddannelse (Productivity and higher education – in Danish only), report prepared for DEA.

Danish Competition and Consumer Authority (2011), Competition and consumer report.

McKinsey & Company (2010), Creating economic growth in Denmark through competition, report prepared for a meeting in the Danish Growth Forum, November 2010.

McMorrow, Kieran (2011), TFP trends: How different is Denmark?, presentation at the conference *Explaining and Improving Productivity* held at Danmarks Nationalbank, September 2011.

Pedersen, Torben (2011), Foreign multinationals: effect on productivity in Denmark?, presentation at the conference *Explaining and Improving Productivity* held at Danmarks Nationalbank, September 2011.

Danish government (2011), A Denmark that stands together, Danish Government Platform.

Skaksen, Jan Rose (2011), International trade in services – an unexploited possibility for higher productivity?, presentation at the conference *Explaining and Improving Productivity* held at Danmarks Nationalbank, September 2011.

Ministry of Economic and Business Affairs (2011), Internationale Virksomheder i Danmark (International firms in Denmark – in Danish only), *Økonomisk Tema*, No. 11.

Ølgaard, Christian (2006), The relevance of GDP growth rates, Danmarks Nationalbank, *Monetary Review*, 4th Quarter.

Models for Banks' Loan Impairment Charges in Stress Tests of the Financial System – Summary

Kim Abildgren, Economics, and Jannick Damgaard, Financial Markets

INTRODUCTION AND SUMMARY

In an international perspective, the financial crisis has led to renewed focus on development of models for assessing financial stability. A case in point is macro stress testing of banks' capitalisation.

A key element of macro stress testing is to calculate banks' loan impairment charges in macroeconomic scenarios with severe negative shocks to the economy. Loan impairment charges are often the decisive factor determining the banks' financial performance and excess capital adequacy in periods of unfavourable macroeconomic developments. This is because credit is at the core of banking activities, so naturally it is also the major source of potential losses.

In Part 2 of this Monetary Review, an empirical study has been carried out of the link between business cycles and the banks' loan impairment charges, cf. Abildgren and Damgaard (2012). Furthermore, two specific econometric models for banks' loan impairment charges are constructed and compared; these models may be used for stress testing purposes. Finally, the limitations on the use of such models for macro stress testing are discussed. This overview provides a non-technical summary of the main findings and conclusions of the article.

The current accounting principles entail considerable cyclical variation in the banks' loan impairment charge ratios. Loan impairment charges are relatively high in years when the economy is slowing down and bank earnings are under pressure, while they are relatively low in years with high economic growth and sound bank earnings. This link between the banks' loan impairment charges and the business cycle should be reflected in the models used for calculating loan impairment charges in stress tests.

All else equal, loan impairment charges under the current accounting principles increase the banks' lending capacity during booms and reduce their lending capacity during recessions. Hence the accounting rules for

loan impairment charges are procyclical, i.e. they amplify cyclical fluctuations. In the wake of the most recent financial crisis it has been discussed whether there is a need to amend the accounting rules so as to ensure that banks build up buffers against losses in bad times in good times.

Both of the estimated models provide a good description of the historical development in loan impairment charges and are able to explain the high loan impairment charge ratios during the crisis from 2008 onwards.

By definition, all models are simplified presentations of reality. So when constructing model-based projections it is customary to include extra information besides that contained in the model's estimated relations. During the most recent financial crisis, for example, the Danish government has implemented extensive measures to support financial stability. Without these initiatives, the economic crisis would undoubtedly have been worse, and the banks' loan impairment charges would have been larger than they actually were. This should be borne in mind if the models are to be used for simulating loan impairment charges in stress scenarios without such massive government support.

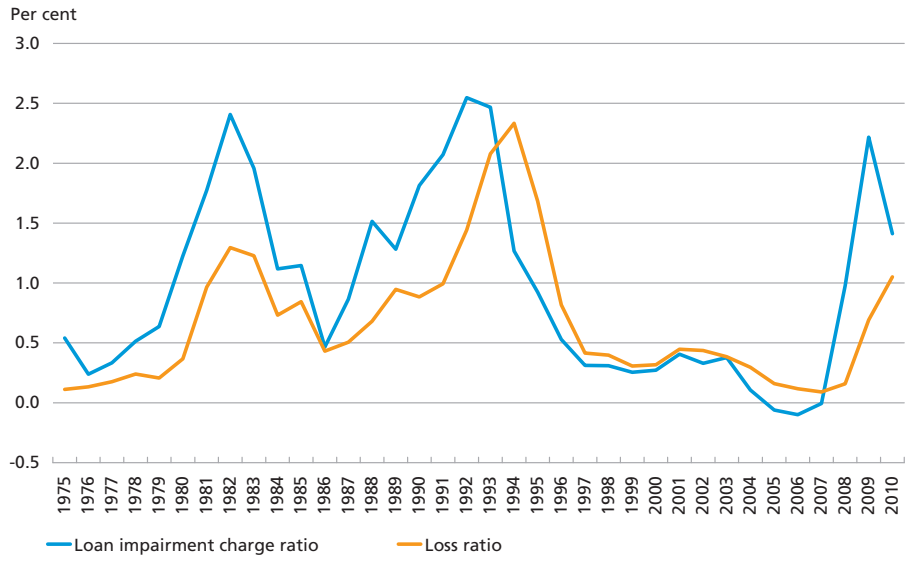
THE BANKS' LOAN IMPAIRMENT CHARGES

There is considerable cyclical variation in the banks' loan impairment charge ratios, cf. Chart 1. Under the present accounting rules from 2005, exposures are not to be charged to impairment expenses until there is objective evidence of impairment. In good times with low unemployment and sound corporate earnings, the number of non-performing loans etc. is relatively small, resulting in low loan impairment charge ratios. Conversely, the number of non-performing loans is relatively high in a recession, entailing high loan impairment charge ratios.

There was also considerable cyclical variation in the banks' loan impairment charges before 2005. Loan impairment charges made in the years up to the early 1990s helped to ensure that the banks had buffers which they could use to meet losses during the economic crisis in the first half of the 1990s. This was one of the reasons why Denmark weathered the crisis much better than the other Nordic countries. In Finland, profit and loss accounts were, until 1990, based on expensing actual losses only. In Norway and Sweden, provisions had to be made for expected losses, but in Sweden the requirements in this respect had been eased when the banking crisis began, and in Norway the requirements had by no means been observed in practice, cf. Abildgren et al. (2010).

DANISH BANKS' LOSSES AND IMPAIRMENT CHARGES ON LOANS AND GUARANTEES

Chart 1



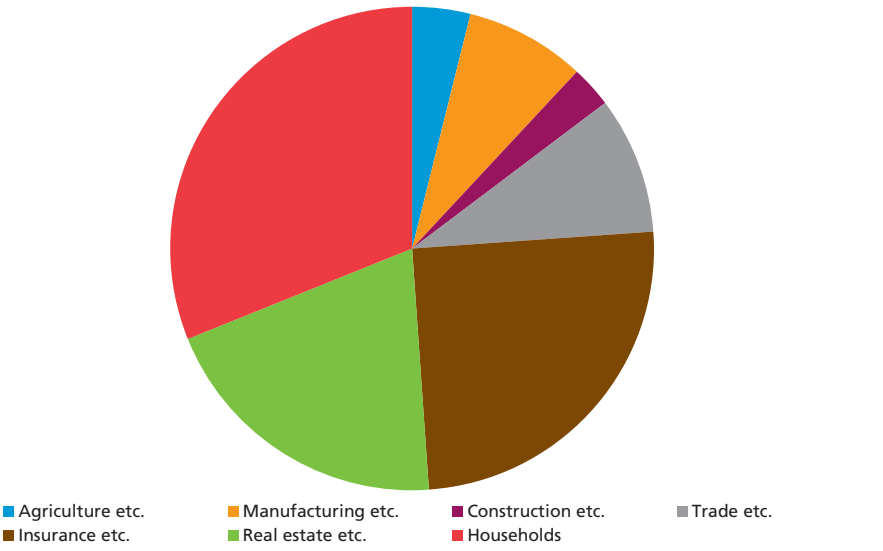
Note: Loan impairment charges have been stated net of reversal of previous loan impairment charges as income. There is a data break in the series for loan impairment charges in 2005, when the accounting standards were amended.
Source: Danish Financial Supervisory Authority, Baldvinsson et al. (2005) and Busch-Nielsen et al. (1996).

Since the mid-1980s, there has been a tendency to make loan impairment charges 1-2 years before realisation of the losses. So far this does not seem to have changed since the transition to the new accounting rules in 2005.

Very little detailed statistical information is available about the banks' loan impairment charges. Based on the statistics of the banks' losses and accumulated loan impairment charges published by the Danish Financial Supervisory Authority, Abildgren and Damgaard (2012) approximate the banks' loan impairment charges by industry and sector since 1992.

Chart 2 shows the banks' exposures broken down by industry at end-2010, while the calculated loan impairment charge ratios since 1992 are shown in Chart 3. It should be noted that these loan impairment charge ratios concern the banks' total credit exposures to the industry or sector in question – whether or not the customer is a Danish resident. According to Danmarks Nationalbank's MFI statistics, non-residents – mainly residents of Sweden, Norway, Ireland, the UK, the Baltic States and the USA – are counterparties to around 40 per cent of lending to non-MFIs by Danish banks and their foreign branches. However, the existing statistics do not provide a basis for breaking down loan impairment charge ratios by customer geographics.

DANISH BANKS' LOANS AND GUARANTEES BY INDUSTRY AND SECTOR, END-2010 Chart 2



Note: Agriculture etc. includes agriculture, hunting, forestry and fisheries. Manufacturing etc. includes manufacturing, extraction of raw materials and energy supplies. Construction etc. includes building and construction. Trade etc. includes trade, transport, hotels and restaurants and information and communication. Insurance etc. includes financing (excl. credit institutions) and insurance. Real estate etc. includes real estate, other private business sectors and the public sector. Households include wage earners and pensioners etc., but not the self-employed. Lending to private individuals against real property as collateral is included in households, not in real estate etc.
Source: Danish Financial Supervisory Authority.

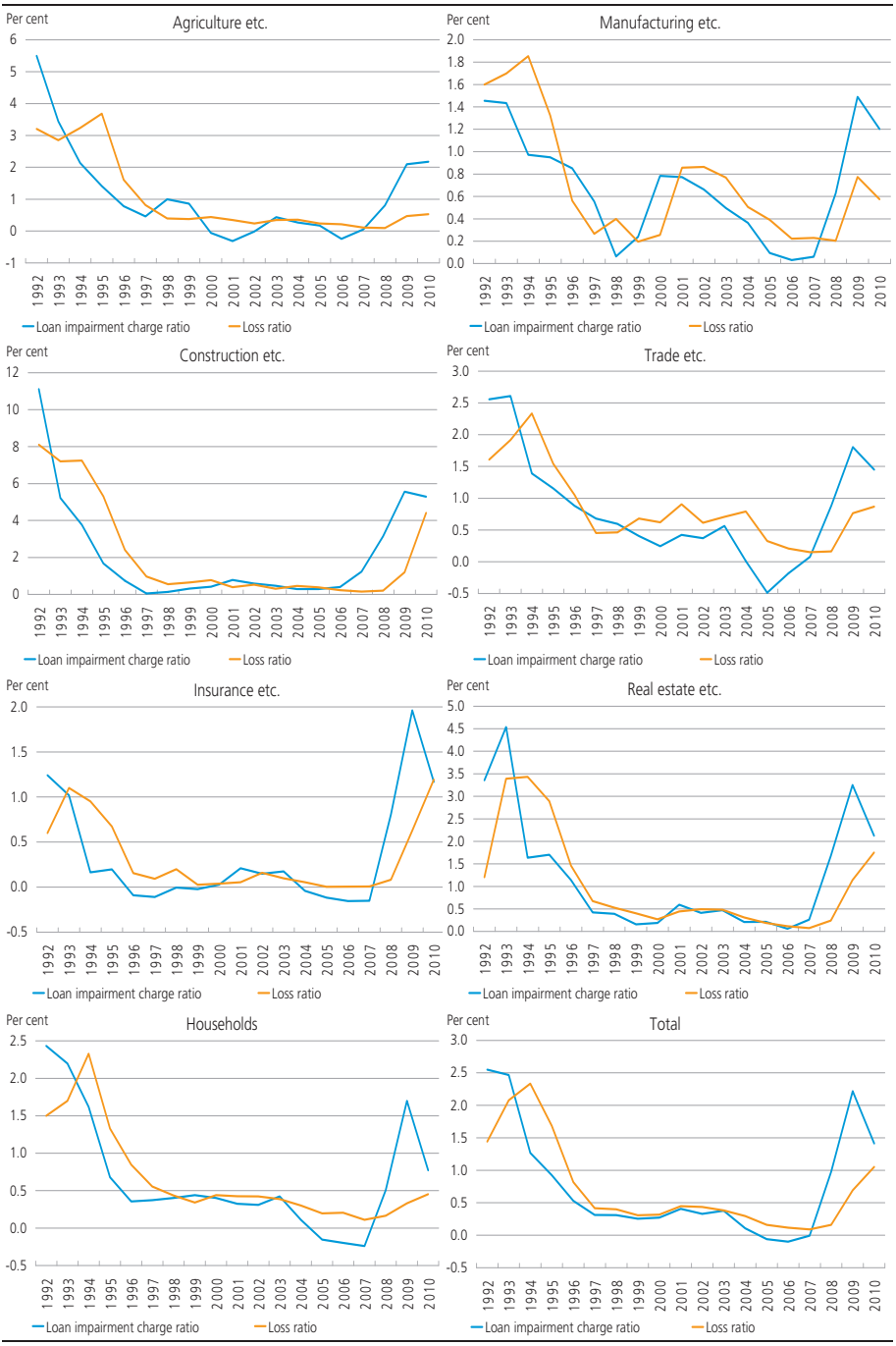
Although the approximated loan impairment charge ratios are subject to some uncertainty, several clear trends nevertheless emerge. For all industries and sectors, there is a tendency to make loan impairment charges 1-2 years before realisation of the losses. It is also seen that loan impairment charge ratios were relatively high in connection with the economic crisis in the early 1990s and the financial crisis from 2008 onwards, especially for agriculture etc., construction etc. and real estate etc.

The cyclical variation in the banks' loan impairment charge ratios is reflected in their interest margins. Interest margins tend to be relatively narrow during upswings and relatively wide during downturns, cf. Abildgren (2012). The banks' expected losses and hence their loan impairment charges can be seen as the costs of providing loans and guarantees etc., in line with staff and IT costs etc., and the banks need to cover these costs by charging an appropriate premium, which is added to the financing and administrative costs etc., cf. Andersen et al. (2001).

All else equal, the current accounting principles for loan impairment charges contribute to increasing the banks' lending capacity during

DANISH BANKS' LOSSES AND IMPAIRMENT CHARGES ON LOANS AND GUARANTEES BY INDUSTRY AND SECTOR

Chart 3



Note: The aggregate loan impairment charges have not been calculated, but are based directly on the Danish Financial Supervisory Authority's accounts statistics.

Source: Abildgren and Damgaard (2012).

booms and reducing it during recessions. Hence the current loan impairment charge rules are procyclical, i.e. they amplify cyclical fluctuations. In the wake of the most recent financial crisis, it has therefore been discussed whether there is a need to amend the rules with a view to reducing procyclicality in the banking sector, cf. Babic (2009) and Babic and Rasmussen (2010). One element of the debate has been the "Spanish model" for making provisions. This model entails that Spanish credit institutions must make loan impairment charges not only according to the principle of objective evidence of impairment ("specific provisions"), but also on the basis of average historical loss ratios over a business cycle ("dynamic provisions"). In periods with low specific provisions, the dynamic provisions are increased, while they are reduced in period with high specific provisions. This means that a bank's total loan impairment charges in a given period become less cyclical, and in good times the bank builds up a buffer against losses in bad times.

In July 2009, the European Commission published its deliberations concerning implementation of dynamic provisions in accordance with the Spanish model as a supplement to loan impairment charges under the existing international accounting standards. In the European Commission's consultation paper from February 2010, the thoughts about dynamic provisions had made way for contemplations about "countercyclical provisions" also aimed at ensuring that the banks, via loan impairment charges, build up buffers against their expected losses over a business cycle. The Commission has not followed up these proposals subsequently. So far, the regulatory response to the financial crisis in relation to the issue of procyclicality in the banking sector has mainly focused on introducing countercyclical capital buffers, cf. Harmsen (2010) and Babic (2011).

Currently, the international accounting standards boards, IASB[1] and FASB[2], are working on proposals for new accounting standards to ensure that loan impairment charges are made at an earlier point than under the current principles. However, the proposals from the IASB and the FASB do not envisage smoothing of loan impairment charges over the business cycle.

[1] The International Accounting Standards Board, an independent organisation working to make financial statements comparable across countries.

[2] The Financial Accounting Standards Board, which develops accounting standards that are generally accepted in the USA.

TWO ECONOMETRIC MODELS FOR DANISH BANKS' LOAN IMPAIRMENT CHARGES

There are several approaches to modelling banks' loan impairment charges in connection with macro stress testing of the financial system. These approaches differ in terms of degree of detail as well as methodology. Abildgren and Damgaard (2012) construct and compare two specific econometric models for banks' loan impairment charges.

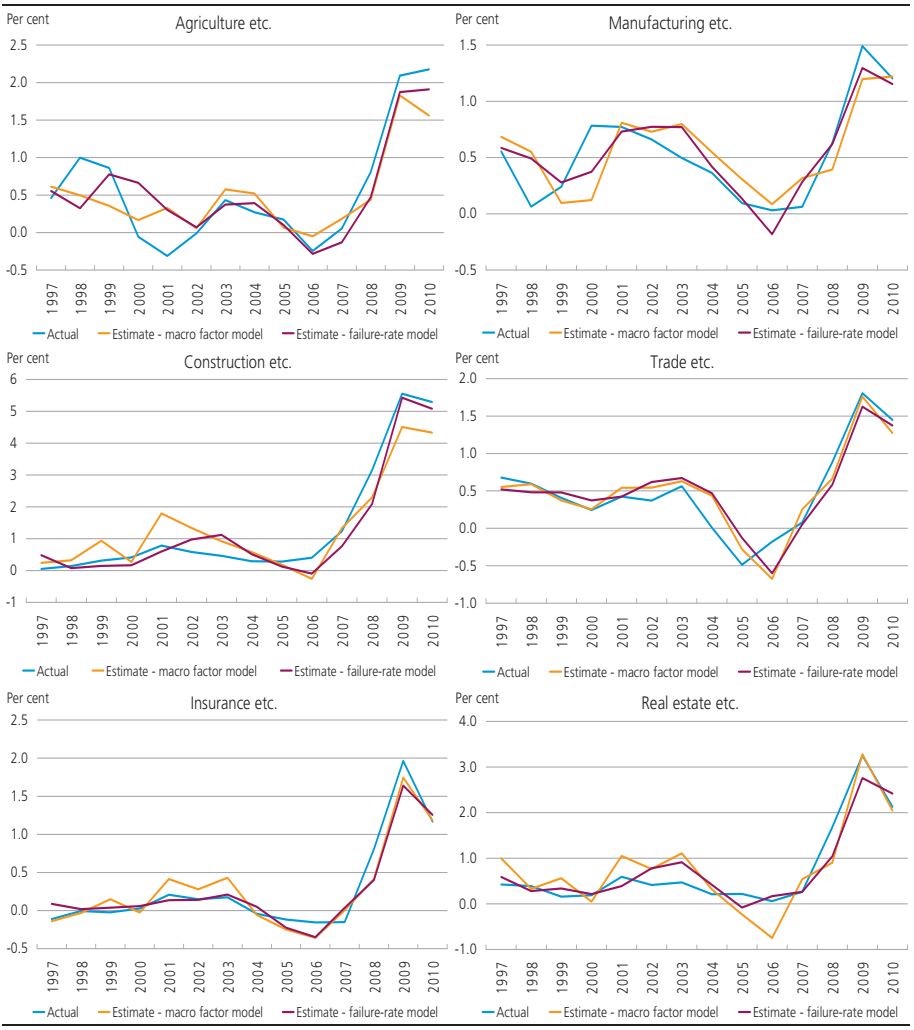
The first model is a macro factor model in which the impairment charge ratio for Danish banks' loans and guarantees is modelled as a function of a number of macroeconomic variables from the period 1992-2010. As regards the impairment charge ratio for loans and guarantees to households, the explanatory variables are the unemployment rate and real growth in house prices. As regards the impairment charge ratios on loans and guarantees to the six industries, the explanatory variables are real growth in demand for the industry's output, real interest rates and real growth in house prices. The latter can be seen as an indicator of real growth in the prices of commercial properties. With the estimated macro factor model, it is possible to calculate the industry/sector distribution of loan impairment charge ratios over the projection period for each of the scenarios included in a stress test. Combining this information with the individual bank's credit exposures by industry and sector over the projection period makes it possible to calculate the individual bank's loan impairment charges for each scenario. This allows the distribution of credit exposures to households and the various industries to be taken into account.

The second model is an accounts-based failure-rate model for Danish banks' loan impairment charge ratios for corporate credit exposures. The model is estimated on the basis of the financial statements from an average of around 96,000 firms in the period 1995-2009. Essentially, stress testing using this model type means constructing a number of macroeconomic scenarios for future economic developments. On the basis of developments in the real gross domestic product, building and construction investment and real interest rates, developments in the key financial ratios of each firm are projected in the various scenarios, after which the individual firm's probability of default and the banks' loan impairment charges can be calculated.

Chart 4 compares the actual loan impairment charge ratios with the estimated loan impairment charge ratios from the macro factor model and the accounts-based failure-rate model, respectively, as regards corporate lending. Both models provide a fairly good description of the historical development in loan impairment charges and are able to ex-

ACTUAL AND ESTIMATED IMPAIRMENT CHARGE RATIOS ON LOANS AND GUARANTEES FROM DANISH BANKS

Chart 4



Source: Abildgren and Damgaard (2012).

plain the high loan impairment charge ratios during the crisis from 2008 onwards. This is an important feature of models that are to be used for macro stress testing.

LIMITATIONS ON THE USE OF ECONOMETRIC MODELS FOR STRESS TESTING

By definition, all econometric models are simplified representations of reality. So when constructing model-based projections it is customary to include extra information besides that contained in the model's estimated relations. This information is implemented using "adjustment terms".

A model can be seen as an instrument for making projections in dialogue with its user. This also applies to models for banks' loan impairment charges. Models help the user to ensure consistency in the analyses performed and may provide inspiration for disseminating the "stories" contained in the scenarios.

It is also customary to work with a range of models based on different approaches. Applying different types of models for the banks' loan impairment charges provides a more robust picture of the risks associated with the various stress scenarios. Different models may have different strengths and provide different opportunities for illustrating the respective scenarios in terms of coverage, degree of detail, etc. For example, the failure-rate model provides a basis for gaining a very detailed overview of developments in probabilities of default over the projection period, broken down by, say, sub-sectors and corporate debt levels. This makes it easier to incorporate additional information for stress testing purposes.

It is necessary to add a few specific comments as regards application of the two estimated loan impairment charge models in connection with stress testing of the financial system.

The period 1992-2010 – which has been used for estimating the macro factor model – was characterised by a clear downward trend in both unemployment and short-term and long-term real interest rates. It is therefore uncertain whether the parameter estimates of the models can be assumed to apply to periods of sharp increases in unemployment and interest rates over a short-term horizon. Similar issues apply in relation to the accounts-based failure-rate model, which has been estimated on the basis of an even shorter data period than the macro factor model.

Moreover, the models do not take into account any differences in the credit quality of the individual banks' loans and guarantees for a given industry. This may also entail a need for adjustment terms for some banks.

One way to take into account differences in credit quality could be to take the bank-specific data for total loan impairment charges and loans and guarantees broken down by industry/sector reported to the Danish Financial Supervisory Authority as the point of departure. On the basis of the banking sector's aggregate loan impairment charge ratios by industry and sector, cf. Chart 3, and the bank-specific exposures, it is possible to calculate the total loan impairment charges that each bank would have made if its loan impairment charge ratio had matched that of the sector overall. If a given bank has systematically had higher actual loan impairment charge ratios than those that can be calculated on the basis of the banking sector's aggregate loan impairment charge ratios

by industry and sector, this could indicate that the loans granted by the bank in question involve a relatively high credit risk. In addition, it could be investigated whether lending and funding rates can be applied as indicators for the credit quality of a bank's loan portfolio. An advantage of interest-rate indicators is that they are more forward-oriented than historical loan impairment charges.

As regards the failure-rate model, the database provides information about the firm's main bank for around half of the firms. If the firms that have stated their main bank can be assumed to be representative of the loan portfolios of the individual banks, this will provide a basis for including bank-specific differences in terms of the credit quality of loans and guarantees in the loan impairment charges calculated using the failure-rate model.

During the most recent financial crisis, the Danish government has implemented extensive support measures, e.g. Bank Rescue Package 1 (general government guarantee for the banks' depositors and unsecured creditors) in October 2008, and Bank Rescue Package 2 (government capital injections into banks and the option to purchase individual government guarantees for non-subordinated unsecured debt) in February 2009. Without these initiatives, the economic crisis would undoubtedly have been worse, and the banks' loan impairment charges would have been larger than they actually were. This should be borne in mind if the models are to be used for simulating loan impairment charges in stress scenarios without such massive government support.

Furthermore, it should be noted that any feedback effects from a stressed banking sector to the macroeconomy must, to some extent, be treated separately outside the models. Actual historical loan impairment charge ratios used for estimating the models reflect the historical feedback effects seen in connection with banking crises. If the stress scenarios analysed involve macroeconomic developments that are worse than those seen during the banking crises occurring in the estimation period, it may be necessary to incorporate further feedback effects outside the models.

It is also possible that the effects of banking crises on loan impairment charges depend on the frequency of such banking crises. For example, if one banking crisis follows immediately after another, the impact on loan impairment charges may be greater than if the banking crises are 15-20 years apart. The reason is that households and firms have little time to consolidate if one financial crisis is succeeded by another.

Finally, it should be mentioned that although there are many similarities between financial crises, they also differ. To the extent that a stress scenario includes new risk factors not reflected in historical events,

it may be necessary to adjust the results calculated using loan impairment charge models estimated on the basis of historical data.

CONCLUDING REMARKS

The period since the mid-1990s has been characterised by increased focus on financial stability among central banks worldwide. In 1996, the Bank of England began to publish regular Financial Stability Reviews focusing on financial institutions, financial markets and payment systems. Sveriges Riksbank and Norges Bank followed suit in 1997, and today around 80 central banks worldwide publish such reports, cf. Cihák et al. (2012). Danmarks Nationalbank began to publish financial stability reports in 2000.[1]

A key element of many financial stability reports has been macro stress tests of the financial system. In 2009, the European Banking Authority, working in collaboration with the European Central Bank and the national supervisory authorities, also began to perform regular macro stress tests of the banking system. So it is likely that focus in the coming years will still be on refining the approaches and methods used to model banks' loan impairment charges in connection with macroeconomic stress tests with a view to improving the basis for assessment of financial stability.

LITERATURE

Abildgren, Kim (2012), Business cycles and shocks to financial stability – empirical evidence from a new set of Danish quarterly national accounts 1948-2010, *Scandinavian Economic History Review*, Vol. 60(1).

Abildgren, Kim and Jannick Damgaard (2012), Models for banks' loan impairment charges in stress tests of the financial system, Danmarks Nationalbank, *Monetary Review*, 1st Quarter, Part 2.

Abildgren, Kim, Bodil Nyboe Andersen and Jens Thomsen (2010), *Monetary history of Denmark 1990-2005*, Danmarks Nationalbank.

Andersen, Kristian Sparre, Jens Verner Andersen and Leif Lybecker Eskesen (2001), Models for management of banks' credit risk, Danmarks Nationalbank, *Monetary Review*, 1st Quarter.

Babic, Borka (2009), Credit institutions and procyclicality, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter.

[1] For the first two years, these reports were part of Danmarks Nationalbank's Monetary Review.

Babic, Borka (2011), Status on Basel III – liquidity and capital, Danmarks Nationalbank, *Monetary Review*, 1st Quarter.

Babic, Borka and Anne-Sofie Reng Rasmussen (2010), Regulatory initiatives in the financial sector, Danmarks Nationalbank, *Monetary Review*, 1st Quarter.

Baldvinsson, Cato, Torben Bender, Kim Busch-Nielsen and Flemming Nytoft Rasmussen (2005), *Dansk bankvæsen* (*The Danish banking sector* – in Danish only), 5th edition, Forlaget Thomson.

Busch-Nielsen, Kim, Kai Hammer-Pedersen, Peter Engberg Jensen and Carl Aage Otholm (1996), *Dansk bankvæsen – i dag – i morgen* (*The Danish banking sector – today – tomorrow* – in Danish only), 3rd edition, Forlaget FSR.

Cihák, Martin, Sònia Muñoz, Shakira Teh Sharifuddin and Kalin Tintchev (2012), Financial stability reports: what are they good for?, *IMF Working Papers*, No. 1, January.

Harmsen, Mads Peter Pilkjær (2010), Basel III: macroprudential regulation by means of countercyclical capital buffers, Danmarks Nationalbank, *Monetary Review*, 4th Quarter.

Danmarks Nationalbank's Earnings and Risk During the Crisis

Søren Schrøder and Susanne Hougaard Thamsborg, Financial Markets

INTRODUCTION

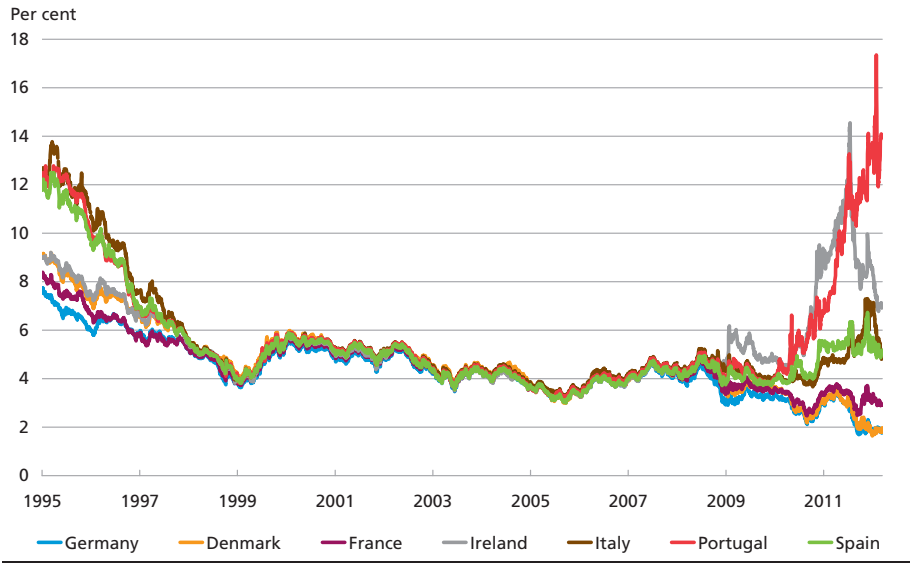
Central banks across the world have played an important role during the financial turmoil that started in August 2007. With the collapse of Lehman Brothers in September 2008 the turmoil developed into an international financial crisis and subsequently into the sovereign debt crisis in the euro area. Monetary policy has been eased in many countries, interest rates are at record lows and extraordinary measures have been taken to support the banks' liquidity and access to funding. These measures have mitigated the impact of the crisis and influenced central banks' balance sheets, earnings and risk. This is also the case for Danmarks Nationalbank. The foreign-exchange reserve has increased almost fivefold since the trough in October 2008, and the monetary-policy instruments have been expanded.

Danmarks Nationalbank's earnings have been high during the crisis, largely reflecting capital gains on gold and bonds. Danmarks Nationalbank's underlying earnings depend on interest-rate levels and with the current low interest rates Danmarks Nationalbank generates a low income from interest. Moreover, the increased foreign-exchange reserve could result in stronger fluctuations in profit in the future, which entails the risk of a deficit.

Danmarks Nationalbank's financial risks have increased. The balance sheet has expanded and the volume of assets considered to be risk-free has declined. Credit ratings of sovereign issuers and banks have been downgraded on numerous occasions. Since the foreign-exchange reserve is predominantly invested in euro assets – because of the fixed-exchange-rate policy – Danmarks Nationalbank is exposed to the sovereign debt crisis in the euro area, due to its role as monetary authority. Following a prolonged period of narrow spreads between euro area government bonds, the spreads have become visible again, cf. Chart 1, and the markets now differentiate more between the credit quality of the various euro area member states. However, Danmarks National-

YIELDS ON 10-YEAR GOVERNMENT BONDS FOR SELECTED EURO AREA MEMBER STATES AND DENMARK

Chart 1



Note: At the beginning of March, the Greek 10-year government yield was 36 per cent, but in the period 1999-2008 it matched the levels of the other euro area member states.
Source: Reuters EcoWin.

bank's overall financial risks remain limited due to very high credit quality and risk management requirements.

This article broadly outlines the impact of the crisis on Danmarks Nationalbank's balance sheet and earnings as well as risk management.

DANMARKS NATIONALBANK'S BALANCE SHEET DURING THE CRISIS

The financial crisis has had a major impact on Danmarks Nationalbank's balance sheet and its composition. The balance sheet reflects Danmarks Nationalbank's role as monetary authority conducting Denmark's monetary and exchange-rate policies, issuing banknotes and coins and acting as banker to the banks as well as to the central government, cf. Box 1.

Danmarks Nationalbank's balance sheet emerged largely unaffected from the first phase of the crisis in 2007. Denmark was not seriously impacted until the collapse of Lehman Brothers when international investors fled the minor currencies. This put pressure on the krone, and Danmarks Nationalbank supported the krone by selling foreign exchange and buying kroner, i.e. through intervention in the foreign-exchange market. Although Danmarks Nationalbank raised its monetary-policy interest rates, it could not prevent a substantial decline in the for-

DANMARKS NATIONALBANK'S BALANCE SHEET — Box 1

The assets side of the balance sheet mainly comprises foreign assets (foreign-exchange-reserve assets), gold, lending to banks and domestic bonds, cf. the Table. The liabilities side mainly comprises the central government's deposit and deposits by banks. To this should be added banknotes and coins in circulation and Danmarks Nationalbank's net capital.

BALANCE SHEET AT END-FEBRUARY 2012, KR. BILLION

Assets		Liabilities	
Foreign assets	480	Banknotes and coins in circulation	60
Gold	19	Net capital	66
Total lending	4	Central government's deposit	274
Domestic bonds	34	Deposits by banks	111
Other assets	3	Other liabilities	29

Note: Total lending mainly comprises loans to banks and monetary-policy loans.
Source: Danmarks Nationalbank.

An increase in the foreign-exchange reserve is typically offset by an increase in deposits by banks or an increase in the central government's deposit, cf. Chart 2. Danmarks Nationalbank's balance sheet is also impacted by a number of other factors such as the central government borrowing and payments, monetary-policy operations and transactions with the International Monetary Fund, IMF.

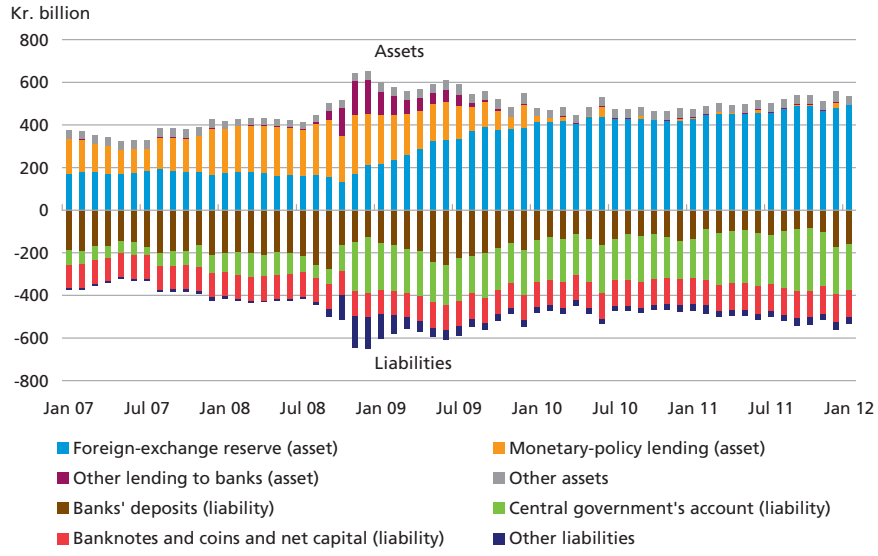
eign-exchange reserve,[1] and it was assessed that a larger reserve was needed.

The foreign-exchange reserve has subsequently increased and at the end of February 2012 amounted to almost kr. 500 billion, cf. Chart 2. At the onset of the crisis it was expanded by the central government raising extraordinary foreign loans.[2] The central government's contribution to the reserve has subsequently been reduced due to a significant inflow of foreign exchange, which has contributed to the reserve.

An increase in the foreign-exchange reserve is offset by higher debt to banks or an increase in the central government's deposits at Danmarks Nationalbank. The size of the reserve should not be confused with Danmarks Nationalbank's net worth, or net capital, which is not earmarked for specific assets.

1 For further details, see Danmarks Nationalbank (2010).
2 The central government raises foreign loans for foreign-exchange reserve purposes. The foreign-exchange proceeds from the central government's loans are exchanged for kroner at Danmarks Nationalbank. In that way Danmarks Nationalbank's foreign-exchange reserve is increased, while the deposit in the central government's account increases correspondingly.

DANMARKS NATIONALBANK'S BALANCE SHEET Chart 2



Note: Calculated at the end of the month. Other assets comprise e.g. swap facilities, shares and tangible fixed assets. Other liabilities comprise, e.g., swap facilities and the counterpart of Special Drawing Rights, SDR, allocated by the IMF.
Source: Danmarks Nationalbank's statistics database.

The balance sheet is not only impacted by the increase in the foreign-exchange reserve but also by extraordinary monetary-policy measures. In the autumn of 2008, Danmarks Nationalbank, like other central banks, established swap lines with the Federal Reserve and the ECB with a view to offering dollar and euro liquidity to Danish banks. That temporarily expanded the balance sheet.

The collapse of Lehman Brothers made the banks reluctant to lend to each other. Instead they placed excess liquidity at Danmarks Nationalbank. In order to give the banks greater incentive to place liquidity with each other, Danmarks Nationalbank in 2009 introduced an interest margin between the lending rate and the rate of interest on certificates of deposit. In consequence, the banks have reduced their gross positions vis-à-vis Danmarks Nationalbank. Moreover, since the net position has been positive, i.e. the banks' deposits exceed their loans at Danmarks Nationalbank, their borrowing from Danmarks Nationalbank has been negligible.

Danmarks Nationalbank is not the only central bank to have an increased balance sheet with a changed composition during the crisis. According to BIS (2011), in the western economies central-bank balance sheets made up just over 20 per cent of the gross domestic product, GDP, in 2011 compared with just over 10 per cent in the years up to

2008. This reflects comprehensive liquidity allotment and quantitative easing with purchases of e.g. government bonds to keep interest rates low and support economic activity during the crisis.[1]

The expansion of balance sheets and the extraordinary measures make the central banks more vulnerable to developments in the financial markets, which could have an impact on earnings and risk in the years ahead.

DANMARKS NATIONALBANK'S PROFIT IMPACTED BY THE CRISIS

During the crisis, Danmarks Nationalbank's profit has fluctuated between kr. 4 billion and kr. 8 billion, roughly corresponding to the pre-crisis level, cf. Chart 3. The profit reflects, in particular, Danmarks Nationalbank's role as monetary authority – for instance, Danmarks Nationalbank issues banknotes and coins and holds a stock of gold, cf. the Danmarks Nationalbank Act. To this should be added the fixed-exchange-rate policy which requires a substantial foreign-exchange reserve.

The profit also reflects the fact that besides its role as monetary authority, Danmarks Nationalbank assumes additional financial risks to achieve a reasonable risk/return trade-off. The choice of risk level is subject to a prudential approach.

The main profit contributors, interest income and value adjustments, are discussed below.

Since the onset of the financial crisis, a major share of the profit has been attributable to value adjustments. In particular, rising gold prices have increased the value of Danmarks Nationalbank's stock of gold, cf. Chart 3. One explanation of the rise in gold prices is growing investor demand for gold during times of turmoil.[2]

As a result of a slight strengthening of the krone vis-à-vis the euro within the fluctuation band, Danmarks Nationalbank incurred a loss on its foreign-exchange exposure in 2011. The foreign-exchange exposure is primarily in euro and as a result of the fixed-exchange-rate policy vis-à-vis the euro, any losses or gains over time will be insignificant.

Add to this that the decline in bond yields has resulted in capital gains.

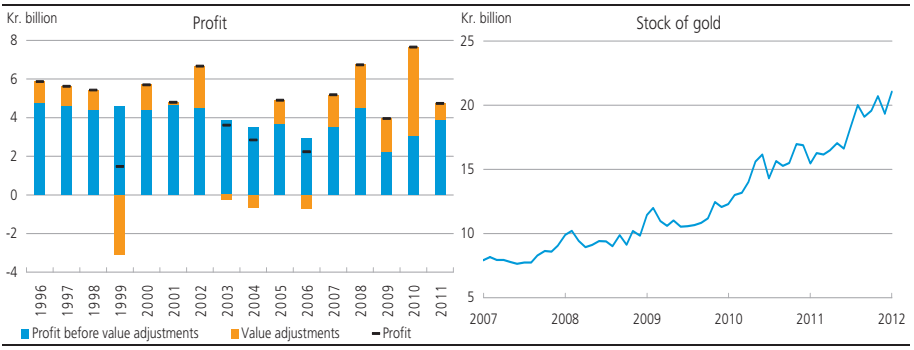
The capital gains on gold and bonds are expected to be temporary whereas the low level of interest rates implies low interest income in the future. A rise in interest rates could, at first, lead to a capital loss, but Danmarks Nationalbank's interest income will grow in the longer term.

---

1 The measures taken by a number of central banks are described in e.g. Stone et al. (2011) and in Jørgensen et al. (2011).

2 The development in gold prices etc. is described in Jensen and Sørensen (2010).

DANMARKS NATIONALBANK'S PROFIT AND VALUE OF GOLD STOCK — Chart 3

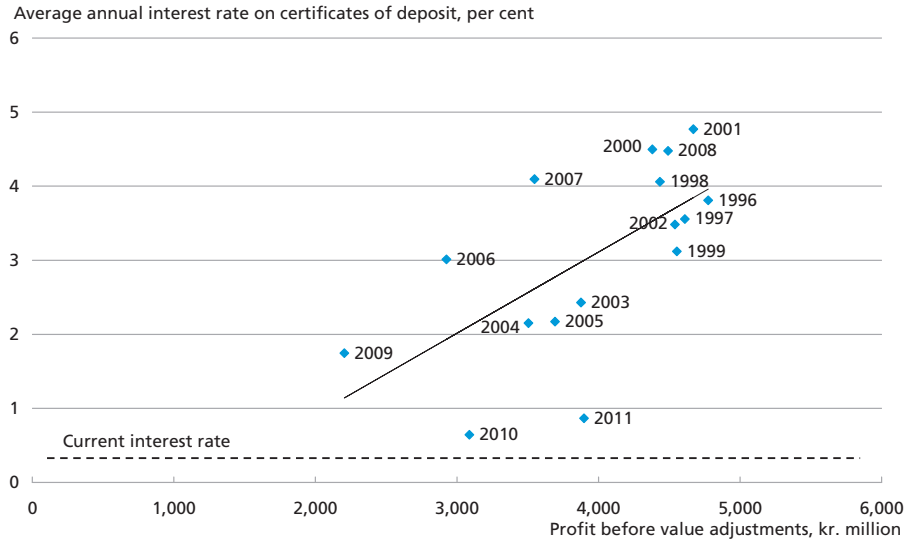


Source: Danmarks Nationalbank.

Profit before value adjustments mainly depends on the level of interest rates

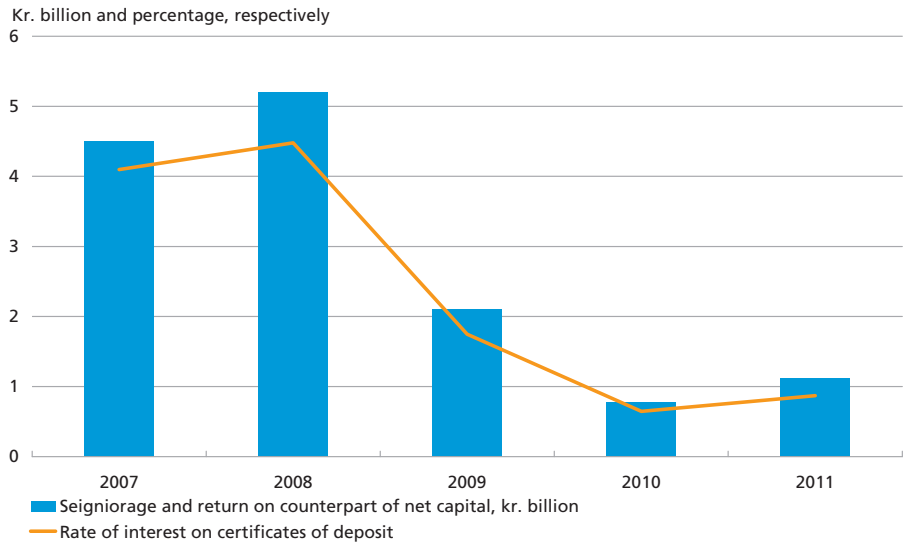
Both the USA and Europe pursue highly accommodative monetary policies in response to the multi-year financial crisis. Interest rates are historically low and, *ceteris paribus*, this puts pressure on Danmarks Nationalbank's profit because the level of interest rates impacts the profit before value adjustments, cf. Chart 4. Other factors besides the level of interest rates also influence the profit before value adjustments in the individual years, which explains why the profit does not correlate perfectly with the level of interest rates in the chart. This reflects, among

MONETARY-POLICY RATE AND DANMARKS NATIONALBANK'S PROFIT BEFORE VALUE ADJUSTMENTS — Chart 4



Source: Danmarks Nationalbank.

CALCULATED SEIGNIORAGE AND RETURN ON COUNTERPART OF NET CAPITAL Chart 5



Note: It is assumed that the counterpart of net capital as well as banknotes and coins in circulation accrue interest at the rate of interest on certificates of deposit. The rate of interest on certificates of deposit used in the chart is the average annual rate.
Source: Danmarks Nationalbank.

other things, that Danmarks Nationalbank may generate a return or loss by assuming risk.

Danmarks Nationalbank's net income from interest largely stems from the return on the counterpart of net capital and the issuance of banknotes and coins. The income from banknotes and coins in circulation is known as seigniorage and reflects Danmarks Nationalbank's gain from issuing banknotes and coins. Danmarks Nationalbank does not pay interest on banknotes and coins and in consequence makes a gain on the difference between zero and the monetary-policy interest rates on the value of banknotes and coins in circulation.

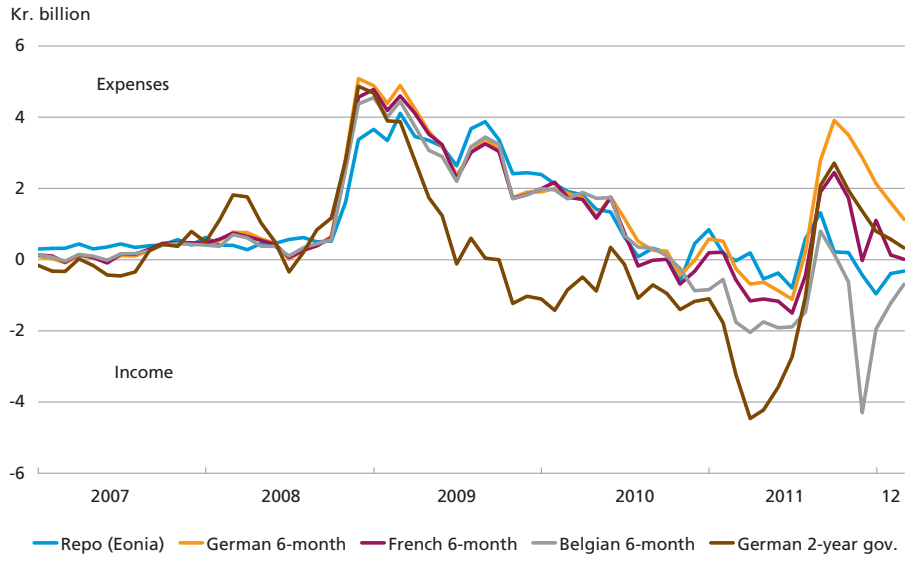
Danmarks Nationalbank's gain on banknotes and coins in circulation and net capital has dropped along with the decline in interest rates since the onset of the crisis, cf. Chart 5. The level of interest rates is thus of great significance to interest income and, hence, profit before value adjustments.

Profit is also impacted by expenses of holding the foreign-exchange reserve

Danmarks Nationalbank's foreign-exchange reserve enables it to intervene in the foreign-exchange market. Profit before value adjustments is impacted by expenses of holding the foreign-exchange reserve. The expenses can be roughly estimated based on the spread between Dan-

STYLISED CALCULATION OF ANNUAL EXPENSES OF HOLDING THE FOREIGN-EXCHANGE RESERVE

Chart 6



Note: The expenses are measured on an annual basis and are calculated as a rough estimate by multiplying the size of the foreign-exchange reserve by the spread between alternative rates on investment and the financing interest rate (the rate of interest on certificates of deposit). Negative values represent an income while positive values represent expenses. The 6-month rates are on German, French and Belgian T-bills.

Source: Reuters EcoWin and own calculations.

marks Nationalbank's rate on investment abroad and its financing interest rate. If the rate on investment is a short-term euro interest rate without any interest-rate risk and the financing interest rate is the rate of interest on certificates of deposit, Danmarks Nationalbank will usually have expenses of holding the foreign-exchange reserve. The reason is that short-term euro interest rates are typically lower than the rate of interest on certificates of deposit. That was the case e.g. in 2008 when interest rates on the investment currencies declined while Danmarks Nationalbank's interest expenses increased because of the pressure on the krone and the subsequent interest-rate increases, cf. Chart 6.

The estimated expenses of holding the foreign-exchange reserve largely depend on the interest rate on investment used for the calculation. The short-term euro money-market interest rate, Eonia, largely corresponds to Danmarks Nationalbank's typical interest rate on investment in the money market. If Danmarks Nationalbank assumes more risk by e.g. increasing the credit or interest-rate risk, it can invest the reserve at higher interest rates. This reduces the calculated expenditure – or even reverses it to income. It could be in the form of short-term Belgian securities, for instance. In practice, Danmarks Nationalbank invests most of the foreign-exchange reserve in securities with low credit risk and

high liquidity to be able to intervene for substantial amounts at short notice. The remainder is invested in securities with a slightly higher risk to ensure a reasonable risk/return trade-off.

Other factors impacting the profit for the year

Other factors than the level of interest rates have an impact on the profit before value adjustments from one year to the next. For example, Danmarks Nationalbank had non-recurring income of kr. 154 million in 2011 in connection with the phasing out of the 25-øre coin. Danmarks Nationalbank also makes a profit on the interest margin between the deposit and lending rates offered to the banks. Lending is currently very limited and the income from this activity has been modest in the past few years. In addition, the remuneration of the central government's deposit in Danmarks Nationalbank was lowered during the crisis. The lower interest rate led to lower interest expenses for Danmarks Nationalbank and, hence, a higher profit before value adjustments. Finally, the distribution between interest rates and capital gains on bonds may also be of significance to the profit before value adjustments.[1]

Payable to the central government

Under the Danmarks Nationalbank Act, any profit after distribution is payable to the central government. Over the past 10 years, 60-80 per cent of the profit before value adjustments has been paid to the central government while the remainder has been allocated to the General Reserves which constitute the main part of Danmarks Nationalbank's net capital.[2] The distribution of profit for the year is determined from year to year, based on a specific assessment.

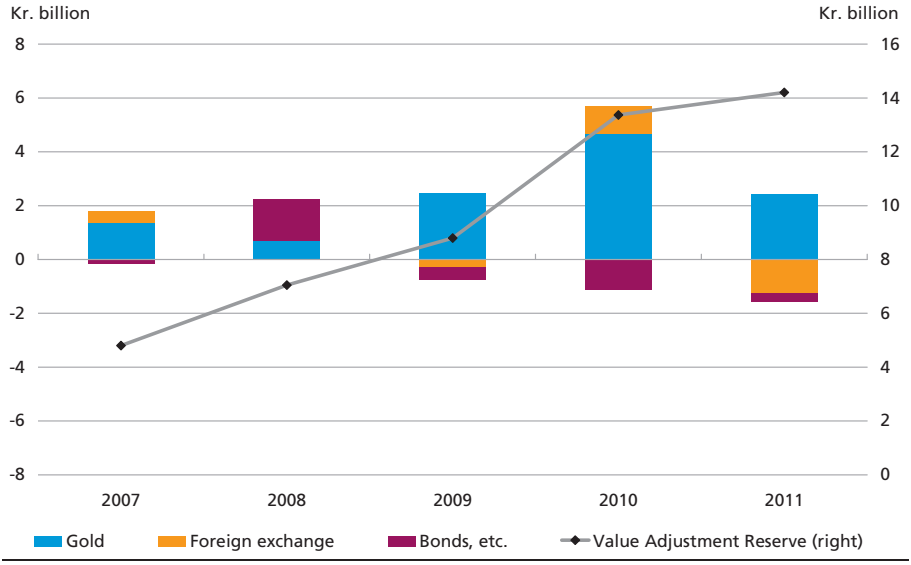
The confidence in Danmarks Nationalbank rests on its undisputed solvency. In consequence, the net capital should be substantial relative to the balance sheet and activities to ensure that the consideration of Danmarks Nationalbank's own earnings does not restrict the implementtation of monetary policy. For a number of years, the distribution of profit has been made with a view to maintaining the General Reserves

---

1 Overall, bonds have yielded a market-price loss in the past few years. However, these negative value adjustments are largely of a technical nature, i.e. mathematical value adjustment (pull to par), which solely reflect the fact that over time bonds move closer to maturity (maturity reduction). When a bond approaches maturity, the price of the bond will usually approach 100. If the coupon rate is higher than the market rate, the price will be higher than 100 and vice versa. The negative value adjustments in recent years reflect that the prices of Danmarks Nationalbank's bond portfolio have typically been above over 100 because the coupon rates are higher than the market rates.

2 The net capital mainly consists of the General Reserves and the Value Adjustment Reserve. To this should be added the General Capital Fund and the Statutory Reserves which, combined, make up less than 1 per cent of Danmarks Nationalbank's total net capital. The General Capital Fund can be seen as a share capital and the Statutory Reserves as a supplement.

VALUE ADJUSTMENT RESERVE Chart 7



Note: The Value Adjustment Reserve is shown as an accumulated figure while the value adjustments on gold, foreign exchange, bonds etc. reflect annual changes.
Source: Danmarks Nationalbank.

at a real level. In other words, the General Reserves generally follow the development in prices.

Danmarks Nationalbank's capital gains and losses may vary considerably. To avoid major fluctuations in payables to the central government, value adjustments are not included in the distribution of profit for the year to the central government but are allocated to the Value Adjustment Reserve. The Value Adjustment Reserve makes up part of net capital and acts as a buffer for profit fluctuations resulting from value adjustments.[1]

The Value Adjustment Reserve has increased considerably during the crisis, cf. Chart 7, mainly due to capital gains on the gold stock. Danmarks Nationalbank is therefore capable of absorbing capital losses of kr. 14 billion without any impact on the amount payable to the central government.

HIGHER FINANCIAL RISKS

Danmarks Nationalbank's risk management is characterised by prudence.[2] However, with a foreign-exchange reserve of close to kr. 500 billion and a

[1] The principles for the amount payable to the central government are described in detail in the Board of Governors' Report in Danmarks Nationalbank (2011).

[2] The general principles for Danmarks Nationalbank's financial management are described in Danmarks Nationalbank (2003). Add to this an annual review of Danmarks Nationalbank's risks, most recently in Danmarks Nationalbank (2011).

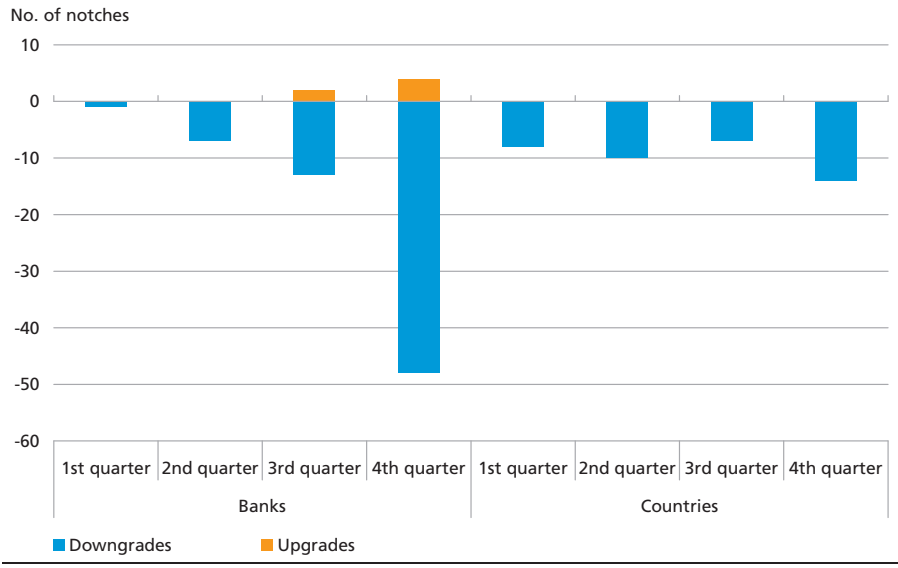
portfolio of Danish bonds of more than kr. 30 billion, Danmarks Nationalbank has had to accept higher financial risks during the crisis, mainly due to the increased risk on the traditional core investments in government bonds issued by euro area member states. This is seen in e.g. Chart 1, which shows the transition from largely no yield spreads to distinct spreads for government bonds issued by euro area member states.

The balancing between various types of risk is not unambiguous. The individual risk factors cannot be viewed separately. Reducing one type of risk often implies increasing another. Moreover, the crisis has shown that the covariation and, hence, the diversification benefit for the various assets change quickly.

Downgrades have increased the concentration of creditworthy counterparties

Prior to the crisis, several assets were considered to be "risk-free" based on credit risk considerations. The risk could be reduced even further by spreading investments to more of these assets. As a result of the crisis, the volume of assets considered to be risk-free has declined. Credit risk has been the focus of attention, and the many downgrades have been a characteristic feature. This was also the case for Danmarks Nationalbank's counterparty banks and investment countries in 2011, cf. Chart 8.

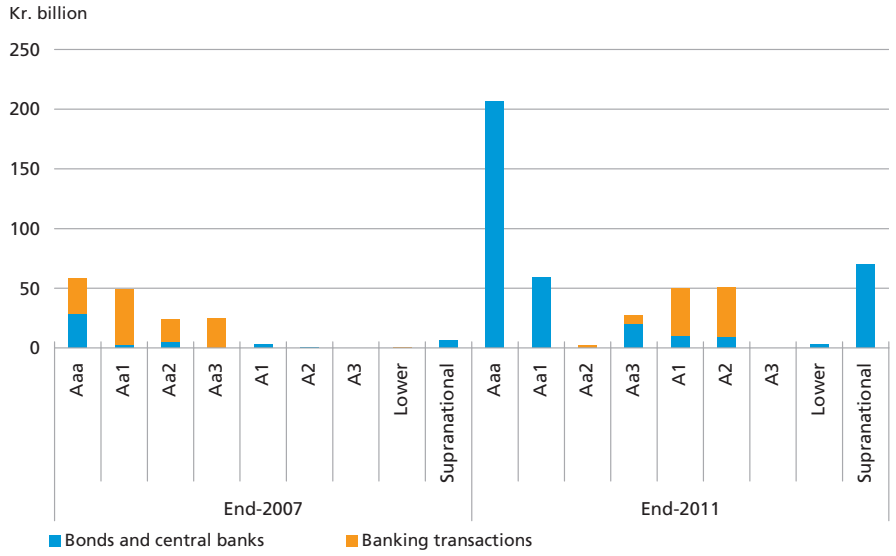
CHANGES IN CREDIT RATINGS OF DANMARKS NATIONALBANK'S COUNTERPARTY BANKS AND INVESTMENT COUNTRIES IN 2011 Chart 8



Note: Changes in credit ratings, by way of grades, of countries and banks from the three major credit rating agencies Fitch, Moody's and S&P. The changes are based on estimates based on Danmarks Nationalbank's current and former counterparty banks.

Source: Fitch, Moody's, S&P and own estimates.

FOREIGN-EXCHANGE RESERVE BROKEN DOWN BY CREDIT RATINGS Chart 9



Note: The categories range from the highest credit rating of Aaa and downwards. Moody's scale has been used. Supranational institutions comprise international institutions such as the Bank for International Settlements, BIS, and the IMF. The data for 2007 only include credit ratings by Moody's while the data for 2011 are the lowest ratings assigned by the three credit rating agencies Moody's, S&P and Fitch.
Source: Moody's, S&P, Fitch and own calculations.

However, the majority of Danmarks Nationalbank's foreign-exchange reserve investments are still made in high-quality assets measured by credit ratings, cf. Chart 9.

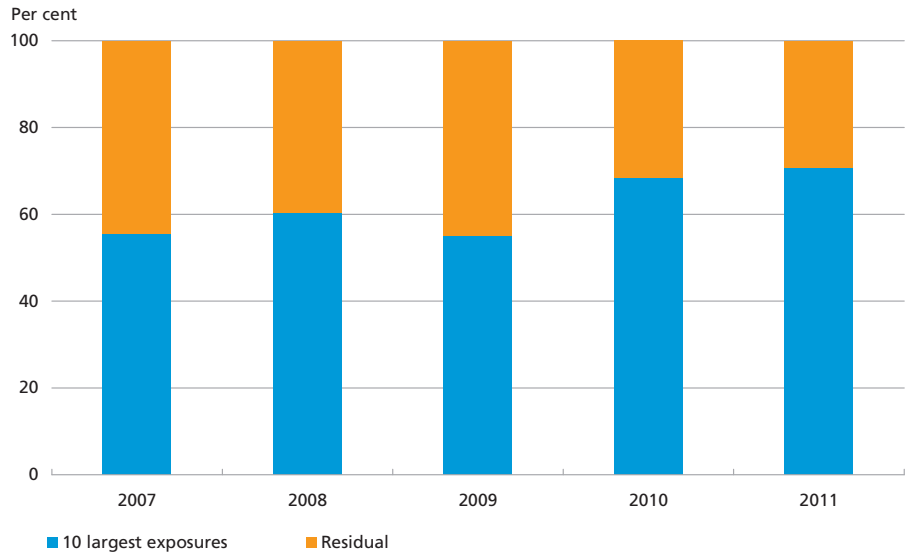
In the case of government bonds which do not have high credit ratings, investments are only made in short-term bonds to reduce the risk of capital losses as a result of interest-rate increases. Moreover, it is not necessary to sell the bonds but merely to keep them to maturity if the aim is to reduce the exposure. Danmarks Nationalbank has investments in Irish and Portuguese government bonds with very short maturities. This reduces the risk and furthermore both countries are comprised by EU-IMF loan programmes.

The many downgrades have entailed that Danmarks Nationalbank has had to increase the concentration of foreign-exchange reserve assets to maintain a high credit quality of its investments, cf. Chart 10. At the end of 2011, the ten biggest exposures made up 71 per cent of the foreign-exchange reserve compared to 56 per cent in 2007. They comprise German, French and US government securities, among others.

Reverse repos are a core business

Reverse repos constitute the core of Danmarks Nationalbank's liquidity reserves. The maturity is short and government issues with a high credit

BREAKDOWN OF FOREIGN-EXCHANGE RESERVE Chart 10



Note: The market value of foreign currency hedging is not included.
Source: Danmarks Nationalbank.

quality are required as collateral.[1] When Lehman Brothers collapsed in 2008, Danmarks Nationalbank had reverse repos of kr. 4.5 billion in that institution. Danmarks Nationalbank subsequently sold the collateral, which consisted of German government bonds, and the entire deposit was recovered. Consequently, Danmarks Nationalbank did not incur any loss. The failure of Lehman Brothers emphasised the importance of high-quality and highly liquid collateral. The sovereign debt crisis has underlined the liquidity and credit risk differences between government bonds issued by the various euro area member states. In consequence, Danmarks Nationalbank has altered its collateral requirements. The quality of the collateral remains high and change of the collateral management has provided Danmarks Nationalbank with the flexibility to adjust the collateral requirements on an ongoing basis.

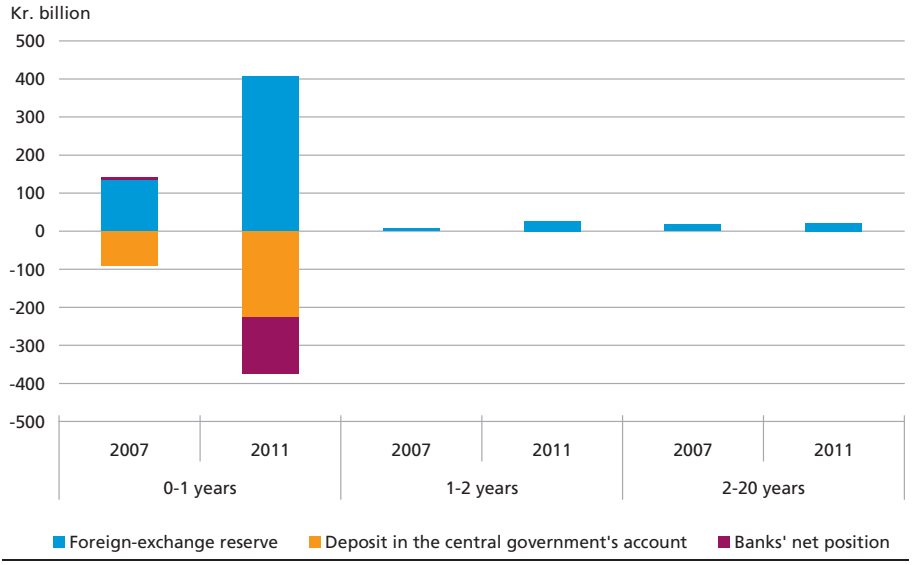
Moreover, bank deposits are only made in major, creditworthy banks.

Larger foreign-exchange reserve and unchanged credit quality have led to higher interest-rate risk

The increase in the foreign-exchange reserve is primarily invested in bonds with a high credit quality. This has led to a higher interest-rate risk, i.e. the risk of capital losses as a consequence of interest-rate rises.

[1] Danmarks Nationalbank has the ownership of the collateral and is therefore in a position to sell it in case of the failure of a counterparty.

SELECTED BALANCE-SHEET ITEMS BY MATURITY Chart 11



Note: The figures are exclusive of gold, FX swaps, etc.
Source: Danmarks Nationalbank.

The risk increase was curbed mainly by purchasing short-term bonds, cf. Chart 11. The bond investments and, hence, the higher interest-rate risk were a necessity; alternatively, the larger reserve would have been invested in the money market without taking on interest-rate risk. In that case, the bank exposure would have increased dramatically.

Danmarks Nationalbank manages the interest-rate sensitivity of the balance-sheet total on the basis of the krone duration[1], which has grown by approximately kr. 1 billion since 2008. At the end of 2011, the krone duration was kr. 2.4 billion. This means that Danmarks Nationalbank would incur a market-price loss of kr. 2.4 billion if all interest rates rose by 1 percentage point.

The krone duration indicates the immediate market-price loss or gain but not long-term earnings. On a 1-percentage-point increase in the general level of interest rates, Danmarks Nationalbank's current interest income would increase by approximately kr. 1 billion in the subsequent year. Conversely, earnings decline in the long term when the level of interest rates declines.

The level of Danmarks Nationalbank's krone duration should be viewed in the context of the historically higher returns on long-term than short-term investments in the long term.[2] Moreover, bonds may be

[1] The krone duration indicates the change in the market value of the portfolio on a 1-percentage-point change in the general level of interest rates.
[2] See Schrøder and Sørensen (2010).

used to counter low earnings caused by continued low interest rates because the longer the term, the higher, often, the yield.

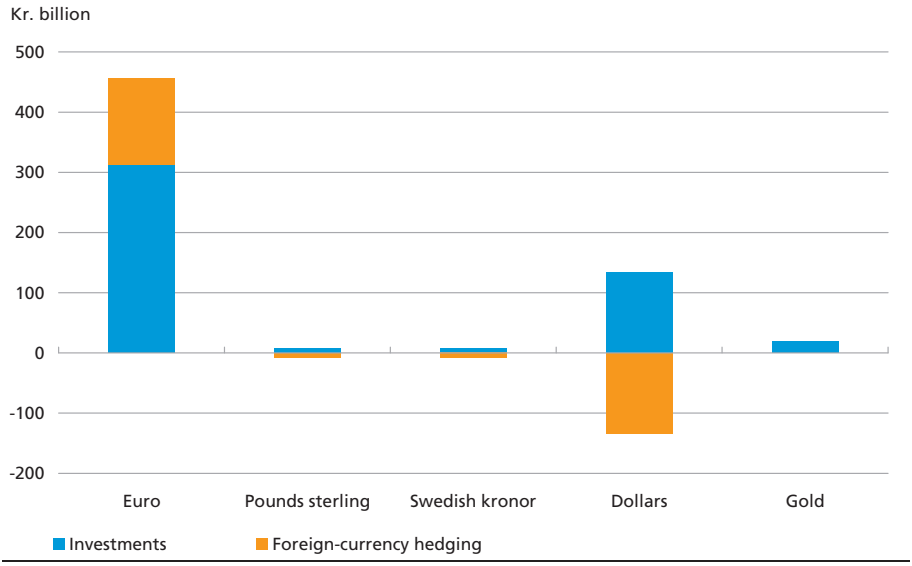
Higher foreign-exchange exposure due to larger reserve and higher value of gold

Most of the foreign-exchange reserve is invested in euro assets. To this should be added a large share of US dollar assets and minor holdings of Swedish kronor and pounds sterling. The exchange-rate risk on investments in non-euro-currencies is swapped to euro via FX swaps. Consequently, Danmarks Nationalbank has foreign-exchange exposures in euro and gold only, cf. Chart 12.

The exchange-rate risk in respect of the euro is low due to the fixed-exchange-rate policy. With a large foreign-exchange reserve, even small fluctuations in the exchange rate of the krone within the fluctuation band may translate into large fluctuations in profit in the individual year. For example, the krone strengthened by 0.3 per cent vis-à-vis the euro in 2011, resulting in a loss of more than kr. 1 billion. Such a loss is a consequence of Danmarks Nationalbank's role as monetary authority.

Danmarks Nationalbank's sensitivity to declining gold prices has increased because the value of the gold stock has more than doubled since 2007.

INVESTMENTS IN FOREIGN EXCHANGE AND FOREIGN CURRENCY HEDGING — Chart 12



Note: The exposure is as at 30 December 2011.
Source: Danmarks Nationalbank.

Liquidity conditions have changed during the crisis

The sovereign debt crisis has meant that liquidity conditions have changed in some markets. Danmarks Nationalbank manages the liquidity by setting up a framework for the amounts it must be able to release within a given time frame. The purpose of the liquidity framework is to provide Danmarks Nationalbank with considerable funds for intervention in the foreign-exchange market even when the krone is under pressure.

QUANTIFICATION OF RISK

Danmarks Nationalbank's aggregate risk has grown during the crisis due, in part, to a larger foreign-exchange reserve and intensified market turmoil. To this should be added a lower credit quality measured by credit ratings.

The credit risk has increased but it is difficult to quantify, especially because actual credit losses on assets with high credit ratings are rare. In the case of government bonds, there are very few examples of defaults in recent times. The current crisis in the euro area makes it difficult to reasonably quantify the credit risk of assets with lower credit ratings. However, Danmarks Nationalbank's holdings of government bonds with lower credit quality is very small and short-term.

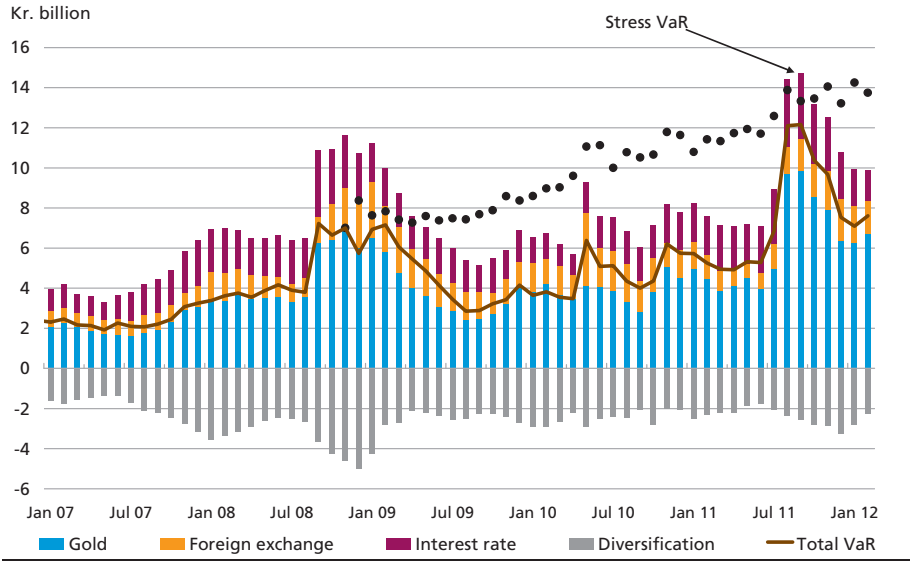
As opposed to credit risk, more data is available for quantifying risks resulting from fluctuations in market factors such as exchange rates and interest rates, i.e. market risk. Danmarks Nationalbank's market risk is measured by Value-at-Risk, VaR. VaR combines the exposure to various risk factors with an estimate of volatility.[1]

At the end of February 2012, VaR was kr. 7.6 billion, cf. Chart 13, meaning that under the given assumptions Danmarks Nationalbank can incur a maximum annual market-price loss of kr. 7.6 billion in 19 out of 20 years.

VaR cannot be seen in isolation since it tends to underestimate tail events. Danmarks Nationalbank therefore complements the VaR measure with Stress VaR, i.e. VaR calculated for the relevant portfolio but with the stressed market conditions prevailing in the autumn of 2008. For some periods in the summer and autumn of 2011, the ordinary VaR was close to the high level of Stress VaR, testifying to the market turmoil during the sovereign debt crisis.

[1] The VaR measure allows for the fact that the covariation of risk factors typically results in a diversification gain, i.e. not all factors produce a loss at the same time. Variation estimates are based on historical observations for the past 160 days with the latest observation being the most significant. VaR indicates the calculated maximum market-price loss Danmarks Nationalbank can incur in 19 out of 20 years.

DANMARKS NATIONALBANK'S VALUE-AT-RISK, END OF MONTH Chart 13



Source: RiskManager and own calculations.

The stock of gold accounts for a large share of VaR, and the share has grown in step with the increase in the value during the crisis. For example, at the end of February 2012, VaR excluding gold would have been kr. 5.5 billion lower than VaR including gold.

The quantification of market risk using VaR contributes to better understanding of the Danmarks Nationalbank's aggregate risks. There is no explicit compliance framework for VaR since a large share of VaR can be attributed to Danmarks Nationalbank's role as monetary authority. VaR forms part of Danmarks Nationalbank's decision on the overall framework to assess the sensitivity to market factors.

LITERATURE

Danmarks Nationalbank (2011), *Report and accounts*.

Danmarks Nationalbank (2003), *Financial management at Danmarks Nationalbank, December.*

Danmarks Nationalbank (2009), *Monetary policy in Denmark*, 3rd edition, September.

Danmarks Nationalbank (2010), The Danish krone during the crisis, speech by Governor Nils Bernstein at Copenhagen Business School, 22 March.

BIS (2011), Why central bank balance sheets matter, speech by Jaime Caruana, General Manager of the BIS, at the Bank of Thailand-BIS conference, 12 December.

Jensen, Thomas Krabbe and Christian Stampe Sørensen (2010), The increase in the price of gold in recent years, Danmarks Nationalbank, *Monetary Review*, 1st Quarter.

Jørgensen, Anders, Carina Moselund Jensen, Paul Lassenius Kramp and Lars Risbjerg (2011), The money and foreign-exchange markets during the crisis, Danmarks Nationalbank, *Monetary Review*, 2nd Quarter, Part 2.

Schrøder, Søren and Christian Stampe Sørensen (2010), Do long-term bonds offer a higher return than short-term bonds?, Danmarks Nationalbank, *Monetary Review*, 2nd Quarter.

Stone, Mark, Kenji Fujita and Kotaro Ishi (2011), Should unconventional balance sheet policies be added to the central bank toolkit? A review of the experience so far, *IMF Working Papers*, No. 145, June.

Liquidity of Danmarks Nationalbank and the Banks

Lars Risbjerg, Economics, and Thomas Sangill, Financial Markets

INTRODUCTION AND SUMMARY

Typically, bank liquidity contracts in times of financial crisis. Banks find it increasingly difficult to raise loans in the money and capital markets because confidence in the financial system is diminishing and financial market liquidity is declining. A shortage of liquidity in the banking sector may lead to financial instability and to systemic crises with severe adverse consequences for the real economy.

It is a core central-bank task to ensure that banks have access to sufficient liquidity. During a financial crisis, when banks have difficulties obtaining loans due to dysfunctional money and capital markets, central banks may step in to support bank liquidity e.g. by increasing lending. Therefore, amid financial crises, part of the banks' normal placement and borrowing activities in the money and capital markets may instead be conducted with the central bank.

Since 2008 and in order to promote financial stability, Danmarks Nationalbank – like a number of other central banks – has taken various steps to support the banks' liquidity. Most recently, Danmarks Nationalbank has introduced two separate measures. Firstly, the collateral basis has been expanded to include the banks' credit claims of good quality. Secondly, Danmarks Nationalbank's credit facilities have been expanded to include 3-year loans secured by Danmarks Nationalbank's entire collateral basis. The measures are aimed at improving the banks' access to liquidity and ease the transition when the individual government guarantees expire in 2012-13. Furthermore, in 2011 Danmarks Nationalbank introduced 6-month loans and temporarily expanded its collateral basis to include shares in the companies jointly owned by the banks.

All banks may use these measures and there is no limit to the amount they can borrow from Danmarks Nationalbank. This offers the banks maximum security in terms of obtaining the liquidity they want in times of generally difficult financing conditions and supports confidence in the banks to the best possible extent.

Danmarks Nationalbank's most recent measures are aimed at the banks' liquidity, meaning their ability to raise funding. Danish monetary policy normally focuses on liquidity in the form of banks' demand deposits with Danmarks Nationalbank.

WHAT IS LIQUIDITY?

A bank's liquidity may be defined as its ability to make payments whenever they are required. The definition relates to the ability to obtain funding and the concept is normally referred to as funding liquidity. This type of liquidity is closely related to market liquidity, cf. Box 1 on various liquidity concepts and their interaction. The funding possibilities available to a bank largely depend on liquidity conditions and risk premia in the financial markets. This applies to both issuance of new debt instruments and sales of assets.

In times of ample market liquidity and easy access to market funding, liquidity in the financial system is for the most part provided via banks and other market players. Thus, the level of liquidity depends on the level of trust among market players and the liquidity conditions in the financial markets, cf. Domanski et al. (2011). When banks are confident that they can obtain sufficient funding, they become more inclined to grant loans and create liquidity. If the creation of liquidity among private market players comes to a halt, central banks may step in by expanding the banks' credit facilities at the central bank. The central bank can determine loan terms independently of the level of confidence among the private market players.

It is a core central-bank task to ensure a sufficient supply of liquidity in the financial system. In times of crisis, when market confidence and liquidity may deteriorate significantly, it is vital that the central banks ensure that the banks are able to obtain enough liquidity. Therefore, part of the banks' normal placement and borrowing activities in the money and capital markets may instead be conducted with the central bank.

CENTRAL-BANK MEASURES TO SUPPORT LIQUIDITY

Since the onset of the financial crisis, numerous central banks have introduced a number of extraordinary measures to increase confidence among banks that they will be able to obtain the liquidity they need.

The central banks have, among other things, increased the supply of longer-term loans and expanded their collateral basis as well as the number of counterparties with access to central-bank instruments.

LIQUIDITY CONCEPTS[1] Box 1

Funding liquidity

Funding liquidity is an expression of the ability to make payments when needed. The Basel Committee on Banking Supervision, BCBS, defines a bank's funding liquidity as its ability to fund increases in assets and meet obligations as they come due without incurring unreasonably heavy losses, cf. BCBS (2008). As indicated by the definition, banks' funding liquidity relates to their entire balance sheet.

On the assets side, banks may use their liquidity buffers. They may, for instance, draw on demand deposits with other banks or the central bank, or they may sell securities. On the liabilities side, banks may raise loans in the money and capital markets or directly from the central bank.

Market liquidity

Market liquidity is an expression related to an asset. A high level of market liquidity reflects the possibility of trading large amounts in a financial asset quickly without any significant price effect. By contrast, a low level of market liquidity means that trading affects prices even where the amounts involved are limited.

Relationship between funding and market liquidity

Funding liquidity and market liquidity are closely linked. When the market liquidity of assets held by a bank falls, the possibility of obtaining funding liquidity by selling or pledging assets as collateral diminishes. Funding liquidity may also affect market liquidity. If funding liquidity for key participants in the financial markets deteriorates, their capacity to operate in the financial markets also deteriorates, and consequently market liquidity is reduced. This may give rise to negative liquidity spirals in times of crisis when negative shocks to funding liquidity, e.g. from loss of confidence in the financial sector, reduce market liquidity, which in turn means lower funding liquidity, and so forth.

Central-bank liquidity

Central-bank liquidity is the banks' demand deposits with the central bank and may be readily applied in settlement of payments. Central-bank liquidity is included in the banks' funding liquidity. The banks' demand for central-bank liquidity is associated with the fact that these claims on the central bank are accepted as risk free and can always be used to settle outstanding balances among banks and between banks and the central bank.

The banks' access to central-bank credit is essential to the availability of central-bank liquidity. Overall, the volume of central-bank liquidity available to the banks is limited to that provided by the central bank. The banks can trade central-bank liquidity among themselves, but they cannot create central-bank liquidity.

[1] See e.g. Nikolau (2009) for an overview of liquidity concepts, and Brunnermeier and Pedersen (2009) for a discussion of the relationship between funding and market liquidity.

Access to *longer-term loans* offers banks enhanced certainty as regards the liquidity situation over a longer period of time. This may be relevant when banks require longer-term funding, and when their

general access to funding liquidity is uncertain. In December 2011 and in light of the debt crisis, the European Central Bank, ECB, introduced a number of measures to support liquidity, including 3-year loans, cf. Box 3 in Current Economic and Monetary Trends in this Monetary Review. Demand for ECB 3-year loans has been significant, and one Danish bank with units in the euro area has declared that it has raised 3-year loans from the ECB. Analyses prepared by the ECB indicate that banks have primarily raised the loans for funding purposes, and that the loans have facilitated access to funding for the real economy amid the debt crisis, cf. ECB (2012). The banks may include 3-year loans in their funding and thus avoid a considerable and constant need for refinancing, as would otherwise have been the case with short-term monetary-policy loans. The 3-year loans may therefore underpin bank liquidity in the medium term.

A *wide and extensive collateral basis* with respect to central-bank lending facilitates bank funding in the event that market funding becomes less accessible.

In times of generally difficult funding conditions for the banks, *broad-based access to central-bank liquidity facilities* will mitigate uncertainty as regards funding liquidity. Furthermore, equal access for all banks irrespective of their financial position and systemic importance will alleviate further uncertainty as regards counterparty credit and liquidity conditions. Cecchetti and Disyatat (2010) analyse the options available to central banks to support liquidity in various situations. In times of a broad-based liquidity shortage, they recommend a general scheme available to all monetary counterparties.

The central banks' extraordinary measures reassure the banks of the availability of liquidity. The measures support loan-market activity because they reassure the lender that it will receive liquidity again. Moreover, the possibility of raising liquidity from the central bank strengthens borrowers' bargaining position in the money and capital markets. Thus, the central banks support the creation of liquidity by market players by signalling willingness to provide liquidity. In other words, the extraordinary measures introduced by the central banks may improve the banks' funding liquidity even when the banks do not actively make use of the measures.

Several of the central-bank measures are temporary and some have already been phased out. To support smoothly functioning markets it is important that banks operate on market terms in normal times. Traditionally, a market solution supports efficient liquidity management by banks and efficient pricing in the money and capital markets.

DANMARKS NATIONALBANK'S MONETARY-POLICY INSTRUMENTS AND MEASURES TO SUPPORT LIQUIDITY

Danmarks Nationalbank's accounts with the banks are managed via monetary-policy instruments, i.e. the lending and deposit facilities that Danmarks Nationalbank makes available to the monetary-policy counterparties, cf. Box 2.

Danish monetary-policy instruments are designed primarily to support the fixed-exchange-rate policy. This implies that changes in Danmarks Nationalbank's interest rates must be clearly reflected in short-term money-market rates, which determine the krone rate. Consequently, the instruments must also support a smoothly functioning money market in which liquidity in the financial system is distributed efficiently on market terms, and money-market rates reflect official interest rates. Moreover, the instruments must support a stable financial system, including a secure settlement of payments. This is enshrined in section 1 of the Danmarks Nationalbank Act, stating that Danmarks Nationalbank has the responsibility "…to maintain a safe and secure currency system in this country, and facilitate and regulate the traffic in money and the extension of credit".

MONETARY-POLICY COUNTERPARTIES AND COLLATERAL BASIS — Box 2

Danmarks Nationalbank's monetary-policy counterparties are banks and mortgage banks operating pursuant to the Danish Financial Business Act. In addition, Danmarks Nationalbank also gives Danish branches of foreign credit institutions with corresponding activities access to the monetary-policy instrumnents.

As a general rule, Danmarks Nationalbank offers monetary-policy counterparties access to credit in Danish kroner against collateral in the following securities:

- Securities issued by the Kingdom of Denmark
- Bonds guaranteed by the Kingdom of Denmark
- Bonds issued by KommuneKredit and Danish Ship Finance
- Mortgage bonds and covered bonds
- Senior debt in relation to covered bonds meeting a rating requirement
- Bonds issued by Føroya Landsstýri (the Faroese government)

The monetary-policy counterparties may pledge their own mortgage bonds and covered bonds as collateral, as these bonds will be given preferential treatment over the underlying collateral in the event of insolvency.

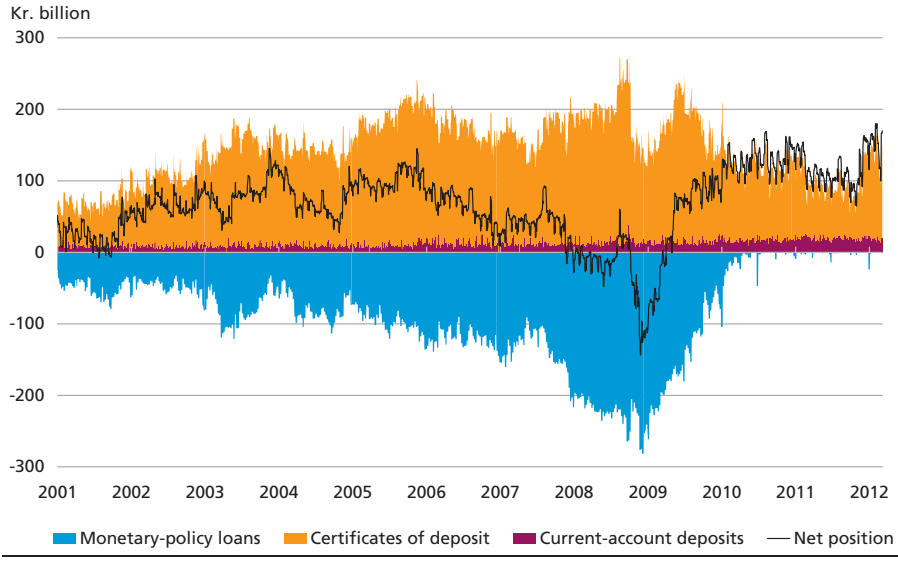
In addition, since October 2011 banks have, as a general measure, been allowed to pledge their own credit claims of good quality. Moreover, in August 2011 the collateral basis was temporarily expanded to include shares in the companies jointly owned by the banks (sector shares). Furthermore, government-guaranteed issuance by banks and mortgage banks and SPV bonds issued on the basis of such issuance may be temporarily pledged to Danmarks Nationalbank.

Danmarks Nationalbank's provision of central-bank liquidity

Danmarks Nationalbank's most recent measures have targeted the banks' access to funding. Danish monetary policy normally focuses on liquidity in the form of demand deposits at the current accounts held with Danmarks Nationalbank by the monetary-policy counterparties, i.e. central-bank liquidity or current-account liquidity. Current-account liquidity may be readily applied towards the settlement of interbank payments and payments to the central bank. By providing current-account liquidity, Danmarks Nationalbank ensures adequate liquidity in the financial system for smooth and secure settlement of payments. To restrict the amount of funds otherwise available for speculation against the krone, a limit has been imposed on the total current-account deposits held by the counterparties.

Danmarks Nationalbank provides liquidity to the financial system via weekly regular open market operations. Liquidity is allotted via lending against collateral, and liquidity is absorbed by selling certificates of deposit. To the necessary extent, Danmarks Nationalbank will conduct extraordinary open market operations to manage liquidity by purchasing and selling certificates of deposit. This gives the counterparties an opportunity to obtain liquidity by selling certificates of deposit through Danmarks Nationalbank's open market operations, and they exchange liquidity in the money market. Furthermore, the counterparties may

BORROWING AND DEPOSITS BY BANKS AND MORTGAGE BANKS AT DANMARKS NATIONALBANK — Chart 1



Note: The net position is the sum of certificates of deposit and current-account deposits less monetary-policy loans.
Source: Danmarks Nationalbank.

trade certificates of deposit among themselves and use them as collateral at Danmarks Nationalbank. Danmarks Nationalbank's monetary-policy instruments give the banks a high degree of flexibility in terms of obtaining collateralised liquidity. All monetary-policy counterparties have access to the open market operations and can freely decide the volume of monetary-policy loans at the lending rate determined by Danmarks Nationalbank.

Today, the monetary-policy counterparties' overall have a liquidity surplus vis-à-vis Danmarks Nationalbank and thus a need for placement of liquidity with Danmarks Nationalbank. They only occasionally and to a very limited extent raise loans at Danmarks Nationalbank, cf. Chart 1. During the financial crisis, the counterparties increased their loans from as well as deposits with Danmarks Nationalbank until end-2008. The majority of deposits were in the form of certificates of deposit. As mentioned above, these may be converted into current-account liquidity in the open market operations, constituting a liquidity reserve for the counterparties, cf. Dam and Risbjerg (2009) and Jensen et al. (2010).

Danmarks Nationalbank's measures to support liquidity

In order to safeguard financial stability, Danmarks Nationalbank has since 2008 taken various steps to support bank liquidity. Most recently, two separate measures have been introduced.

Firstly, the collateral basis has been expanded to include the banks' own credit claims of good quality. Furthermore, the banks can temporarily borrow against shares in the companies that they own jointly. The expanded collateral basis may be used for all types of loans with Danmarks Nationalbank and ranks equally with the remaining collateral basis without quantitative restrictions or interest premia. At the time of the announcement of the scheme, the collateral value of the banks' own credit claims was estimated at kr. 400 billion. The actual value will be lower, partly because some of the credit claims have been pledged to other creditors or are subject to contractual terms preventing them from being pledged to Danmarks Nationalbank. Moreover, the collateral value should be adjusted for the debtor's full entitlement to offset claims. Whereas some banks may find it attractive to pledge credit claims to Danmarks Nationalbank, others may find that having the option is enough. The option to borrow *per se* makes it easier for the banks to obtain refinancing on market terms as it reduces the risk of liquidity problems.

Secondly, Danmarks Nationalbank has introduced a temporary 3-year credit facility, which will be offered on 30 March and 28 September 2012. Danmarks Nationalbank uses an open window, in line with its other lending. This means that banks and mortgage banks can freely de-

cide the volume of loans. Loans may be secured by Danmarks Nationalbank's entire collateral basis. The rate of interest is variable and follows Danmarks Nationalbank's 7-day monetary-policy lending rate plus an interest premium. Until 31 July 2013 the interest premium is zero, and the rate of interest therefore equals the 7-day rate. If, after that time, Danmarks Nationalbank finds that access to funding in the money and capital market has normalised, the interest premium will be increased. Loans may be prematurely redeemed in part or in full on a weekly basis, at the earliest six months after being raised.

Furthermore, in October 2011 Danmarks Nationalbank introduced a 6-month facility. Monetary-policy counterparties may raise collateralised 6-month loans at a variable rate of interest equal to Danmarks Nationalbank's lending rate in the weekly open market operations. The facility is open on the last Friday of every month. So far, only kr. 0.1 billion has been drawn on the facility; on the last Friday of February 2012.

THE BANKS' LIQUIDITY

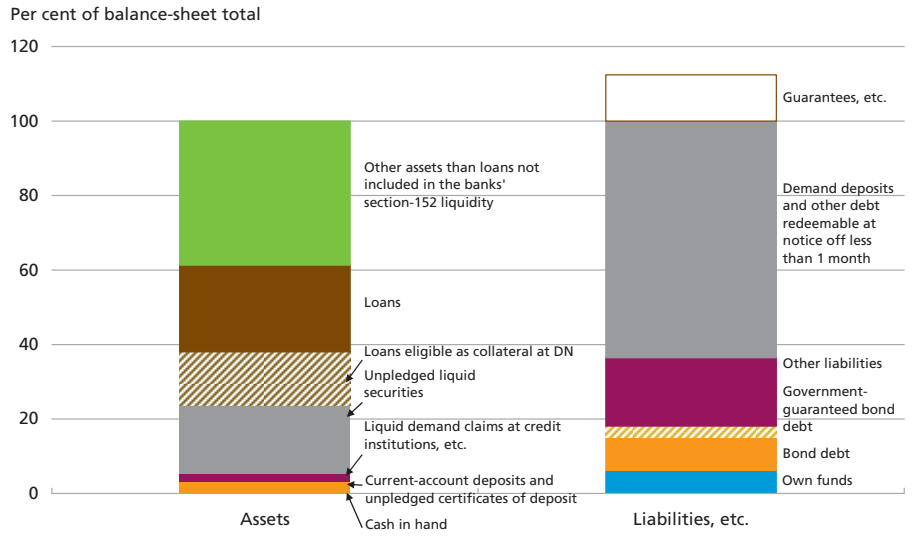
The banks' liquidity may be described on the basis of their balance sheets, where assets may be broken down according to market liquidity and liabilities according to maturity, cf. Chart 2.[1] The banks' liquidity management is described in more detail in Rasmussen (2010).

The more liquid the assets, the easier it is to raise liquidity by selling them. Another option to raise liquidity via assets is by pledging them as collateral for loans. Close to 25 per cent of the banks' total assets are sufficiently liquid to allow the banks to include them in the calculation of their statutory liquidity, otherwise referred to as section-152 liquidity in the Danish Financial Business Act. The balance-sheet composition of individual banks varies considerably, however. Current-account deposits with Danmarks Nationalbank and unpledged certificates of deposit account for about 13 per cent of the banks' section-152 liquidity. The option to pledge credit claims of good quality to Danmarks Nationalbank is similar to a buffer of liquid assets. Thus, it is only natural that, within certain limits determined by the Danish Financial Supervisory Authority, the banks may include access to loans at Danmarks Nationalbank when calculating their statutory liquidity, cf. Box 3.

The longer the maturity of the liabilities, the less the need for raising liquidity on an ongoing basis to refinance them. Basically, the contractual term to maturity of the banks' liabilities is short, as the majority com-

[1] In the following, banks include the Danish Financial Supervisory Authority's groups 1-3 including foreign branches. Banks transferred to the Financial Stability Company are not included.

BANKS' BALANCE-SHEET STRUCTURE END-2011 Chart 2



Note: Stated at end-December 2011. Loans that may be pledged to Danmarks Nationalbank are estimated at the time of the introduction of the scheme. The Danish Financial Supervisory Authority's guideline limits are not included. The chart includes the Danish Financial Supervisory Authority's groups 1-3 including foreign branches. Banks transferred to the Financial Stability Company are not included.

Source: Liquidity reports from the banks to the Danish Financial Supervisory Authority and Danmarks Nationalbank as well as own calculations.

prises demand deposits and other debt with a period of notice shorter than one month. Requirements for bank liquidity take into account the term to maturity of the liabilities, cf. Box 3.

The banks' loans at Danmarks Nationalbank are also included on the liabilities side of their balance sheets. By end-2011, however, the banks had almost no loans with Danmarks Nationalbank , cf. Chart 2.

Given the current market conditions, the possibility that small and medium-sized banks in particular will be able to obtain new funding liquidity by issuing bonds is slim, cf. Danmarks Nationalbank (2012). In the coming years, the banks face major bond redemptions, a large part of which were issued with individual government guarantees. Issued bonds without government guarantees account for close to 10 per cent of the banks' total assets, whereas bonds with government guarantees account for approximately 3 per cent, cf. Chart 2. For some banks, however, the ratio is significantly higher.

Danmarks Nationalbank's 3-year loans offer the banks an opportunity to obtain long-term funding, even if this is not possible in the market. The banks can thus include the 3-year loans in their funding plans, using the loans as a transition to a situation without government-guaranteed bonds, when the latter mature in 2012 and 2013. In addition, the 3-year

SECTION-152 LIQUIDITY REQUIREMENTS AND FUNDING RATIO Box 3

Pursuant to section 152 of the Danish Financial Business Act, a bank shall have appropriate liquidity comprising cash in hand, current-account deposits and unpledged demand deposits, fully secured and liquid demand deposits with credit institutions and insurance companies, etc. and liquid securities not used as collateral for a loan. In addition, the credit facility based on loans that can be pledged to Danmarks Nationalbank may be included within certain limits. The bank's portfolio of liquid assets must at least constitute the higher of:

- 15 per cent of the debt exposures that, irrespective of possible payment conditions, shall be payable by the bank on demand or are redeemable at less than 1 month's notice, or
- 10 per cent of the total debt and guarantee exposures of the bank, less subordinated debt that may be included in calculations of the capital base.

The liquidity requirement is supplemented with the supervisory diamond, which was introduced by the Danish Financial Supervisory Authority in 2010. The supervisory diamond defines a benchmark for excess liquidity coverage of at least 50 per cent of the minimum requirement.

The supervisory diamond also introduces a measure for stable funding, known as the funding ratio. The aim is for banks to achieve a funding structure comprising funding sources with longer maturities.

The funding ratio reflects the relation of lending on the one hand and working capital less bonds maturing in less than 1 year on the other,

$$\frac{\textit{Lending}}{\textit{Working capital - bonds maturing in less than 1 year}} < 1$$

where working capital comprises deposits, issued bonds, subordinate loan capital and equity capital. As from 1 January 2012, banks may also include loans raised at Danmarks Nationalbank with a remaining term to maturity of more than 1 year.

With effect from end-2012, non-observance of the limit values of the supervisory diamond may result in a supervisory response. For example, the Danish Financial Supervisory Authority may give the bank risk information (i.e. draw the bank's attention to special risks in connection with its operations), which is to be published. A supervisory response will, however, always be based on a specific, individual assessment and does not automatically go hand in hand with non-observance of the limit values.

loans may be included in the banks' funding without creating a substantial, ongoing need for refinancing, which would otherwise have been the case with short-term monetary-policy loans. Furthermore, the banks can include the 3-year loans in the Danish Financial Supervisory Authority's funding ratio, cf. Box 3.

Incentive for efficient liquidity management

While it is a core central-bank task to ensure a sufficient liquidity supply in times of crisis, it is also decisive that the banks remain highly resilient

to liquidity shocks. Internationally, steps are being taken to establish new liquidity requirements that will, in time, improve bank resilience to liquidity shocks. A new requirement in the form of a Liquidity Coverage Ratio, LCR, is expected to be implemented in 2015. The new requirement will ensure that banks operate with adequate high-quality liquidity buffers to resist short-term liquidity shocks. A stable funding requirement, Net Stable Funding Ratio, NFSR, is also on the drawing board. Furthermore, with the introduction of the supervisory diamond applicable from end-2012, the Danish Financial Supervisory Authority has defined national guiding points for bank liquidity management, which will in future improve their resilience to liquidity shocks, cf. Box 3.

LITERATURE

Basel Committee on Banking Supervision, BCBS (2008), *Principles for sound liquidity management and supervision*, September.

Brunnermeier, Markus K. and Lasse H. Pedersen (2009), Market liquidity and funding liquidity, *Review of Financial Studies*, Vol. 22, No. 6.

Cecchetti, Stephen G. and Piti Disyatat (2010), Central bank tools and liquidity shortages, FRBNY, *Economic Policy Review*, August.

Dam, Niels Arne and Lars Risbjerg (2009), Central-bank measures and balance sheets during the crisis, Danmarks Nationalbank, *Monetary Review,* 4th Quarter.

Danmarks Nationalbank (2012), *Stress tests,* 2nd half, 2011.

Danmarks Nationalbank (2012), Current economic and monetary trends, *Monetary Review*, 1st Quarter.

Domanski, Dietrich, Ingo Fender and Patric McGuire (2011), Assessing global liquidity, BIS, *Quarterly Review*, December.

ECB (2012), The impact of the first three-year longer-term refinancing operation, *Monthly Bulletin,* January, Box 4.

Jensen, Carina Moselund, Anders Jørgensen, Paul Lassenius Kramp and Lars Risbjerg (2010), The money and foreign-exchange markets during the crisis, Danmarks Nationalbank, *Monetary Review*, Part 2, 2nd Quarter.

Nikolaou, Kleopatra (2009), Liquidity (risk) concepts definitions and interactions, *ECB Working Paper Series*, No. 1008, February.

Rasmussen, Anne-Sofie Reng (2010), Banks' liquidity management, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter.

Pension Savings

Paul Lassenius Kramp, Economics, Jane Lee Lohff, Market Operations and Jens Pagh Maltbæk, Statistics

INTRODUCTION AND SUMMARY

The Danish pension system may be divided into three pillars: tax-funded pensions (e.g. state retirement pension), mandatory pensions (e.g. labour-market pensions) and voluntary, savings-based pensions. The pension system has undergone changes, reflected in constant growth in savings-based pension schemes – a trend that will continue over the coming decades. Pension savings have become a key component in private sector financial balance sheets, with a major impact on the Danish capital market.

With the expansion of a savings-based system, contributions and pay-outs under savings-based pension schemes have soared. In 1984, about 4 per cent of average wages were paid into to a pension scheme. In 2010, the figure was almost 11 per cent. Payouts under savings-based pension schemes rose from approximately 15 per cent of total pension payouts in 1984 to about 35 per cent in 2010. When the pension system has fully matured, this share is estimated to be around 50 per cent.

The combination of large net contributions, accumulated returns and capital gains means that household pension wealth has doubled over the last 15 years, reaching 142 per cent of the gross domestic product, GDP, at year-end 2010. This is reflected in substantial expansion of household balance sheets, with increased assets and liabilities. Based on a stylised projection in Dream, household pension wealth is estimated to increase by a further 60 per cent of GDP over the next three decades. Viewed in isolation, this would indicate that household gross debt will increase further over the coming years, as households must be expected to include the size of their pension savings in their considerations of the rate of repayment of housing debt, etc.

The pension sector has become one of the key players in the Danish financial markets due to the massive pension wealth held by pension companies. For instance, the pension sector holds about 50 per cent of Danish government securities and more than 30 per cent of Danish mortgage debt.

The European sovereign debt crisis caused financial market anomalies, reflected in declining interest rates, greater volatility and pressure on

the financial buffers of pension companies, among other factors. This turn of events could trigger a snowball effect, with declining interest rates leading to abnormal pressure on the demand for Danish bonds, which would, in turn, exert further downward pressure on interest rates. This could have negative implications for pension savers. Therefore, parts of the regulation were adapted; for instance the discount curve was changed in late 2011.

THE DANISH PENSION SYSTEM

The Danish old-age pension system comprises three pillars: tax-funded pensions (e.g. state retirement pension), mandatory savings-based pensions (e.g. labour-market pensions) and voluntary savings-based pensions.

First pillar, tax-funded pensions

This pillar comprises e.g. state retirement pension, early retirement benefits and civil servant pensions. The common denominator of these pensions is that they are funded mainly through current tax income and supplementary early retirement contributions. In other words, since no pension wealth is involved, the size of these pensions has no direct financial market impact.

Second and third pillars, savings-based pensions

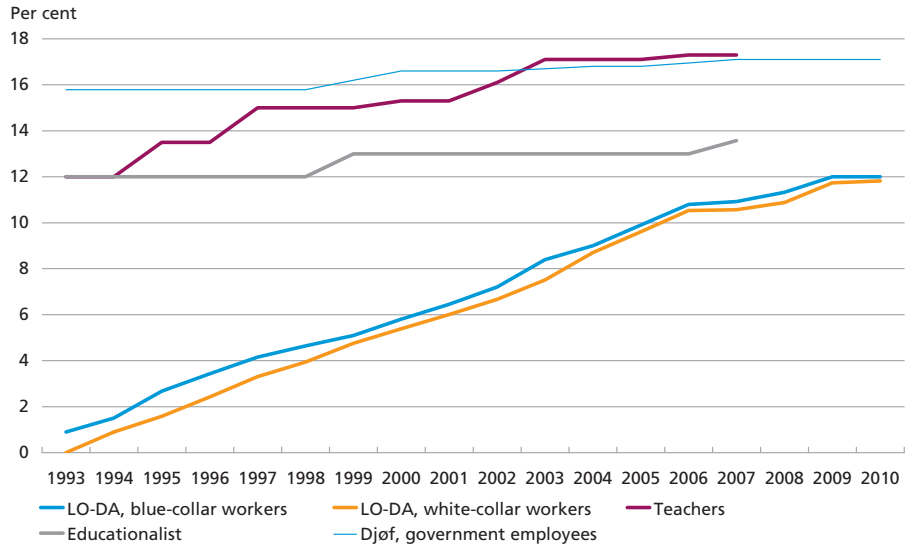
Today, most wage earners contribute to a labour-market pension, i.e. a savings-based pension. These pension schemes were introduced to various trade and professional groups at different times, but the general trend was for labour-market pensions to be introduced first to the white-collar segments, which had the widest gaps between pre-retirement income and state retirement pension benefits. In the late 1980s, labour-market pensions and the size of contributions became part of the collective agreements covered by Danish Confederation of Trade Unions (LO) and the Confederation of Danish Employers (DA), with differences from one segment to the next. The pension contributions paid were managed by the wage earners' new pension funds.

Danish politicians supported this development – e.g. because it would narrow the gap between pre-retirement income and the sum of state retirement pension and labour-market pension, thereby reducing the pressure for increased public spending in this field.

The size of contribution rates[1] for labour-market pensions is part of the collective agreements between the social partners in individual col-

[1] See the note to Chart 1 for a definition of contribution rates.

LABOUR-MARKET PENSION CONTRIBUTION RATES Chart 1



Note: Contribution rates are the rates agreed under collective agreements. In the chart, these rates are calculated using the net method, i.e. the contribution ratio is calculated as the percentage of the wage earner's pay (including tax and labour-market contributions) excluding own pension contribution.
Source: Economic Councils (2008).

lective bargaining areas. For large groups of wage earners, the contribution rate has been rising for the last almost 20 years, cf. Chart 1. If contributions are seen in relation to total payroll expenditure, the result is an aggregated contribution rate, which rose from approximately 4 per cent in 1984 to almost 11 per cent in 2010.

Close to 90 per cent of the Danish population aged 16-66 contributes to the Danish Labour Market Supplementary Pension Scheme, ATP, a statutory savings-based pension scheme for wage earners and the unemployed.[1] In addition, the self-employed and others contribute to private savings-based pension schemes.

Pension savings differ from other savings in being targeted at retirement. Consequently, these savings are typically tied up[2] until retirement and they are tax-advantaged, e.g. the capital yield on pension schemes is taxed at a rate of 15.3 per cent, while the yield on free financial savings is taxed at a higher rate as capital income (between 25 and 50 per cent depending on the composition of income).[3] Moreover, contributions are fully deductible, while payouts are taxed as income.[4] If the income tax

1 Cf. ATP (2008).
2 Certain types of pension schemes may be disbursed before retirement against payment of additional tax. Early payouts are usually taxed at a rate of 60 per cent.
3 The rate of pension yield tax has temporarily been raised from 15.0 to 15.3 per cent in 2012 and 2013.
4 The tax deductibility of certain pension types, e.g. capital pensions and annuity pensions, is capped.

PENSION CONTRIBUTORS, AGE GROUP 30-55 Table 1

Number of persons/per cent of the age group	1988	1995	2005
	Number		
Labour-market pension	671,063	1,041,560	1,337,769
Private pension scheme	560,694	675,297	620,314
At least one pension scheme	1,019,283	1,320,615	1,505,239
		Per cent	
Labour-market pension	37	56	69
Private pension scheme	31	36	32
At least one pension scheme	56	71	77

Note: Civil servants are not included. Exclusive of ATP contributions. The number of persons holding a pension scheme is higher than the number contributing in any given year. The reason is that no contributions are paid e.g. during unemployment spells. Hence, the prevalence of pension schemes is higher than the table shows.
Source: Economic Councils (2008).

rate is lower at the time of payout than at the time of contribution (e.g. if you are a pensioner and do not pay the highest marginal tax rate, although you received the high tax deduction when you were in active employment), the result is a further tax advantage.[1] In contrast, private pension schemes and civil servant pensions are set off against public benefits in some instances.

The number of persons holding pension wealth has been rising for many years, but growth in this area took off in earnest in the early 1990s with the introduction of labour market pensions in the agreements covered by the Danish Confederation of Trade Unions and the Confederation of Danish Employers, cf. Table 1.

Since the millennium rollover, growth in contributions from savings-based schemes has by far outpaced growth in payouts. Contributions now account for 6-7 per cent of GDP, cf. Chart 2, primarily reflecting the widespread use of labour-market pensions.[2] During the last decade, net contributions have risen from about 1.5 per cent of GDP to around 3 per cent. The yield on these schemes (after tax) fluctuates extensively from one year to the next, at around 5 per cent of GDP. The flat trend of the yield as a percentage of GDP reflects two opposite effects: declining nominal interest rates and rising pension wealth.

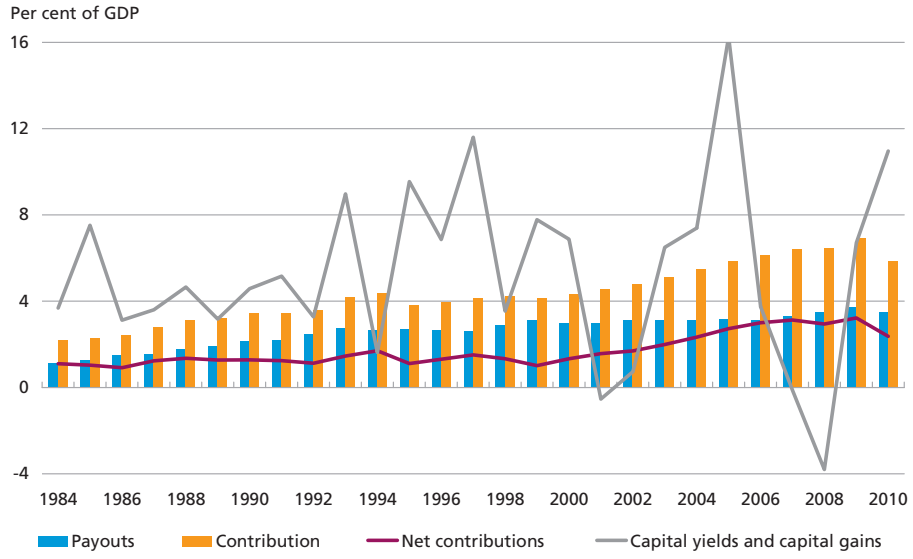
Payouts under savings-based schemes increased from about 1 per cent of GDP in 1984 to approximately 3.5 per cent in 2010. Following the strong growth, they currently account for about 35 per cent of total

[1] The incentive of tax asymmetries between contributions and payouts is uncertain, as the rate of marginal tax at the time of payout is unknown. Under the current rules, overall marginal tax at the time of payout is often quite high due to set-off of pensioner credits, etc., cf. Møller and Parum (2007).

[2] GDP growth was high in the second half of the 1990s. Accordingly, net contributions as a percentage of GDP did not increase. Therefore, the rise in net contributions from 1999 onwards seems particularly sharp.

CONTRIBUTIONS TO AND PAYOUTS FROM CONTRIBUTION-BASED SCHEMES

Chart 2



Note: Including contributions to and payouts from the SP, DSP and LD schemes. Pre-1995 data have been constructed by extending the 1995 level backwards using developments in contributions and payouts including transactions related to transfer of pension savings from one company to another. Capital yields and capital gains have been residually calculated and measure returns after tax. Figures for 2008-10 are preliminary.

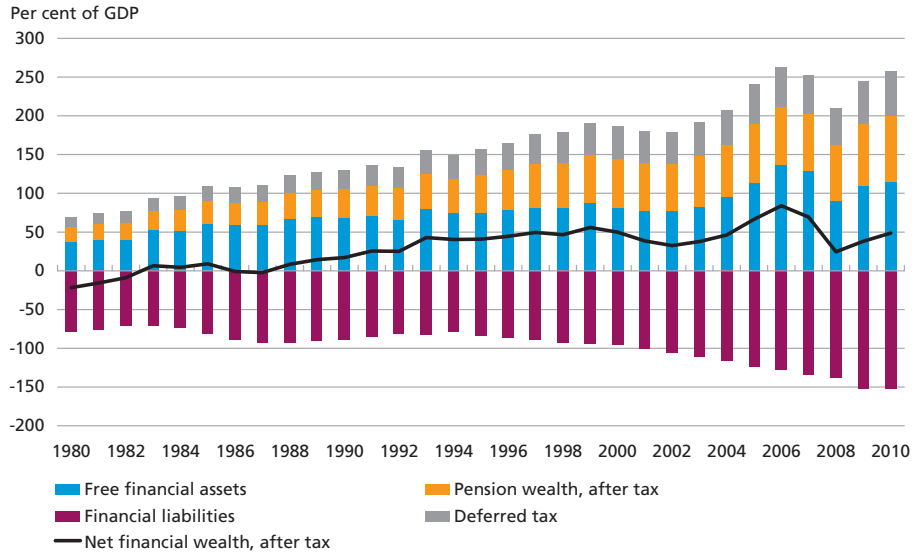
Source: Own calculations based on data from ADAM and Statistics Denmark.

pension payouts, up from approximately 15 per cent in 1984. When the pension system is fully matured, this share is expected to have increased to around 50 per cent, cf. Welfare Commission (2006). Growing payouts from pension schemes entail that coverage – i.e. the income as a pensioner relative to the income as a wage earner – has been increasing. Looking forward, coverage is expected to increase further with the maturing of the pension system. This especially applies to groups that have only recently begun to contribute to a labour-market pension scheme, e.g. wage earners covered by the agreements between the Danish Confederation of Trade Unions and the Confederation of Danish Employers, cf. the Welfare Commission (2006).

HOUSEHOLDS' AGGREGATE FINANCIAL BALANCE SHEET

Households' total net financial wealth rose until the mid-1990s, cf. Chart 3. From the late 1990s until 2010, net financial wealth accounted for a fairly constant, although varying, percentage of GDP. However, net financial wealth is greatly affected by equity prices and therefore, in the short term, is cyclically driven. From the end of 2006 until the end of 2008, equity prices plummeted, leading to sharp capital losses. Since

HOUSEHOLD FINANCIAL BALANCE SHEETS Chart 3



Note: Pension wealth is calculated after tax, i.e. less estimated future income tax on payouts. Hence, the value of pension wealth for households is comparable to that of other financial savings that are non-deductible and therefore non-taxable. Pension wealth before tax is equivalent to pension wealth after tax plus deferred tax.
Source: Danmarks Nationalbank.

then, households have increased their savings ratio, which – viewed in isolation – points towards higher net financial assets over the coming years.[1]

These developments mask significant growth in household pension wealth and free financial assets. Pulling in the opposite direction is an increase in household gross debt, reflecting substantial overall expansion of balance sheets.

During the period 1980-2010, growth in total net financial wealth after tax was driven equally by the increase in pension wealth and free financial wealth, cf. Table 2. As a result of the rise in savings, this period saw a reversal from permanent deficits to permanent surpluses on the current account. This was attributable to a number of factors, the two most important ones being the expansion of private pension savings and lower interest deductibility.

In addition to net financial wealth, households hold large real assets, including substantial housing wealth. In Denmark, housing wealth is relatively liquid because the Danish mortgage-credit system makes it easy to raise loans using home equity as collateral. Hence, considerable

[1] From end-2010 to end-2011, Danish equity prices dropped by about 15 per cent, which reduced net financial wealth, excluding pension. In early 2012, equity prices have increased to around the level seen at end-2010.

CHANGES IN HOUSEHOLD BALANCE SHEETS Table 2

Changes, percentage of GDP	Change 1980-2010
Net financial wealth, after tax	70
Financial assets, after tax	144
Of which: Pension wealth before tax	111
Deferred tax[1]	-45
Pension wealth after tax	66
Free financial assets	77
Gross debt	73

Source: Danmarks Nationalbank.
[1] Deferred tax is calculated as 40 per cent of pension wealth.

housing wealth has been a prerequisite for the ability of Danish households to increase their gross debt over the last 30 years.

The growth in household pension wealth is attributable to a combination of large net contributions (approximately 25 per cent) and accumulated returns and capital gains (approximately 75 pct.), cf. Chart 4.

Based on a stylised projection in Dream[1], household pension wealth is estimated to rise by just over 60 per cent of GDP over the next 30 years, cf. Chart 5.

It should be noted that, based on aggregated net wealth alone, it is not possible to assess household vulnerability to economic shocks, given that the distribution of wealth and debt is not known.

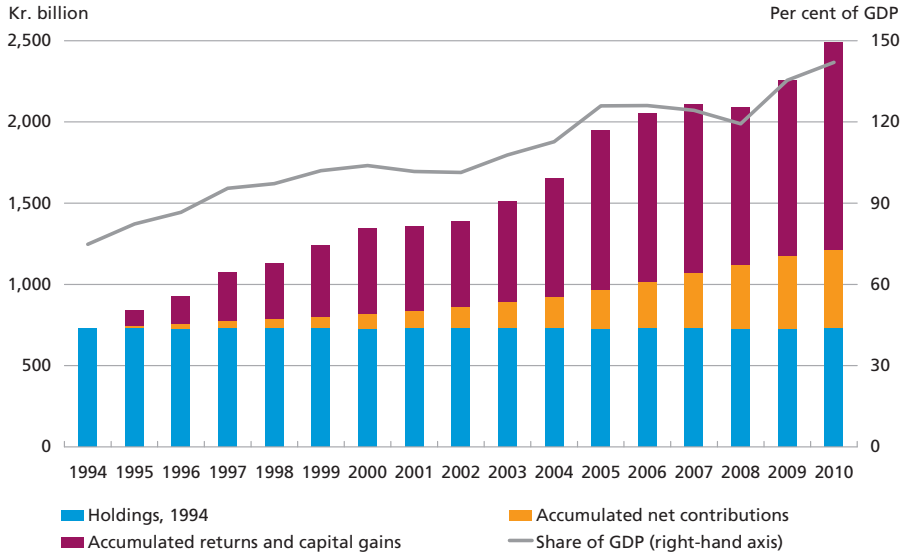
Given the extensive and partly opposite changes in pension savings, free financial assets and gross debt, it is not possible to conclude to what extent the development in overall financial savings is attributable to changes in the structure of the pension system and lower interest deductibility, etc.

It is to be expected that households have included and will continue to include knowledge about the size of their pension savings in the management of their overall savings, including investment in free assets, repayments on housing loans and raising of new loans. For instance, mandatory pension contributions could prompt households to repay housing loans more slowly and high pension wealth reduces the need to be debt-free at retirement.

An analysis based on trends in debt and wealth ratios across a number of countries concludes that when pension wealth increases by kr. 100, debt rises by kr. 30-40, cf. Isaksen et al. (2011). Hence rising pension wealth may have been a major factor behind the increase in the gross debt of Danish households. Viewed in isolation, increasing pension wealth therefore points to further growth in household debt over the coming years. Other studies show a smaller crowding-out effect, cf. Box 1.

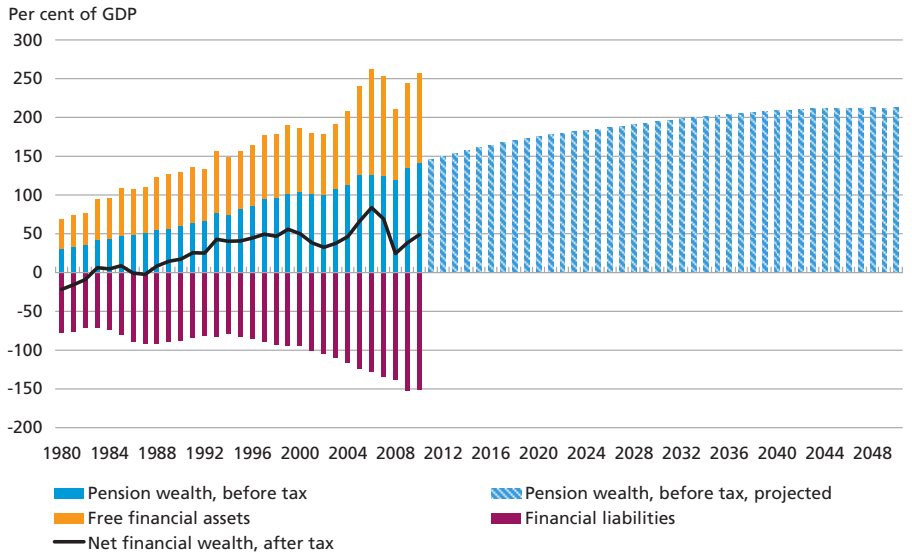
[1] Danish Rational Economic Agents Model. See http://www.dreammodel.dk/

HOUSEHOLD WEALTH INVESTED IN PENSION COMPANIES — Chart 4



Note: Pension wealth has been calculated before tax. Net contributions are based on data from ADAM.
Source: Statistics Denmark and own calculations.

HOUSEHOLD NET FINANCIAL WEALTH AND PROJECTION OF PENSION WEALTH — Chart 5



Note: Pension wealth before tax. The projection is based on Dream, with levels adjusted to historical data. This means that pension wealth is increased by approximately 7 per cent of GDP throughout the period.
Source: Statistics Denmark, Danmarks Nationalbank and Dream.

BEHAVIOURAL IMPLICATIONS OF LABOUR-MARKET PENSION SCHEMES Box 1

Labour-market pension schemes entail that a large percentage of wage earners must contribute part of their wages to pension schemes. It is uncertain how and to what extent the introduction of mandatory pension schemes and the use of voluntary schemes have affected overall household savings and balance sheets. Household behaviour in terms of pension savings hinges on a number of factors, including set-off of public benefits and liquidity restraints. At the same time, the period from the late 1980s was characterised by changes in other circumstances impacting the propensity to save, especially lower tax deductibility of interest expenses and a number of years of low inflation.

An empirical analysis of data at individual level during the period 1998-2004 demonstrates a relatively small crowding-out effect. The analysis concludes that total savings rise by about kr. 0.70-0.80 with each krone contributed through a mandatory pension scheme, cf. Economic Councils (2008). According to the analysis, this implies that one additional krone contributed to a labour-market scheme will reduce other savings by about kr. 0.20-0.30 (e.g. by the household increasing its borrowing by 0.20-0.30), i.e. the crowding-out effect of other savings is relatively modest.[1]

A positive savings effect of this magnitude does not comply with the aggregated figures in the national accounts according to which the household savings ratio has not shown an increase over the last 40-odd years. This should be seen against the backdrop that, during the same period, households have reaped significant capital gains, which, viewed in isolation, points towards a lower savings ratio. Hence it is possible that the savings ratio would have fallen, had it not been mandatory for households to save through labour-market pensions.

[1] Cf. Economic Councils (2008) and Arnberg and Barslund (2012).

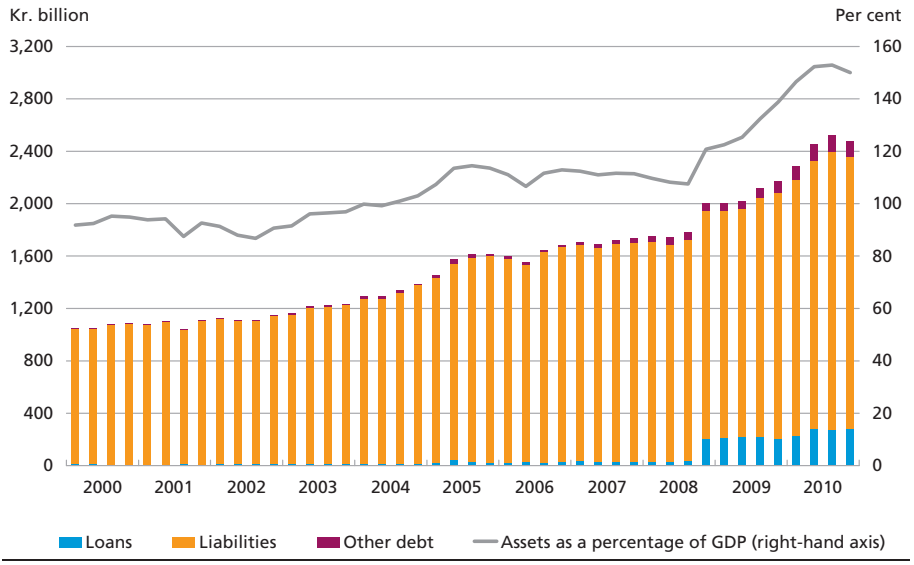
THE PENSION SECTOR IS A MAJOR PLAYER IN THE FINANCIAL MARKETS

Over the last decade, the pension sector's total assets have risen from around 90 per cent of GDP in 2000 to approximately 150 per cent of GDP in 2010, cf. Chart 6.[1] This is reflected in an increasing investment need for the sector. With the growth in pension schemes, pension companies play an increasing role in the capital and foreign-exchange markets.

Moreover, some companies choose to leverage themselves by borrowing additional funds against the company's assets as collateral, enabling them to invest larger amounts. This also entails that some companies have an ongoing need to borrow funds in the market. Use of financial derivatives may also indicate leveraging. The typical aim of leveraging is, on the one hand, to achieve a higher expected return, and, on the other, to increase the likelihood that the companies will be able to meet their payment obligations.

[1] Household pension savings invested in pension companies account for about 80 per cent of the pension sector's total assets, equivalent to approximately 120 per cent of GDP. Household pension savings at banks (accounting for roughly 20 per cent of GDP) are not included.

PENSION SECTOR LIABILITIES Chart 6



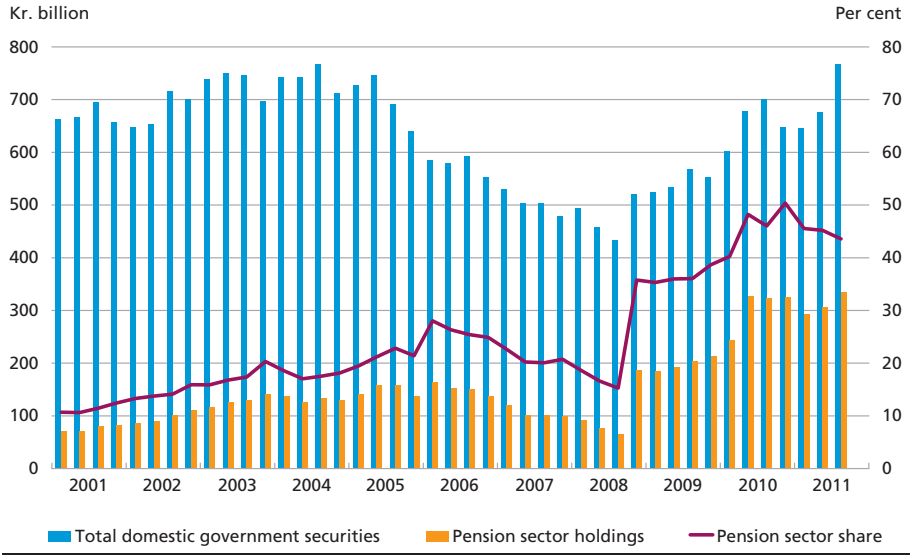
Note: Assets as a percentage of GDP are the moving average of four quarters. Figures are exclusive of pension funds in the LD and SP schemes and in banks.
Source: Danmarks Nationalbank.

In 2001, the pension sector's holdings of *domestic government securities*, i.e. Danish government bonds and T-bills, amounted to just over kr. 100 billion, equivalent to an 11-per-cent ownership interest in the central government's total domestic issuance, cf. Chart 7. At the end of the 3rd quarter of 2011, the sector's holdings of domestic government securities totalled just under kr. 350 billion and the ownership interest had increased to 45 per cent.

The sharp increase in the 4th quarter of 2008 was attributable to the central government's issuance of a 30-year government bond, the vast majority of which was acquired by the pension sector. To some extent, the companies sold euro securities to purchase Danish government bonds. This helped to underpin the exchange rate of the krone during a period of pressure following the collapse of Lehman Brothers.

During the period 2001-10, the pension sector's holdings of *Danish mortgage bonds* increased by kr. 380 billion, cf. Chart 8 (left-hand side). Despite strong growth in the Danish mortgage market, pension companies maintained an ownership interest of one third. On the other hand, there was a notable shift in the portfolio composition, with short-term mortgage bonds (remaining term to maturity up to and including five years) with and without amortisation accounting for an ever increasing proportion of total mortgage-credit holdings. The reason is that households have extensively financed home purchases via adjust-

PENSION SECTOR HOLDINGS OF DOMESTIC GOVERNMENT SECURITIES — Chart 7

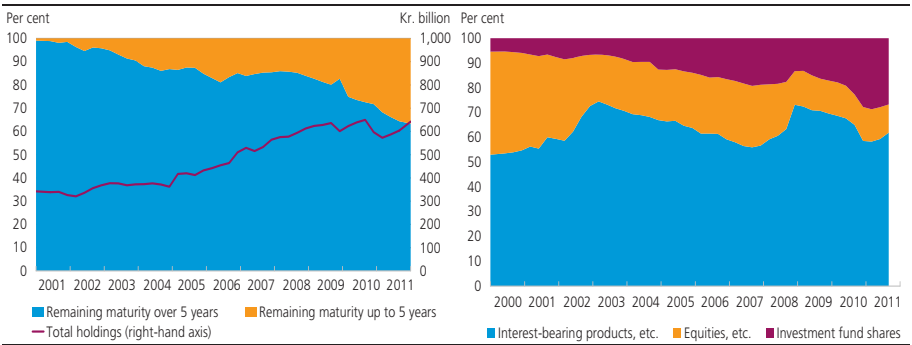


Note: Domestic government securities are government bonds and T-bills in Danish kroner. Figures include investment associations in which the pension sector has an ownership interest of at least 95 per cent, but exclude pension funds in the LD and SP schemes and in banks.
Source: Danmarks Nationalbank.

able-rate loans. As a result, the supply of short-term mortgage bonds increased sharply.

During recent years, a growing proportion of the pension sector's assets have been converted from direct to indirect ownership through *investment fund shares*, cf. Chart 8 (right-hand side). This is attributable *inter alia* to the increasing popularity of products where the customers bear a higher proportion of the investment risk and have greater influ-

PENSION SECTOR HOLDINGS AF DANISH MORTGAGE BONDS (LEFT-HAND SIDE) AND ASSET ALLOCATION (RIGHT-HAND SIDE) — Chart 8



Note: Figures for the left-hand chart include investment associations in which the pension sector holds an ownership interest of at least 95 per cent, but exclude pension funds in the LD and SP schemes and in banks.
Source: Danmarks Nationalbank.

ence on the investment composition. Many pension companies offer their customers to mix their own pension portfolio, either in full or in part, based on selected units.[1] With these products, the customers bear much of the investment risk, as there is no guaranteed return. This also means that pension companies have less incentive to purchase long-term, fixed-rate bonds or other products that ensure a minimum return, cf. below.

Investment decisions and pension guarantees

Pension sector payouts are in the distant future relative to customers' contributions. Obviously, the pension companies' commitments in terms of payouts play a key role in their investment policies.

Pension schemes have typically been based on a guaranteed rate of interest, indicating a nominal minimum yield on pension savings. The Danish Financial Supervisory Authority has established a maximum guaranteed rate of interest as the upper limit on the yield pension companies are allowed to guarantee to customers. Hence each company has to decide for itself whether it is appropriate to offer the maximum rate of interest.

At end-2010, pension sector provisions for guaranteed benefits totalled kr. 1,260 billion, corresponding to 63 per cent of total assets.[2] Provisions for contracts with guarantees in excess of 4 per cent still account for a significant percentage of total provisions, approximately one third, but this percentage has been declining during recent years.

As the return on investment may be lower than the guaranteed rate of interest, pension companies offering high guaranteed rates of interest are faced with a number of challenges. Chart 9 (left-hand side) shows that the fall in the market rate since 1984 has narrowed the margin between the safe market return after tax and maximum guarantees.

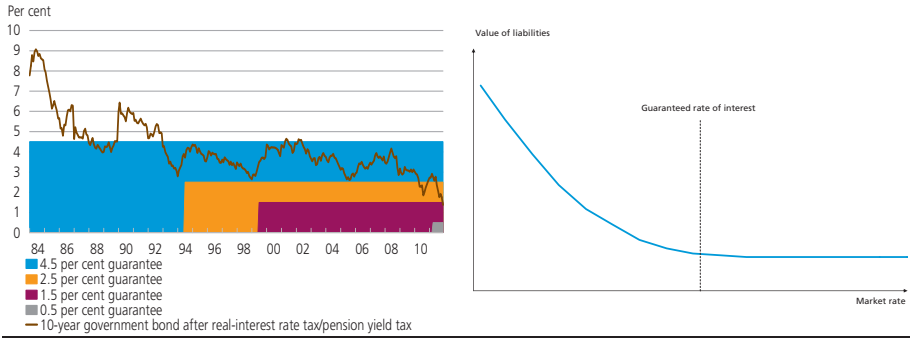
A pension guarantee means that the pension companies must, as a minimum, pay the guaranteed rate of interest on the customers' savings over a very long period of time. When the market rate is close to or lower than the guaranteed rate of interest, the value of the company's liabilities increases as the market rate declines, cf. Chart 9 (right-hand side). In other words, the *interest-rate sensitivity* of liabilities is high.

When interest rates are low, pension companies therefore need to hold bonds – or other instruments – that appreciate in value when interest rates decline. Examples could be long-term, fixed-rate bonds or vari-

[1] Overall, there are two types of market-rate products. With unit-linked products, the customer composes his own portfolio, mostly on the basis of a selection of units. With lifecycle products, the customer may opt to have some influence on the investment composition, e.g. based on the risk profiles high, medium or low.

[2] The figure includes bonus potential and excludes provisions for unit-linked contracts.

MAXIMUM GUARANTEED RATES OF INTEREST AND YIELD TO MATURITY ON GOVERNMENT BONDS (LEFT-HAND SIDE) AND RELATION BETWEEN THE VALUE OF PENSION COMPANY LIABILITIES AND THE MARKET RATE (RIGHT-HAND SIDE) Chart 9



Note: The yield to maturity on government bonds is calculated using a 10-year Danish government bond after real-interest rate tax and after pension yield tax after the year 2000. The maximum guaranteed rates of interest are shown after deduction of an expense premium and loading for risk, typically at 0.5 percentage points.
Source: Danish Ministry of Taxation and Danmarks Nationalbank.

ous financial derivatives with high interest-rate sensitivity, for instance interest-rate swaps on which the company receives a fixed rate of interest for a long period of time, while paying a variable rate of interest. Other examples could be products on which the company receives a variable rate of interest, which cannot fall below a specified floor.

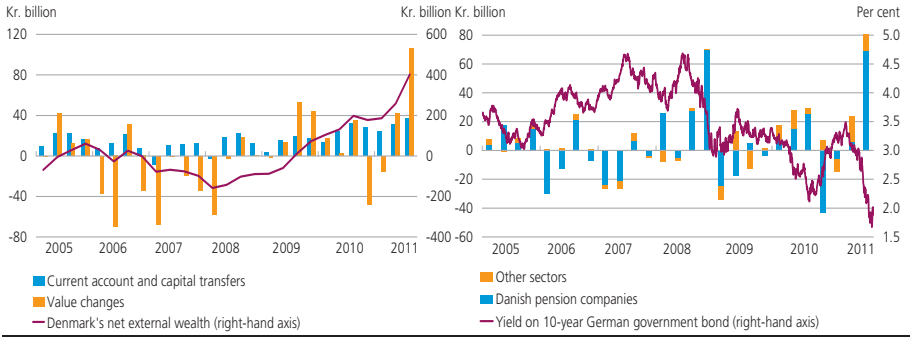
The pension sector has purchased substantial amounts of derivatives to achieve higher interest-rate sensitivity. Some of these derivatives are based on euro interest rates – the reasons being that, on account of the fixed-exchange-rate policy, the euro interest rate is very closely correlated with the interest rate in Danish kroner and that the market for derivatives in euro is much larger than the market for derivatives in Danish kroner.

When derivatives are traded with non-resident counterparties, large fluctuations in value may impact Denmark's external net wealth. Chart 10 (left-hand side) shows that the external net wealth increased quite strongly in the 3rd quarter of 2011. A very substantial percentage of the increase is attributable to the Danish pension sector's capital gains on foreign derivatives, cf. Chart 10 (right-hand side). Chart 10 also shows that the value of the pension sector's derivatives is highly dependent on interest rates in Germany. Falls in German interest rates are reflected in large gains on the sector's financial contracts.

Discount curve and market impact

Pension companies are responsible for having sufficient assets to meet their liabilities. The Danish Financial Supervisory Authority regularly assesses whether they fulfil this requirement. The regulation in this field is

DENMARK'S NET EXTERNAL WEALTH (LEFT-HAND SIDE) AND CAPITAL GAINS/LOSSES ON DANISH SECTORS' DERIVATIVES TRADED WITH NON-RESIDENTS (RIGHT-HAND SIDE) Chart 10



Source: Danmarks Nationalbank.

important when it comes to the investment behaviour of the companies – and thus to the foreign-exchange and capital markets.

Since 2003, Danish pension companies have determined the value of their liabilities based on the Danish Financial Supervisory Authority's discount curve, which is published daily. The discount curve is a yield curve[1], used to discount pension company liabilities. In 2003, the curve was fixed based on the euro swap rate, adjusted for the 10-year Danish-German yield spread.

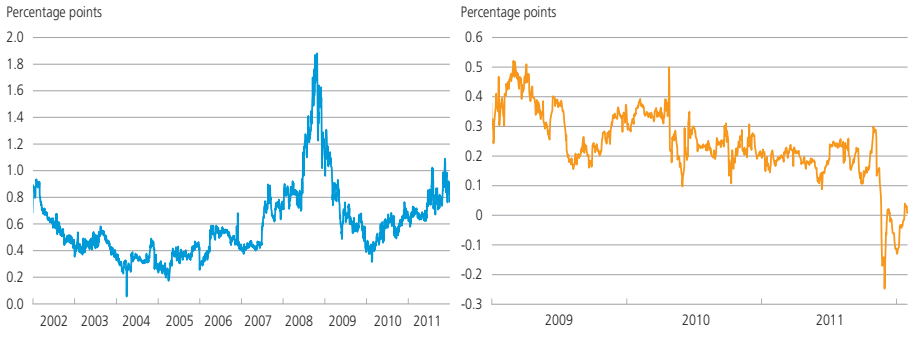
If a company has investments that reflect the discount curve, its solvency ratio will not be affected by changes in interest rates. It may, however, be inexpedient to invest in a manner corresponding to the discount curve. Hence, it will be difficult to obtain a higher return if the market return increases and it may be difficult to acquire sufficient volumes of instruments in the markets.

If pension companies do not have considerable excess capital, lack of hedging may trigger strong market dynamics, for example if the discount curve falls, while the interest rates of the assets actually owned by the pension companies remain unchanged. In that case, the value of the pension companies' liabilities will increase, while the asset value remains unchanged. This will reduce the companies' excess capital. To protect themselves against further downward pressure on their excess capital, the companies may wish quickly to reallocate their portfolio to better align it with the discount curve. Given the size of the pension sector, this could have a massive impact on the market.

During the 2008 financial crisis, the credit spread between mortgage bonds and government bonds widened significantly, cf. Chart 11 (left-

[1] Some pension schemes may use simpler methods.

30-YEAR CREDIT SPREAD (LEFT-HAND SIDE) AND 10-YEAR YIELD SPREAD TO GERMANY (RIGHT-HAND SIDE) Chart 11



Note: The 10-year yield spread shows the same pattern, but the effect is more pronounced in the 30-year spread. Yield spreads to Germany are based on 10-year zero-coupon yields.
Source: Bloomberg and Nordea Analytics.

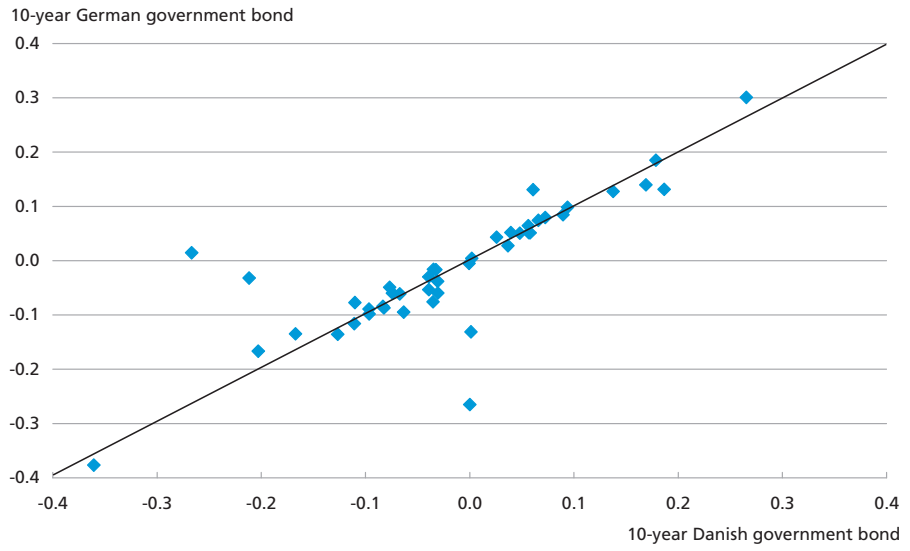
hand side). Since mortgage yields were not part of the discount curve, the widening entailed that the decline in the market value of the mortgage holdings was not matched by an equivalent fall in the value of liabilities. This gave the pension companies an incentive to sell mortgage bonds. To dissuade the companies from divesting mortgage bonds unnecessarily, the discount curve was changed to include mortgage bond yields. Hence, the pension companies no longer had an incentive to sell mortgage bonds, and the spread between mortgage bonds and government bonds fell back, cf. Chart 11.

2011 saw another adjustment of the discount curve. The European sovereign debt crisis caused a gradual narrowing of the Danish-German yield spread, cf. Chart 11 (right-hand side). On account of the substantial weight of Danish interest rates in the discount curve, the value of pension company liabilities increased more than the value of their assets. This reduced the companies' excess capital adequacy and gave them the incentive to sell German government bonds and buy Danish ones. This applied further downward pressure on Danish government bond yields, and the krone strengthened. This could have started a process of self-reinforcing dynamics, with adverse impacts on the companies' excess capital adequacy – and on pension savers. Against this backdrop, the discount curve was adjusted. Due to the size of the sector, potential reallocations in response to the negative yield spread could also impact the bond and foreign-exchange markets. One of the results of the latest adjustment of the discount curve is that the spread between the Danish and German government bond yields is now part of a 12-month moving average with a zero lower bound.[1]

[1] See www.finanstilsynet.dk

RELATION BETWEEN QUARTERLY YIELDS ON GERMAN AND DANISH GOVERNMENT BONDS

Chart 12



Source: Bloomberg and own calculations.

The structure of the discount curve is to reflect overall developments in market rates. Most pension company liabilities are in Danish kroner. Hence, it is natural for Danish interest rates to have a relative high weighting in the discount curve. On the other hand, the domestic financial markets are not large enough to absorb the sector's requirement for long maturities. Consequently, the euro swap rate and the German government bond yield are also included.

Danish and German government bond yields typically show the same pattern, cf. Chart 12, albeit without a clear one-to-one relation. The zero lower bound is to prevent a scenario under which a narrowing in the Danish-German yield spread leads to an abnormal pressure on the demand for Danish bonds. The moving average is intended to smooth the impact of daily fluctuations in the country spread, as these are difficult to hedge.

LITERATURE

Arnberg, Søren and Mikkel Barslund (2012), The crowding-out effect of mandatory labour market pension schemes on private savings: Evidence from renters in Denmark, *Danish Economic Councils Working papers,* No. 1, January.

ATP (2008), Mere end hver tredje erhvervsaktiv under 40 år har pensionshuller (More than one in three people of working age below 40 have pension-savings gaps – in Danish only), *faktum*, No. 56, May.

Danish Economic Councils (2008), *The Danish Economy*, Spring, Chapter 2.

European Commission (2009), Pension schemes and pension projections in the EU-27 member states – 2008-2060, *Occasional Papers*, No. 56, October.

Isaksen, Jacob, Paul Kramp, Louise Sørensen and Søren Sørensen (2011), Household balance sheets and debt – an international country study, Danmarks Nationalbank, *Monetary Review*, 4th Quarter, Part 2, pp 39-81.

Møller, Michael and Claus Parum (2006), Beskatning af pension (Pension taxation – in Danish only), Nordic Tax Research Council, *Dansk Økonomisk Nationalrapport*.

Mogensen, Louise (2002), Market dynamics at low interest rates, Danmarks Nationalbank, *Monetary Review*, 1st Quarter, pp 69-75.

Danish Ministry of Taxation (2012), Pensionsindskud 1998-2010 (Pension contributions 1998-2010 – in Danish only), http://www.skm.dk/tal_statistik/skatter_og_afgifter/668.html

Welfare Commission (2006), De fremtidige pensionsindkomster (Future pension income – in Danish only), *Fremtidens velfærd – vores valg*, Chapter 5.

Write-down of Greek Debt and New EU/IMF Loan Programme

Uffe Mikkelsen and Søren Vester Sørensen, Economics

INTRODUCTION AND SUMMARY

In 2010, Greece was granted a three-year loan programme when it became clear that the country would not be able to refinance its debts in the markets and needed time to rein in its unsustainable government finances. As part of the loan programme, Greece has implemented major fiscal austerity measures, but has not adequately met its obligations under the agreements, particularly when it comes to implementation of structural reforms. On top of that, the downturn in the Greek economy has proved to be much deeper than previously assumed and the Greek government debt has grown to an unsustainable level. To help address these issues, Greece has entered into an agreement with the euro area member states and the International Monetary Fund, IMF, on the conditions for a new loan programme. A key element in the new programme is the restructuring of the Greek government debt, entailing a write-down ("hair-cut") of private investors' share of the debt.

As a condition for the new loan programme, Greece has implemented, and is committed to implementing, a number of additional reform measures. Following the debt write-down and the adoption of the new programme, the country's government debt will be held primarily by international public institutions. This reduces the immediate economic and financial risks for the private sectors of other countries in the event of a disorderly Greece default. The drawback is that the severe risks have been transferred to the government finances of the lender countries. The new loan programme will buy Greece time to implement the structural adjustments necessary to ensure sustainable economic development. Substantial risks still surround the programme and delayed implementation of the agreed austerity measures and reforms could cause debt to return to unsustainable levels.

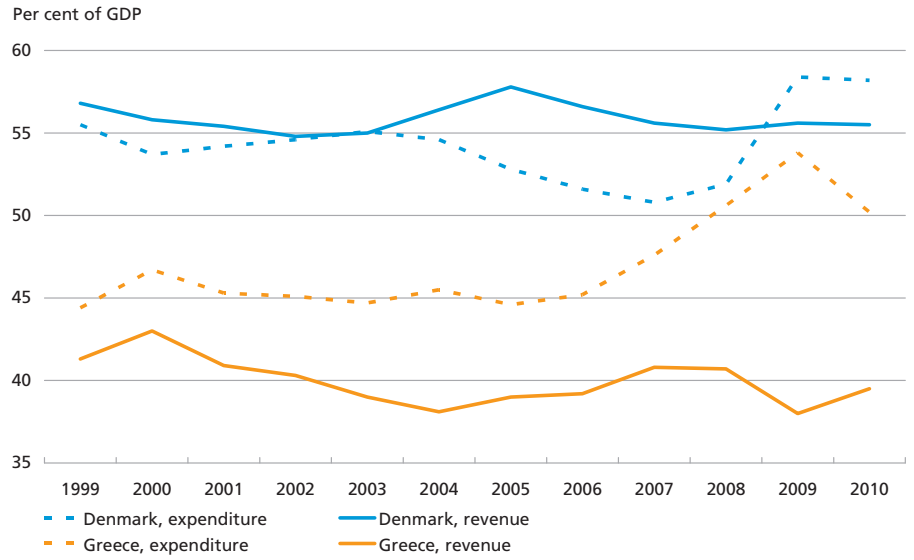
UNSUSTAINABLE DEVELOPMENT UNDER PREVIOUS PROGRAMME

Deeper-than-expected downturn in the Greek economy

In the wake of statistical revisions showing that the Greek deficit had spun out of control in 2008 and 2009, cf. Chart 1, Greece applied for a loan with the IMF and the euro area member states in the spring of 2010. The fiscal austerity measures implemented in January 2010 had turned out to be insufficient and the markets were not convinced that the Greek debt situation was under control. The Greek government entered into an agreement on a three-year loan package from the euro area member states and the IMF worth a total of 110 billion euro, based on an ambitious reform programme.

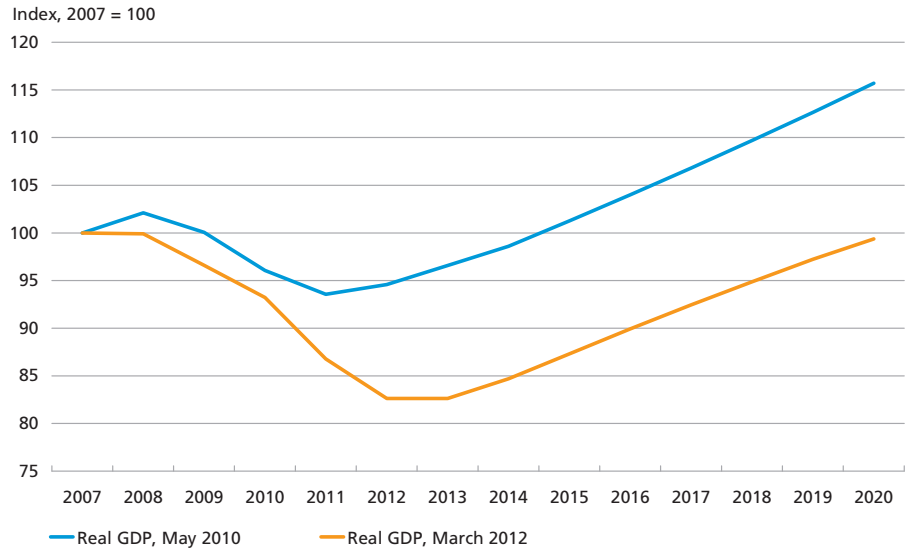
When the loan programme was concluded, it was assumed that the Greek economy would remain in recession up to end-2011, followed by a gradual return to positive growth. With revisions of the national accounts, slower global growth, weakened consumer and business confidence, a banking sector under pressure and the contractionary effects of fiscal consolidation, the real decline in the gross domestic product, GDP, has been more than 10 percentage points higher than initially assumed, cf. Chart 2. Since the review of the Greek programme in December 2011, the growth outlook has been further downgraded. Now positive growth is not expected until 2014.

GOVERNMENT EXPENDITURE AND REVENUE AS A PERCENTAGE OF GDP FOR DENMARK AND GREECE — Chart 1



Source: Eurostat.

DEVELOPMENT IN REAL GDP AS ASSUMED AT DIFFERENT TIMES Chart 2



Source: IMF, *Country Report*, 10/110, 2010, and IMF, *Country Report,* 12/57, 2012.

Lacking implementation of structural reforms

In addition to the downturn in the Greek economy, lacking implementation of fiscal and growth-enhancing structural reforms also means that the 2010 loan programme has been insufficient to stabilise debt. In early 2011, following the third programme review, it became necessary for the Greek authorities to introduce new fiscal consolidation measures to meet the agreed targets. Although Greece has made significant strides in achieving fiscal consolidation, cf. Box 1, this pattern repeated itself at the following reviews. This reflects insufficient implementation of reforms to the government expenditure and tax structures and the tax administration. Another key factor is lacking implementation of growth-enhancing structural reforms. During the term of the programme, the European Commission has generally assessed the implementation of reforms to be insufficient, cf. Chart 3.

Without such reforms, delivering continued fiscal consolidation and achieving positive growth will be difficult for Greece. Among the prerequisites for achieving higher growth are enhanced private-sector wage flexibility and sharper competition in a number of sectors. Although the Greek parliament has adopted legislation in this field, it has been difficult to implement adjustments to private-sector wage agreement systems and to reduce the protection of a number of service sectors, including transport, pharmacies, accountants. These adjustments are es-

FISCAL AUSTERITY MEASURES IN GREECE Box 1

As part of its loan programme, Greece has implemented major fiscal austerity measures to reduce its government deficit. According to the Commission's report on the fifth programme review, Greece has implemented consolidation measures worth more than 16 per cent of GDP to reduce its deficit from 15.5 per cent of GDP in 2009 to 9 per cent of GDP in 2011. Without these measures, the deficit would have grown even further. The budget-enhancing measures include the following:

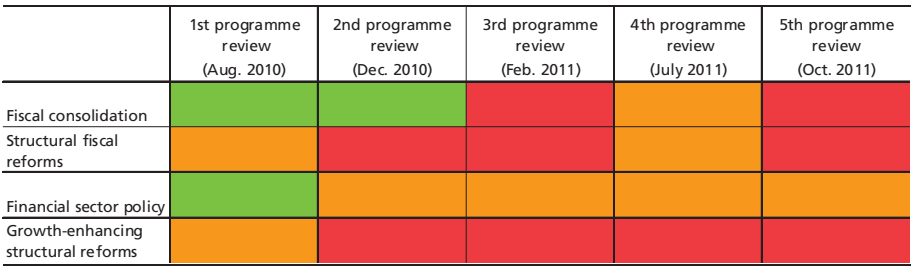
- Cuts in public-sector salaries by 17 pct.
- Cuts in public-sector employment by a little over 13 per cent from 2010 to 2012
- More VAT revenue to be raised e.g. through higher VAT rates and by extending VAT to services that were previously exempt from VAT
- Higher taxes on fuel, tobacco, alcohol and luxury goods
- Cuts in the highest pensions and abolition of seasonal bonuses
- Introduction of a special housing tax of 3-16 euro per square metre.

In addition to measures with immediate impact on the deficit, Greece adopted a pension reform in 2010, which, in the long term, will mean that pension expenditure increases by 2.5 per cent of GDP instead of 12.5 per cent as indicated by projections, had the reforms not been implemented. Under the reforms, the retirement age will be raised, the retirement age will be indexed to average life expectancy, pensions will be indexed to price inflation instead of wage inflation and pension benefits will be reduced by using pensioners' average pay over their working lives rather than their final salary. With a contribution to long-term structural improvement of government finances of 10 per cent of GDP, the pension reforms are a key element in the efforts to ensure the sustainability of government finances in Greece.

sential in terms of generating dynamics and productivity increases in the domestic economy and enhancing Greece's international competitiveness.

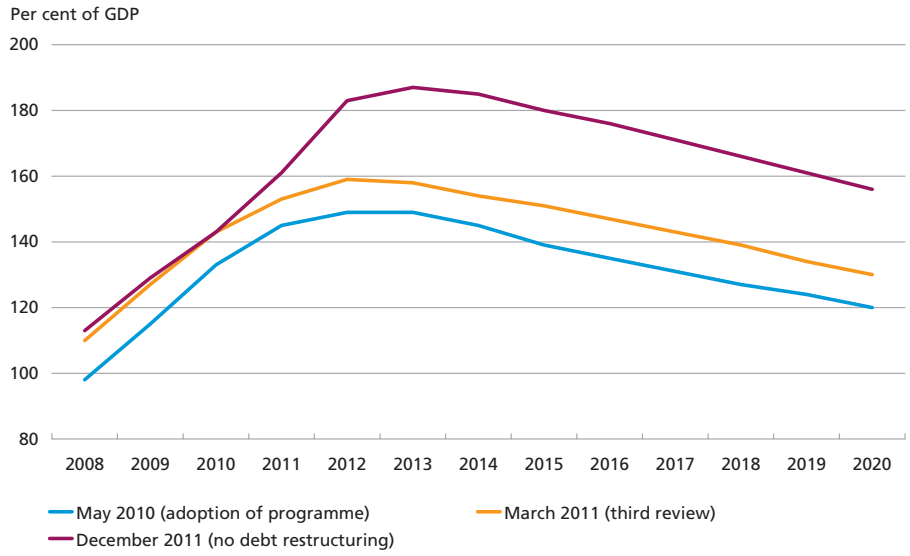
Despite severe austerity measures, it became clear that the trend of the Greek sovereign debt was unsustainable under the first rescue package. At the adoption of the 2010 loan programme, debt was expected

LACKING IMPLEMENTATION OF AGREED REFORMS Chart 3



Note: Green indicates that, in its report on the programme review in question, the European Commission assessed that the topic was "observed", yellow indicates "largely observed", and red indicates "partially observed".
Source: European Commission, various reports on the Greek loan programme and own estimates.

SLIDE IN PROJECTIONS OF GREEK GOVERNMENT DEBT – DECEMBER 2011 Chart 4



Source: IMF, *Country Report*, no. 110, 2010, IMF, *Country Report*, no. 68, 2011 and IMF, *Country Report*, no. 351, 2011.

to peak at around 150 per cent of GDP in 2013, followed by a gradual decline to 120 per cent of GDP in 2020 – a target considered by the IMF and the Commission to be a prerequisite for the sustainability of the programme. Subsequently, the outlook for government debt has deteriorated significantly and in the latest programme review in December, a debt-to-GDP ratio of 156 per cent was expected in 2020, cf. Chart 4.

In light of the unsustainable prospects for government debt, it soon emerged that a new loan programme was required. In July 2011, the euro area member states agreed that private-sector involvement, PSI – i.e. write-down of the Greek debt to private creditors – was a precondition for this programme. The Greek PSI was to be voluntary, based on negotiations with a group of major international banks. In this context, it was assumed that approximately 90 per cent of the private creditors would participate.

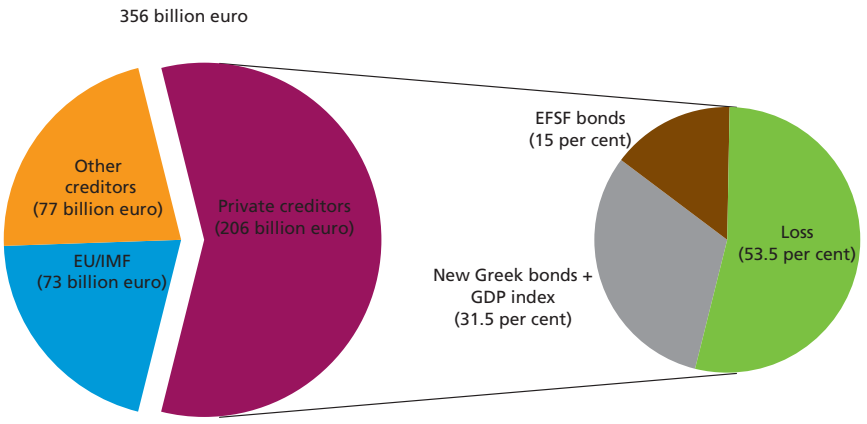
During the autumn, it became clear that the state of the Greek programme was in worse shape than had been assumed in July 2011. At the euro area summit on 26 October – following consultation with the international banks – the stage was set for increased PSI with a 50-per cent write-down of the principal. At the same time, the Greek government resigned and an interim government with the participation of the major Greek parties was commissioned to enter into a PSI agreement with private creditors and to create the basis for a new loan programme with new reform measures.

GREEK DEBT RESTRUCTURING AND PSI

On 22 February, the euro area member states and the IMF reached agreement with the Greek government on the conditions for a new loan programme. Significant write-down and restructuring of private creditors' share, 206 billion euro, of the total Greek government debt of just over 350 billion euro are prerequisites for the agreement, cf. Chart 5. The debt restructuring of private investors' bonds comprises the following elements:

- Write-down of 53.5 per cent of the principal of existing Greek government bonds.
- Exchange of 31.5 per cent of the principal for new Greek government bonds with a maturity of 11-30 years. The coupon of these bonds is 2 per cent from 2013 to 2015, 3 per cent from 2016 to 2020, 3.65 per cent in the year 2021 and 4.3 per cent in the years 2022-42.
- In addition to the new bonds, creditors receive GDP-linked securities for 31.5 per cent of the principal, paying an additional coupon of up to 1 per cent, depending on Greek GDP developments. These securities are detached from the new Greek government bonds.
- Allotment of 15 per cent of the principal as 1- and 2-year bonds from the temporary European Financial Stability Facility, EFSF.
- Accrued interest on existing bonds is paid out in the form of 6-month EFSF T-bills.

GREEK DEBT RESTRUCTURING — Chart 5



Source: IMF, European Commission and own calculations.

The coupon of the new Greek government bonds received by private creditors as part of the restructuring is lower than the market rate for Greek debt and the bonds have a maturity of 11-30 years. Assuming that the market rate is 12 per cent, this entails that the net present value of the new Greek bonds is approximately one third of the principal. This should be seen in the context that the market value of the existing bonds is already significantly lower than the principal, reflecting the high Greek government yields.

Moreover, the new Greek government bonds are issued under English law and a clause is introduced, stating that holders of these bonds cannot be placed at a disadvantage to other creditors (including public creditors). Consequently, it will be difficult for Greece to push through new write-downs of the new debt.

FORCED PARTICIPATION IN DEBT RESTRUCTURING

As already mentioned, the restructuring agreement was based on negotiations with a group of major international banks and the Greek authorities. Greece retroactively introduced Collective Action Clauses, CACs, enabling the Greek authorities to change bond conditions (such as write-down of principal and swapping of bonds for new ones) with the acceptance of a sufficient number of investors. 85.8 per cent of the private investors in these bonds endorsed this agreement. This was sufficient for the Greek government to use CACs, thereby subjecting the remaining private creditors under Greek law to a restructuring process under which all Greek government bonds under Greek law (177 billion euro) were restructured. In addition, most investors in Greek government bonds under foreign law and bonds issued by government-owned companies endorsed the agreement (equivalent to about 20 billion euro). Hence private investor debt amounting to 197 billion euro (95.7 per cent) was swapped in the restructuring process, cf. Table 1.

SWAP OF GREEK GOVERNMENT BONDS — Table 1

	Billion euro	Per cent of total
Government bonds under Greek law	177	86
- Voluntary participation (85.8 per cent of 177)	152	74
- Compulsory participation	25	12
Government bonds under foreign law and bonds issued by government-owned companies	28	14
- Voluntary acceptance of swap	20	9
- Other (participation to be clarified)	9	4
Total held by private creditors	206	100

Source: Greek Finance Ministry and own calculations.

On 9 March, the International Swaps and Derivatives Association, ISDA, resolved that the use of force in relation to the debt restructuring constituted a *credit event*. Consequently, *Credit Default Swaps* (financial asset paid out in the event of default on debt), issued on Greek government debt, fell due for payment.

NO WRITE-DOWN OF BONDS HELD BY THE ECB AND NATIONAL CENTRAL BANKS

Under its Securities Markets Programme, the ECB has purchased government bonds from crisis-stricken euro area member states, including Greece, to ensure the monetary-policy transmission mechanism. Moreover, a number of national central banks have held on to their holdings of Greek government bonds during the sovereign debt crisis. These bonds are not included in the debt restructuring. Any profit to member states in the form of capital gains from the ECB's and the national central banks' holdings of Greek government bonds will be earmarked for improving the Greek debt situation. ECB's profit will be disbursed to the national central banks, which will pass the profit on to individual euro area member states. The euro area member states will pass the profit on to Greece by retroactively reducing interest rates on their existing bilateral loans to Greece by 50 basis points. Any income received by member states from national central bank investments in Greek government bonds will be returned to Greece. Viewed in isolation, these two measures will reduce the Greek debt ratio by 4.6 percentage points by 2020.

NEW 130 BILLION EURO LOAN PROGRAMME

In expectation of further IMF contributions, the euro area member states have indicated their willingness to contribute further loans to Greece worth up to 130 billion euro until end-2014. The IMF will contribute a loan of 28 billion euro to Greece over a four-year period. This includes the IMF's share of the remaining payments under the original loan package.

The euro area member states have stipulated requirements of further Greek budget cuts and structural reforms in return for the new rescue package. A large number of prior actions had to be adopted prior to the disbursement of the rescue package, including

- deregulation of protected professions, including pharmacists, accountants and engineers
- improved tax administration (e.g. enhanced computer systems and tax audits for a number of high-income firms and individuals)

- cuts in pharmaceutical expenses (purchase of the least expensive pharmaceuticals)
- minimum wage cuts
- cuts in supplementary pensions.

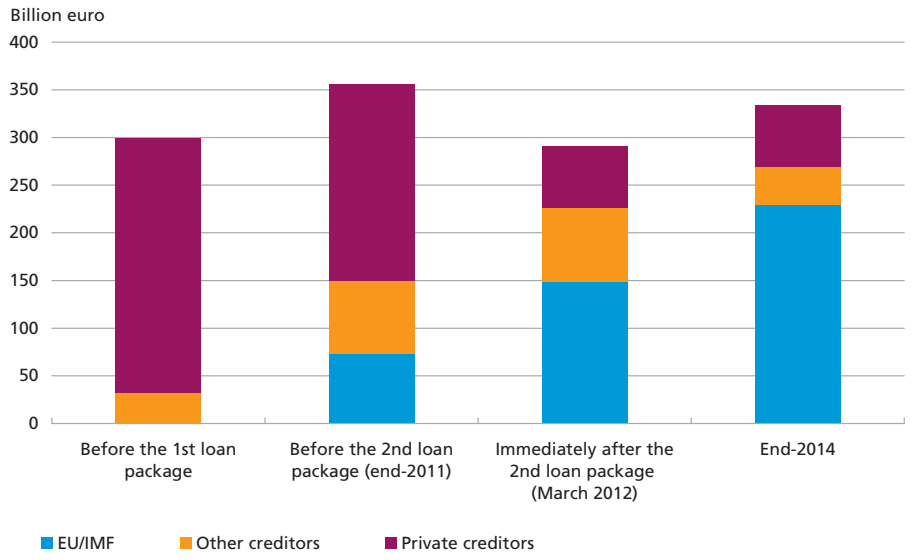
Furthermore, supervision and advice by the Commission in the implementation of agreed reforms are to be increased.

The new rescue package is to ensure that the Greek government financing requirement of 164.5 billion euro is covered until end-2014 by way of the new 130 billion euro rescue package and approximately 35 billion euro that is yet to be disbursed under the first rescue package. Part of the new rescue package is earmarked for the 15 per cent EFSF bonds (about 30 billion euro) and repayments on bonds that are not included in the restructuring – primarily the bonds held by the ECB and the national central banks. In addition, the Greek government has to pay in the region of 50 billion euro for the recapitalisation of Greek banks, part of which amount is a direct effect of PSI.

Following the restructuring of the Greek government debt, it will be held predominately by public creditors at end-2014. Immediately prior to the restructuring, about 60 per cent of the Greek government debt was

GREEK GOVERNMENT DEBT BEFORE, DURING AND AFTER THE TWO LOAN PACKAGES

Chart 6



Note: The debt reduction following the second loan package reflects a 53.5 per cent write-down of private investors' debt and direct restructuring expenses for the Greek government in the form of recapitalisation of Greek banks, provision of EFSF bonds worth 15 per cent of the value of the principal, accrued interest on existing bonds, etc.

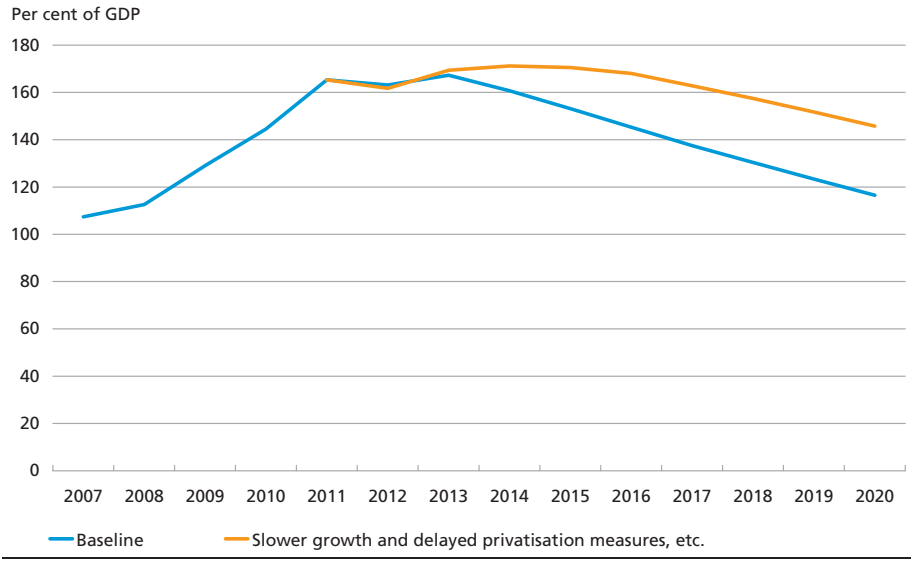
Source: IMF, *Country Report,* 12/57, 2012, European Commission, The Second Economic Adjustment Programme for Greece, March 2012, and own calculations.

held by private investors and the EU-IMF rescue packages accounted for less than one fourth of the debt, cf. Chart 6. With the adoption of the new rescue package, only about 20 per cent of the debt will be held by private creditors by end-2014. Accordingly, the risk of widespread turbulence in the European and global financial markets in the event of a disorderly Greek default seems to have been reduced. On the other hand, the severe risks have been transferred to the government finances of the lender countries.

RISK OF DISORDERLY GREEK DEFAULT HAS BEEN REDUCED, BUT RISKS REMAIN

Stabilising the Greek government debt will be a challenge – despite the write-down of debt and the new loan programme. In the context of a weak growth outlook for the euro area and massive public spending cuts in Greece, comprehensive structural reforms will be a prerequisite for achieving economic growth in excess of 2 per cent from 2014 as assumed by the loan programme. In view of the large Greek debt, slower growth, further deterioration of the primary balance and lower-than-expected privatisation revenue represent substantial risks looking forward. In a stress scenario on Greek sovereign debt, based on the assumptions that sufficient growth-enhancing structural reforms are not implemented and that fiscal consolidation and privatisation measures are delayed, the debt-to-GDP ratio will be just under 150 per cent by 2020, cf. Chart 7, significantly higher than the 120 per cent of GDP required to ensure the sustainability of the programme. Debt relief and a new rescue package have staved off the immediate financial risks related to the Greek debt situation. The macroeconomic risks remain significant – e.g. in light of the experience gained so far with the slow implementation of structural reforms.

GREEK GOVERNMENT DEBT Chart 7



Source: IMF, *Country Report,* 12/57, 2012.

Payments Relating to Online Shopping

Eva Wix Wagner, Payment Systems

INTRODUCTION AND SUMMARY

Online shopping in Denmark has increased significantly in recent years, and Danish consumers are among the most frequent users of this form of shopping by EU standards. Online shopping offers several advantages to consumers, and some goods and services are practically only available online now. Moreover, online shopping has improved the consumers' access to cross-border trading and thus expanded the range of goods and strengthened competitiveness.

Secure and efficient payment is essential in order to exploit the advantages of online shopping. In Denmark, most online purchases are paid for with the national debit card, the Dankort. This is an easy and fast payment method, as the consumers only have to enter the information stated on the card and not identify themselves via a code. However, this also heightens the risk of loss due to fraud, which must be borne by the shop for amounts exceeding kr. 1,000, while the consumer is usually indemnified regardless of the size of the amount.

Other online payment methods offer higher security against fraudulent use of the payer's identity. This applies to e.g. online banking payments, which require the consumer to use a login. In Denmark, the largest banks have developed their own online banking solutions, but they can only be used if the consumer and the shop are customers of the same bank. Moreover, a common solution exists, called the eDankort, which is provided by all Danish banks, but the use of it is very limited.

Another solution that could enhance the security of online payments is the introduction of a code for card payments. Visa and MasterCard have introduced such a feature, called 3D Secure. Fraudulent use of payment cards has subsequently declined in several countries though the volume of payments has increased. However, the downside has been a more tedious payment process, which is the reason why several shops have hesitated to introduce 3D Secure.

In recent years, international and national authorities in the EU have been actively involved in promoting secure online payment methods. The European Central Bank, ECB, has established the European Forum on the Security of Retail Payments (SecuRe Pay), which is intended to

coordinate the authorities' efforts in this area. SecuRe Pay is currently working on recommendations to enhance the security of online card payments and online banking payments.

In step with technological advances, international authorities' recommendations for measures to prevent fraud in connection with online payments are expected to become stricter in the coming years. It may e.g. be recommended to use codes that are changed on each payment as is the case with NemID.[1] The extent of fraudulent use of the Dankort for online payments is currently modest, but it should be subject to ongoing assessment whether the security requirements should be increased to match international recommendations.

ONLINE SHOPPING IN DENMARK

The extent of online shopping in Denmark has increased significantly in recent years. No official statistics have been compiled, but from 2007 to 2011, the number of online Dankort payments grew by 15.8 per cent annually on average. In the same period, the number of card payments at point of sale rose by 8.7 per cent annually.

According to the Danish E-business Association, FDIH, Danish online shopping in 2011 amounted to kr. 46 billion, of which foreign online shops accounted for kr. 9 billion.[2] Based on data from Statistics Denmark, total retail sales are estimated at kr. 281 billion for the same year. However, the two figures are not directly comparable, as they cover different types of goods and services.

Growth in online shopping is also reflected in the share of Danish consumers who regularly shop on the Internet. This share rose sharply from 2008 to 2011, cf. Chart 1. This particularly applies to the 40-59 age group and the 60-74 age group, who are also assumed to spend the largest amounts. The 20-39 age group still constitutes the largest group of online shoppers.

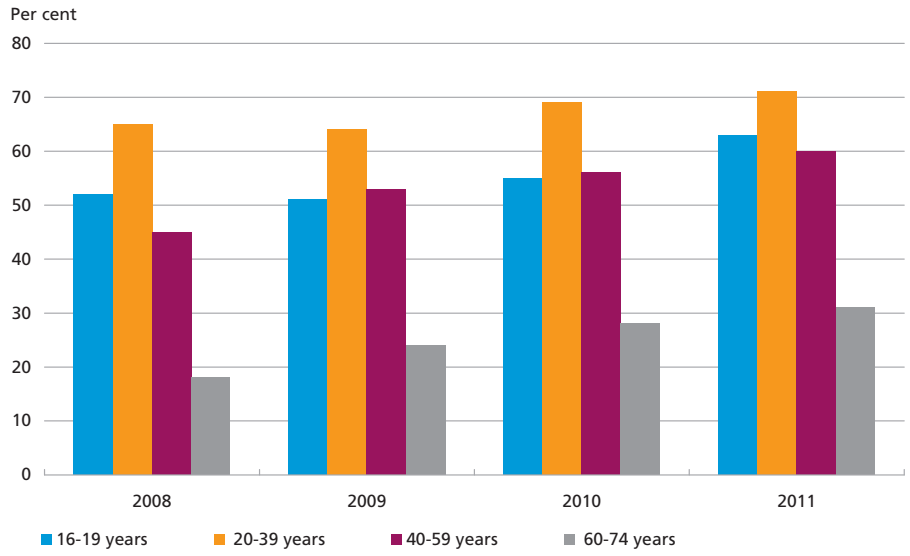
Moreover, Danish consumers increasingly make purchases in foreign online shops. According to data from Statistics Denmark, the share of consumers who have bought goods or services from an online shop in another EU member state over a year rose from 34 per cent in 2008 to 40 per cent in 2011. The proportion of consumers who have made purchases in an online shop outside the EU over the past year has also increased.

---

1 NemID is a digital signature that enables a one-login for public and private services online in Denmark.

2 See FDIH (2011).

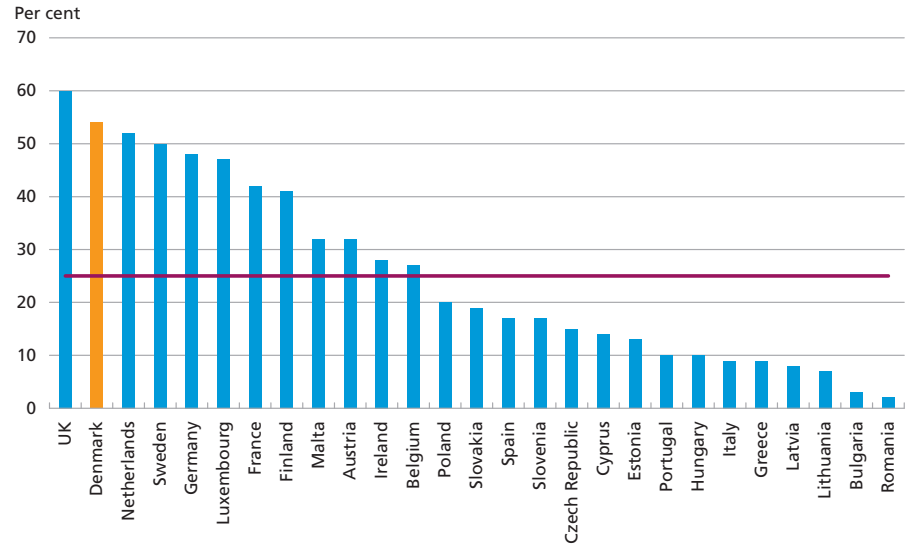
SHARE OF THE DANISH POPULATION SHOPPING ONLINE Chart 1



Note: The chart shows the percentage of the population making online purchases over the past three months.
Source: Statistics Denmark.

The categories of goods accounting for the largest share of turnover in Danish online transactions are tickets for entertainment, such as theatres, concerts and cinemas; services related to holidays, such as air travel, hotel accommodation and car rentals; clothing as well as sports

SHARE OF THE EU MEMBER STATES' POPULATION SHOPPING ONLINE IN 2010 Chart 2



Source: Eurostat.

and leisure goods.[1] Other categories of goods also accounting for a significant turnover are electronics, films, music and books. So far, online purchases of groceries have been very limited, but have been on an uptrend in recent years.

Compared with other EU member states, Danish consumers are among the most frequent online shoppers, cf. Chart 2, only surpassed by UK consumers. Generally, online shopping is more widely used in Northern European countries – such as the two mentioned above, the Netherlands, Sweden and Germany – than in the rest of the EU.

PAYMENT METHODS

The following describes the most frequently used online payment methods in Denmark. Most payments in Danish online shops are made with cards. For 2011, this share is estimated at around 87 per cent of all online payments, most of which were effected with a Dankort, cf. Chart 3. The remaining payments were made via e.g. the payer's online banking facility or by withdrawals from pre-paid funds deposited in an electronic account.

Payment cards

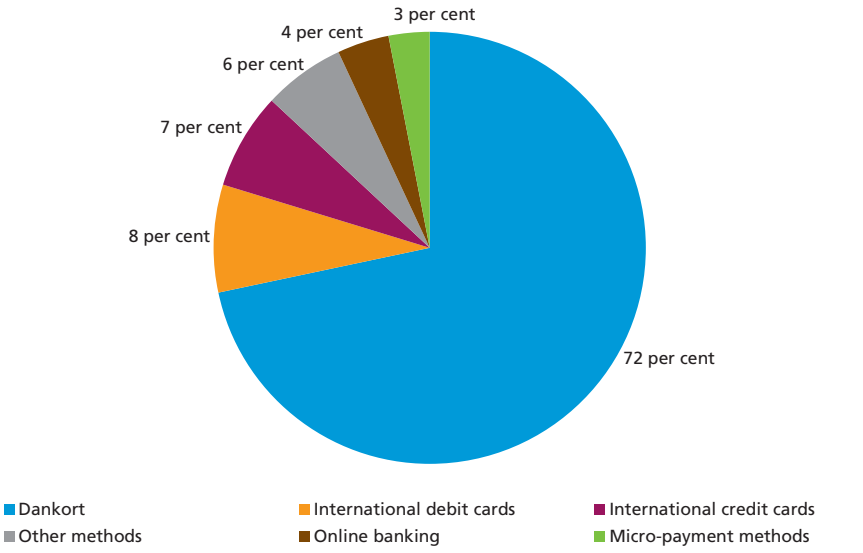
Online card payments other than Dankort payments are primarily made with international debit and credit cards. Debit cards, such as Visa Electron and MasterCard Debet, have a balance control feature, unlike credit cards, such as MasterCard, American Express and Diners Club, for which the money is not withdrawn until a while after the purchase, typically once a month.

Basically, there is no difference between the cash flows of an online card payment and a payment at a point of sale, cf. Box 1. But payment execution differs, as the consumer does not have to enter a PIN in connection with an online purchase, but the data stated on the card, i.e. card number, expiry date and a three-digit card security code, cvc code. Furthermore, in connection with payments with other cards than the Dankort, payers may be requested to verify their identity by using yet another code, cf. below.

Information about a purchase made with a payment card must be passed on from the online shop to the acquirer, e.g. Nets. This is executed via a payment gateway, which is comparable with card terminals at points of sale. In Denmark, the largest supplier of payment gateways

[1] See DIBS (2011).

DANISH CONSUMERS' CHOICE OF PAYMENT METHOD FOR ONLINE SHOPPING — Chart 3



Note: Micro-payment methods comprise PayPal. Other methods include payment via invoices, payment on delivery and payments via mobile telephones.
Source: Own calculations based on DIBS (2011).

is DIBS Payment Services, which operates in several countries, but there are also other suppliers of this service, including Quickpay and ePay.

Other companies offer services that enable consumers to store their card information in a virtual wallet for transactions in various online shops. One such example is Google Wallet, and PayPal offers a similar product. When using a virtual wallet, the consumers only have to give their card information to one single provider, and they need not enter it again when they make purchases in different online shops.

CASH FLOW FROM CARD PAYMENTS — Box 1

The cash flow is the same for an online card payment and a card payment at a point of sale, but varies between Dankort payments and payments with international cards, such as Visa or MasterCard.

In the case of a *Dankort payment*, the exchange of money between the consumer's and the retailer's banks is usually executed during the night after the payment has been made. The money is debited to the consumer's account on the payment date and is credited to the retailer's account the following day.

In the case of payment with an *international card*, the money is held by a third party in the form of the acquirer, e.g. Nets' subsidiary Teller, which receives it from the consumer's bank immediately after the payment has been executed. How quickly the retailer receives the money depends on its agreement with the acquirer.

Online banking solutions

Another way of paying for online purchases is to use one's online banking facility. When using this option, the consumers are directed from the website of the online shop to their own online banking facility. Here they log in using their own NemID code and are met with a screen specifying the payee and the amount to be paid. The consumer executes the payment by validating this information.

A few Danish banks have developed their own online banking solutions for online payments. These are Danske Netbetaling and Nordea e-payments. However, to gain access to these facilities, both the consumer and the online shop need to be customers of the same bank. This limitation illustrates the disadvantages that may arise from developing solutions outside the banks' common infrastructure.

Nets and the Danish banks have developed the eDankort, which can also be seen as an online banking solution, cf. Box 2. As all banks provide the eDankort, the consumers and the online shops do not have to be customers of the same bank. The eDankort gives the shops a higher degree of payment security than ordinary Dankort payments, but is considered to be a more tedious payment method for the consumer. The use of the eDankort is currently very limited.

The eDANKORT AND FOREIGN ONLINE BANKING SOLUTIONS — Box 2

The eDankort was introduced in 2003 with a view to increasing online payment security. When payments are made with the eDankort, the payer's identity is verified via a login to the online banking facility. As for the physical Dankort, Nets is the acquirer of eDankort payments, meaning that Nets concludes agreements with the retailers to receive payments made with this card. The retailers are guaranteed an amount of up to kr. 4,000, while the guarantee for ordinary Dankort payments made online is kr. 1,000.

The use of eDankort has been very limited and even declining in recent years. In 2011, only 32,854 payments were executed compared with more than 50 million online payments with the physical Dankort. The modest use of the eDankort may partly be attributable to the relatively low number of retailers offering this payment solution, which is surprising. One explanation could be that the retailers believe that eDankort payments are tedious for the customers and therefore give up the higher guarantee in expectation of higher sales. For the customers, it is of no financial or legal importance whether they use the Dankort or the eDankort.

In other European countries, the banks have developed similar payment solutions more successfully than in Denmark. This is e.g. the case in the Netherlands, where the banks offer customers to pay and receive payments online via iDEAL, which resembles the eDankort. iDEAL has gained a strong foothold and is currently used for around 65 per cent of all online payments in the Netherlands, cf. Chart 4. Germany and Austria have similar solutions, called giropay and eps.

Pre-paid funds

Payments for online purchases can also be effected from an account with pre-paid funds at a server, also known as electronic money or e-money. The most well-known example is probably the PayPal payment solution, which can be used globally and is owned by the online auction company eBay.[1] In Chart 3, this type of payments appears as micro-payment methods.

In Denmark, payments with and issuance of e-money are regulated by the Payment Services and Electronic Money Act. In this context, e-money is defined as money value stored electronically, constituting a claim on and accepted as means of payment by others than the issuer. Usually, distinction is made between card-based e-money, for which the value of the money is registered on the chip of a payment card, and server-based e-money, such as PayPal.

The legislation allows banks and e-money institutions to issue e-money. Moreover, e-money can be issued by firms with a limited permission. This means that the e-money can only be spent in a limited number of shops or amount to less than 5 million euro. The demands under a limited permission are less strict, but the issuer cannot execute cross-border transactions.

There are currently no Danish e-money institutions, and only few issuers of e-money with a limited permission are registered. However, a number of foreign e-money institutions are allowed to execute cross-border trading in Denmark.

Other payment methods

There are other ways of paying for online purchases, such as charge or cash on delivery. In the case of charge on delivery, the customer receives an invoice and perhaps an inpayment form, which can be paid via an online banking facility or at a bank or a post office. This type of payments only accounts for a minor share of total turnover from online shopping and is included in other methods in Chart 3.

Furthermore, online payments via mobile phones are expected to gain ground, notably in step with the wider use of smartphones. This not only applies to the purchase of digital services used with the mobile phone, such as applications and downloads of music and games, but also to the payment of physical goods and services that are not related to the mobile phone.

Today, most mobile phone payments are executed by the consumer sending an overcharged text message, meaning that the purchase is

[1] For a detailed description of PayPal, see Bakkegaard (2010).

settled via the following telephone bill or deducted from pre-paid calling cards. Note that Nets has recently launched a new system for mobile payments, called Mobilpenge, implying that the payment is debited directly to the consumer's bank account.

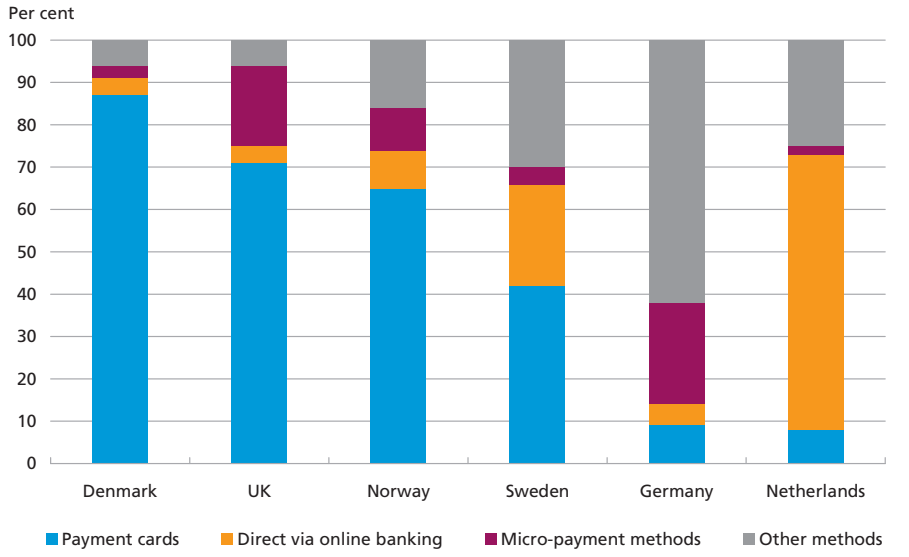
Finally, virtual currencies for online purchases of goods and services have emerged in recent years. Most of them can only be used within the closed environment on the Internet, in which the currency has emerged. Virtual currencies differ from real currencies by not existing in a physical form and not being issued by – i.e. not constituting claims on – central banks.

Payment methods in other countries

Consumers' preferred payment methods for online shopping differ widely between otherwise comparable countries, cf. Chart 4. In no other country with a considerable share of online shopping does card payments account for such a large share of turnover as in Denmark. However, card payments are also widely used in the UK and Norway and to some extent in Sweden.

The Netherlands differs from the other countries, as it has a widely used online banking solution, called iDEAL, cf. Box 2. Like the eDankort, iDEAL is offered by all banks nationwide, meaning that the consumer

CONSUMERS' CHOICE OF PAYMENT METHODS IN SELECTED EUROPEAN COUNTRIES, 2011 Chart 4



Note: Micro-payment methods comprise PayPal. Other methods include payment via invoices, payment on delivery and payments via mobile telephones.
Source: Own calculations based on DIBS (2011) and De Nederlandsche Bank (2011).

and the shop do not have to be customers of the same bank. In Sweden, online banking payments are also relatively common, but via bank-specific solutions.

Germany also has a sector-based online banking solution. However, German consumers prefer other payment methods for their online purchases, primarily charge or cash on delivery. Thus, their online payment pattern largely matches their behaviour at point of sale, where cash is the preferred type of payment.

RISK OF FRAUD VERSUS USER-FRIENDLINESS

Online Dankort payments involve a higher risk of fraud than Dankort payments at point of sale. The reason is that no PIN is to be entered but merely the data stated on the card. A person, who has stolen or copied a Dankort or in any other way has picked up the data on the card, can therefore relatively easily use this data for online purchases.

This type of fraud allows the cardholder to reclaim the amount withdrawn, unless gross negligence is established. This also applies to fraudulent use of the card in a foreign online shop. Generally, consumers enjoy a high degree of protection in connection with online purchases, as they can also require their bank to charge back a payment if the purchased goods fail to arrive.

Losses from online fraud with the Dankort are sustained by Nets, the acquirer of the payments, and the shops. Nets guarantees the shops payments up to kr. 1,000, while the shops have to bear any losses exceeding this amount. For Dankort payments at points of sale, the equivalent guarantee from Nets totals kr. 4,000 if a PIN has been used, reflecting the higher security for these payments.

There is no technical hindrance to using a personal code for online card payments. Visa and MasterCard have introduced a cardholder verification code, called 3D Secure. In Denmark, 3D Secure has been introduced as a password that will not have to be changed and which is to be used with personal data intended to assure the cardholder that the code can be entered without risk of fraud.

A more advanced and secure confirmation of the cardholder's identity than the Danish implementation of 3D Secure is one-off verification. This means that the cardholders identify themselves by a code that changes for each payment and is received via e.g. a text message or a key display. NemID, which is used for login to e.g. online banking facilities and public authorities on the Internet, is based on one-off verification.

However, a personal code also makes is more difficult to make online card payments. The decision to introduce a Dankort code should there-

fore be considered in relation to the extent of fraud. In 2011, reported online Dankort fraud amounted to around kr. 11 million – or 0.03 per cent of turnover. This was a decline compared with the previous year but a larger share than for Dankort payments at point of sale.

STRONGER INTERNATIONAL FOCUS ON FRAUD

In recent years, focus on the importance of secure online payment methods has increased on an international scale. The risk of a larger extent of fraud with this type of payments is that consumers and shops refrain from online transactions. This may mean that some of the advantages of online shopping, such as intensified competition and a larger selection of goods, will not materialise.

No harmonised statistics are available of the extent of fraud with online payments. In the UK, where many online shops are based, fraud has declined since 2008 after a sharp increase in the preceding years. This is partly ascribable to the rollout of 3D Secure. However, payment card fraud on the Internet accounts for approximately half of all card fraud in the UK. In other countries, including France, this type of fraud has increased.

Against this backdrop, several EU authorities have become involved in promoting online payment security. This has primarily been in the form of opinions and recommendations aimed at banks and card companies. Thus, in 2010 the ECB recommended that one-off verification be implemented as a standard solution.[1] In France, the relevant supervisory authority has issued a similar recommendation.[2]

Furthermore, the ECB has taken initiatives to strengthen the cooperation between European authorities on increasing the security of e.g. online payments, including the establishment of SecuRe Pay, intended to coordinate the authorities' efforts and promote harmonised conditions for the providers of payment services. The new forum comprises authorities responsible for monitoring payments and supervising providers of payment services. Danmarks Nationalbank and the Danish Financial Supervisory Authority are the participants from Denmark.

SecuRe Pay is currently working on online card payments and online banking payments. A set of proposed recommendations has been prepared for both payment methods with a view to increasing the security of payments, including confirmation of the payer's identity. The recommendations will be submitted for consultation before they are formally

1 Cf. ECB (2010).
2 Cf. Banque de France (2008).

adopted by the Governing Council of the ECB, which is the supreme body of SecuRe Pay.

Overlay services

A variant of online banking payments, called overlay services, has particularly attracted authorities' attention in recent years. With this method, a third party, the provider of overlay services, acts as intermediate between the online shop and the consumer's online banking facility. The consumer passes on his or her bank account number and online banking login to the service provider, who subsequently executes the payment.

In terms of security, the concept of overlay services raises a number of questions. First of all, it must be established how to avoid subsequent fraudulent use of the consumer's online banking information. Moreover, in the case of fraud the liability for any loss may be uncertain, as it is typically stipulated in the consumer's online banking agreement that this information may not be passed on to a third party. In some cases, the consumer may be totally unaware that overlay services are involved.

However, overlay services also offer advantages, the most obvious being that this type of service provides scope for payment – via the consumer's online banking facility – of goods and services in other countries. This is not possible via the existing online banking solutions in Europe, which can only be used for national payments. On several occasions the ECB has encouraged banks in Europe to develop a pan-European online banking solution, but this work is making slow progress.

Several authorities have officially expressed concern about the increasing use of overlay services. In November 2009, on behalf of the national payments council, the Dutch central bank decided to point out a number of security flaws in this type of payments.[1] The risks associated with overlay services have also been on the agenda of the European Commission's Payments Committee several times in discussions on potential regulation of this type of services in the Payment Services Directive.

Danish consumers making purchases in foreign online shops may be offered payment via overlay services. No incidents have been reported of Danish consumers experiencing fraudulent withdrawals from their accounts via their online banking facilities. In light of the expected growth in cross-border online shopping, it is important that the providers of these solutions are subject to regulation and supervision according to common rules.

---

[1] Cf. De Nederlandsche Bank (2009).

LITERATURE

Bakkegaard, Jesper (2010), New payment instruments, Danmarks Nationalbank, *Monetary Review*, 1st Quarter.

Banque de France (2008), Observatory for payment card security, *Annual Report*.

De Nederlandsche Bank (2009), Serious concerns over new, unsafe Internet payment services, *News Items*, 13 November.

De Nederlandsche Bank (2011), Payments of cross-border online shopping: behaviour, perceptions and desires, results of DNB survey among Dutch consumers, January.

DIBS (2011), A comprehensive study of European e-commerce – a growth opportunity for merchants, *DIBS e-commerce survey*.

ECB (2010), Beyond theory into practice, *SEPA Seventh Progress Report*, October.

FDIH (2011), Dansk e-handelsanalyse, Forbrugerstatistik (Danish e-commerce analysis, consumer statistics – in Danish only), *Annual report*.

Current Trends in the Greenlandic Economy

Anders Møller Christensen and Carina Moselund Jensen, Economics

Greenland was only to a moderate extent affected by the international economic crisis that hit the world economy in 2008. According to the national accounts, economic growth was positive in all years until 2010, which is the last year covered by the statistics. Underlying factors include the block grant from Denmark, which provides a firm source of income, and a fairly stable fishing volume. The Chairmanship of the Economic Council in Greenland estimates economic growth at 3 per cent in 2011, cf. the Economic Council's Report 2011.[1]

Growth in 2010 and 2011 is mainly attributable to considerable construction activity, primarily in Nuuk, and a strong increase in oil and mineral exploration activities. Furthermore, incomes were boosted by rising world market prices for the predominant export industry, fisheries, in 2010 and into 2011, which means that finances in this industry have generally improved substantially. At the same time, previous years' steady deterioration of terms of trade ceased.

There is a considerable risk that economic activity will decline in 2012. Prawn fishing plays the economically most important role in the Greenlandic fishing industry. Prawn quotas have been reduced by almost 20 per cent, and oil exploration activities will be somewhat lower than in 2011 as no exploratory drillings have been planned in the waters off western Greenland this year. A potential increase in mineral exploration activity is scarcely able to make up for this.

National accounts

In December 2011, Statistics Greenland published output-based national accounts for the years 2003 to 2010. This makes it possible to produce more or less the same tables and analyses as for most other economies. Highlights of demand and supply are shown in Table 1.

It is clearly seen that there has been a pronounced surge in investment, which in 2010 constituted more than 50 per cent of the gross domestic product, GDP. A large part of this growth relates to investments in oil and mineral exploration, in the national accounts referred to as in-

[1] See htpp://dk.nanoq.gl/Emner/Landsstyre/Departementer/Departement_for_finanser/OekonomiskRaad.aspx (in Greenlandic and Danish only).

DEMAND AND SUPPLY, REAL GROWTH Table 1

Per cent	(Share of GDP 2010)	2004	2005	2006	2007	2008	2009	2010
Private consumption	(51.1)	6.3	5.2	3.1	-1.1	-1.1	0.3	4.4
Public consumption	(53.8)	-0.1	0.5	6.6	1.0	6.7	-2.7	-0.3
Total gross investment	(55.1)	-7.2	41.7	2.1	35.1	45.1	-4.2	33.3
Excl. investment in intangible fixed assets	(27.0)	-8.5	37.9	3.1	24.0	36.3	0.8	-17.7
Exports of goods and services	(27.9)	12.7	2.9	-3.5	-1.4	10.6	-12.9	6.5
Final consumption equal to total addition	(188.0)	3.8	7.1	2.6	4.7	12.3	-4.2	10.2
Imports of goods and services	(88.0)	3.0	12.6	-3.5	8.7	26.8	-10.6	23.3
Gross domestic product	(100.0)	4.3	3.7	6.6	2.4	3.0	0.8	1.2

Note: Investment in intangible fixed assets mainly comprises investments relating to oil and mineral exploration.
Source: Statistics Greenland.

vestment in intangible fixed assets. This includes e.g. costs for oil exploration in the sea off the west coast of Greenland. Most of these investments are made by foreign companies using foreign labour on foreign drilling and supply vessels and are offset by large imports of services in the national accounts. But there is a small impact on Greenland's GDP to the extent that local firms are involved, and the activities also provide tax revenue for Greenland.

Growth has also been high in more traditional areas of investment. There has been considerable construction of housing, student residences and places of education, particularly in Nuuk, and hydropower capacity has been expanded. Within a few years, hydropower will be the main source of energy for the largest Greenlandic towns. In addition, very large investments have been made in the telecommunications infrastructure in the form of submarine cables linking Greenland to both Canada and Iceland.

FACTS ABOUT GREENLAND

Population (number of people, beginning of 2012)	56,749
Of which in Nuuk (capital)	16,181
Population aged 18-66 years	38,469
Employment[1] (2010)	28,386
Unemployment[2] (2010)	2,412
Gross domestic product (kr. billion, 2010)	12.3
Per capita (kr. 1,000)	217.5
Disposable gross national product (kr. billion, 2010)	16.1
Per capita[3] (kr. 1,000)	285.2

Source: Statistics Greenland and own calculations.

[1] Number of people in primary employment, average of monthly data, approximate ILO definition.

[2] Number of people affected by unemployment, average of monthly data.

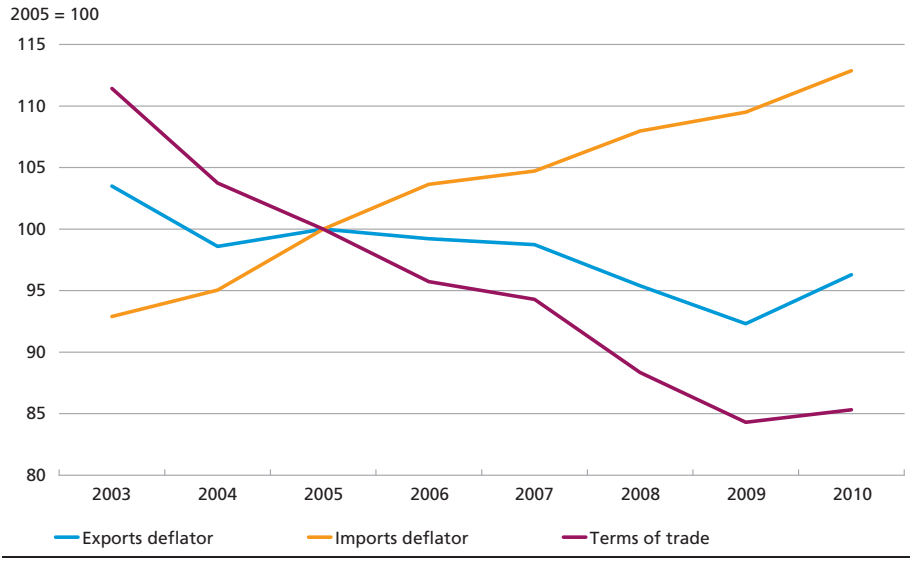
[3] By comparison, disposable GNP per capita in Denmark was approximately kr. 317,100 in 2010. Disposable GNP was approximately 0.2 per cent higher than GDP.

Both public and private consumption have moved more or less in parallel with consumption in Denmark since 2003, but with somewhat larger fluctuations in growth from year to year, mainly because the economy is less diversified and hence more dependent on fluctuations in e.g. fisheries than the Danish economy. The sum of public and private consumption exceeds Greenland's GDP, which is possible because of transfer income from abroad in the form of block grants from the Danish government and agreements with the EU. This means that Greenland's disposable gross national product is more than 33 per cent larger than its GDP.

It is a cause for concern that exports of goods and services have been stagnating in recent years. This has led to very large deficits on the balance of goods and services in the national accounts since imports have been rising steadily, even if the previously mentioned large import content in oil and mineral exploration is disregarded.

While exports have been more or less stable since 2004, imports at constant prices have risen considerably since 2003. Add to this a very unfavourable development in terms of trade, in that export prices have been stagnant or falling, while import prices have been rising steadily, cf. Chart 1. If export prices had risen at the same rate as import prices, so that the terms of trade had been unchanged during this period, the value of Greenlandic output in 2010 would have been just over kr. 1 billion higher than the actual value, corresponding to 8.5 per cent.

EXPORTS AND IMPORTS DEFLATORS AND TERMS OF TRADE — Chart 1



Source: Statistics Greenland.

Balance-of-payments statistics for Greenland are not yet available, but there can be no doubt that economic growth in recent years has been loan-financed to a large extent, cf. the section on loans and bank deposits.

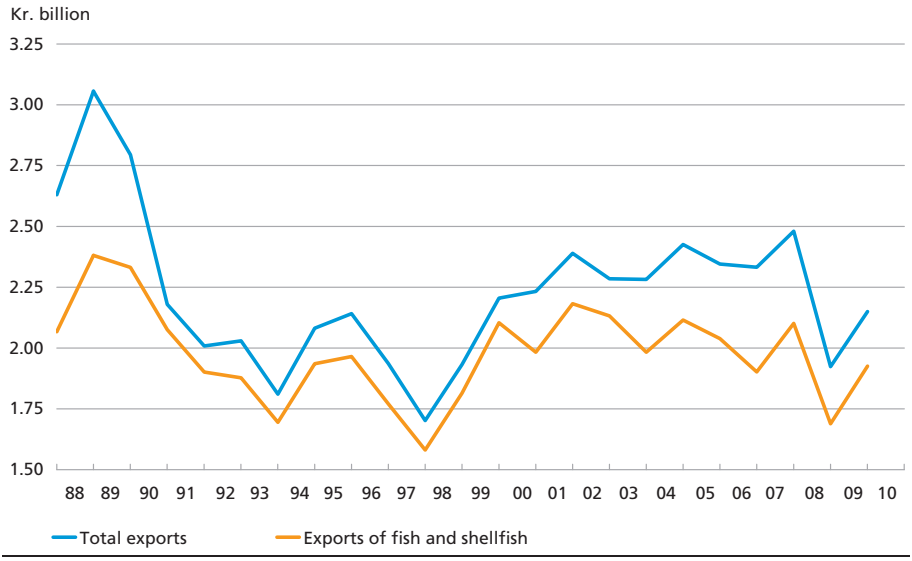
Balance of trade

In 2010, Greenland's balance of trade showed a deficit of kr. 2.4 billion, corresponding to almost 20 per cent of GDP, the largest deficit ever. Exports of goods totalled kr. 2.1 billion, while imports totalled kr. 4.5 billion. But in the first nine months of 2011, the trade deficit was kr. 450 million lower than in the same period of 2010, reflecting higher prices for fish and shellfish.

In a long-term perspective there is a structural problem in that no new export industries have been developed to supplement fisheries. Exports of fish and shellfish fluctuate somewhat from year to year, but the export value is roughly the same now as 20 years ago, cf. Chart 2. Now, as then, fisheries account for approximately 90 per cent of Greenlandic exports.

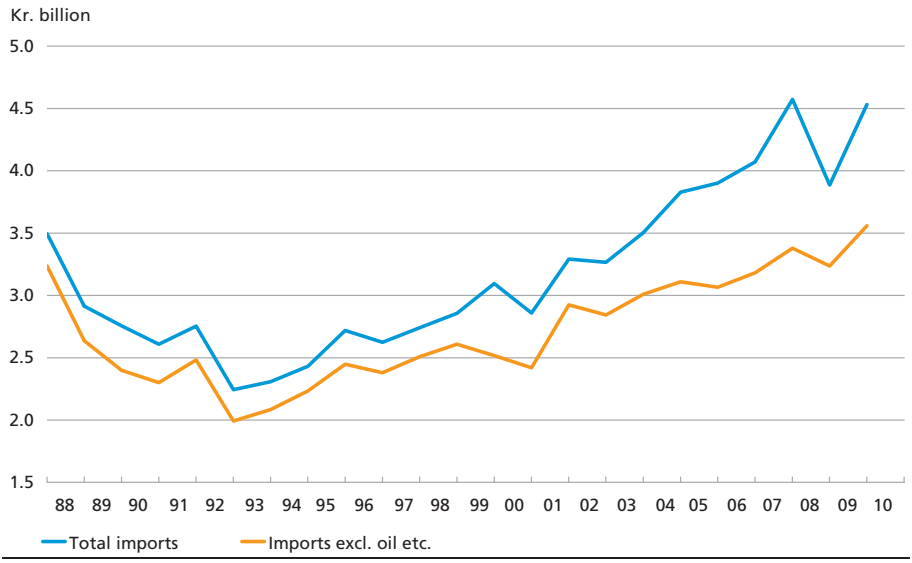
The possibilities for developing fisheries must be deemed to be limited as volumes are on the high side from a long-term sustainability perspective according to the biologists' advice. In accordance with the advice, prawn quotas have been reduced in 2012, and further reductions are expected in 2013, cf. the section on fisheries.

EXPORTS Chart 2



Note: Preliminary data for 2007-10.
Source: Statistics Greenland.

IMPORTS Chart 3



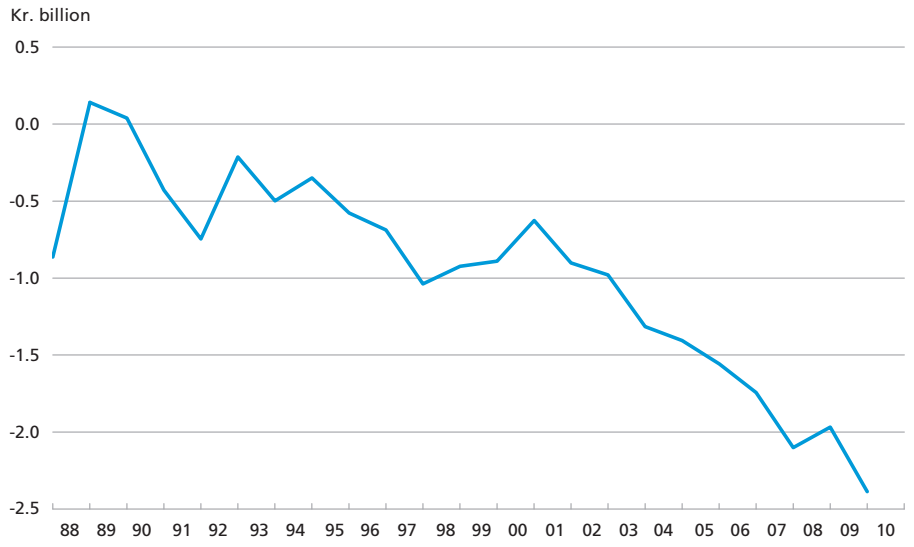
Note: Preliminary data for 2007-10.
Source: Statistics Greenland.

Hence it is a serious concern that no new export sectors have been developed. Tourism has shown some development, and, in particular, a number of oil and mineral exploration activities are being carried out, but so far this has not led to increased extraction. In one case, the olivine mine at Maniitsoq, commenced activities were closed down again. On the other hand, the gold mine in South Greenland reopened in 2011 with approximately 80 employees. This will contribute to export earnings in late 2011 and into 2012.

Imports of goods have risen at a steady pace, reflecting the general trend in activity, cf. Chart 3. Most goods for investment and private consumption are imported. 2010 saw particularly high growth in the value of imports of energy goods and office machines, etc., while imports of consumer goods fell slightly.

As a result of the stagnating exports and steadily rising imports, Greenland's trade balance has shown large and increasing deficits in recent years, cf. Chart 4. The deficits on the trade balance and, not least, the balance of goods and services have grown, while Greenlandic residents have increased their net debts via loans from banks and mortgage banks, cf. the section on loans and bank deposits. This is consistent with net borrowing corresponding to the sum of capital transfers and the current account of the balance of payments. As stated above, no statistics are available yet of the balance of payments or Greenland's net foreign debt and how they are developing.

TRADE BALANCE Chart 4



Note: Preliminary data for 2007-10.
Source: Statistics Greenland.

Private consumption

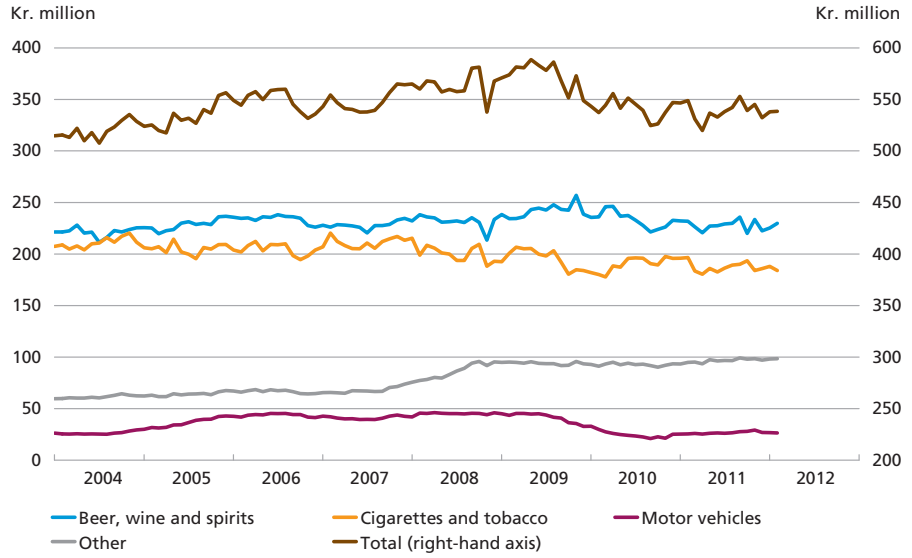
The most important economic indicator for private consumption is the Greenlandic government's monthly statement of revenue from excise duties.

Given that excise duties have been unchanged since the autumn of 2007, changes in revenue reflect changes in private consumption of the relevant categories of goods. As Chart 5 shows, revenue has declined since 2009, chiefly reflecting lower sales of alcohol and tobacco as well as cars. The fall in revenue from tobacco and alcohol taxes continued in 2011, while other areas of consumption were more or less constant. In this context it should be noted that sales of tax-free tobacco and alcohol before arrival in Greenland were discontinued in 2011, so the development in consumption has been a little weaker than the revenue from taxes indicate.

Loans and bank deposits

Private individuals, firms and the public sector mainly bank with the two locally represented banks, Grønlandsbanken and BankNordik, but it is not unusual to have a bank account in Denmark. The Danish mortgage banks have also increased their activities in Greenland in recent years. So in order to illustrate developments in the Greenlandic population's deposits and loans, the Danish banks and mortgage banks must also be taken into consideration.

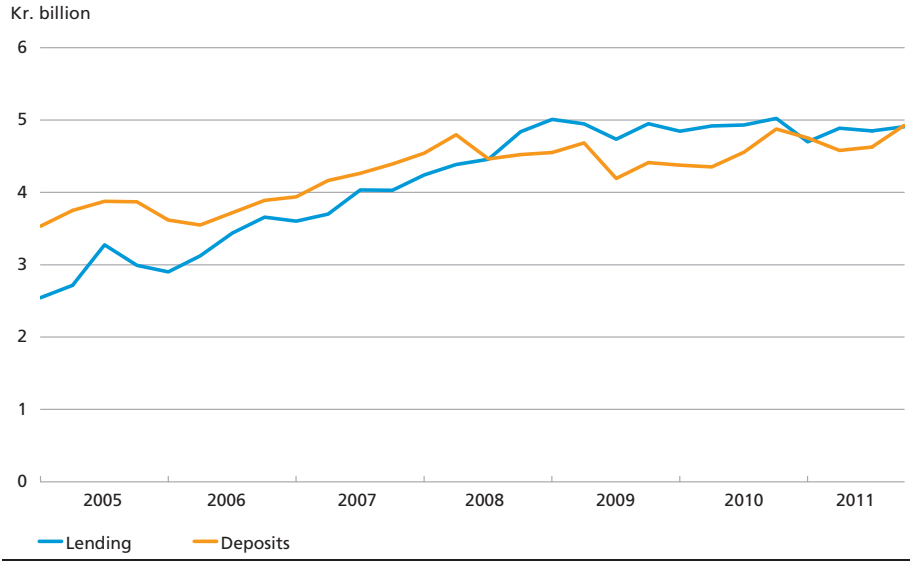
IMPORT DUTIES Chart 5



Note: 12-month sums. The most recent observations are from February 2012.
Source: Greenlandic government.

Chart 6 shows that residents in Greenland have gone from having a customer funding surplus of approximately kr. 1 billion in 2004 with banks in the Danish currency area – Denmark, the Faroe Islands and Greenland – to having more or less balanced loans and deposits. During

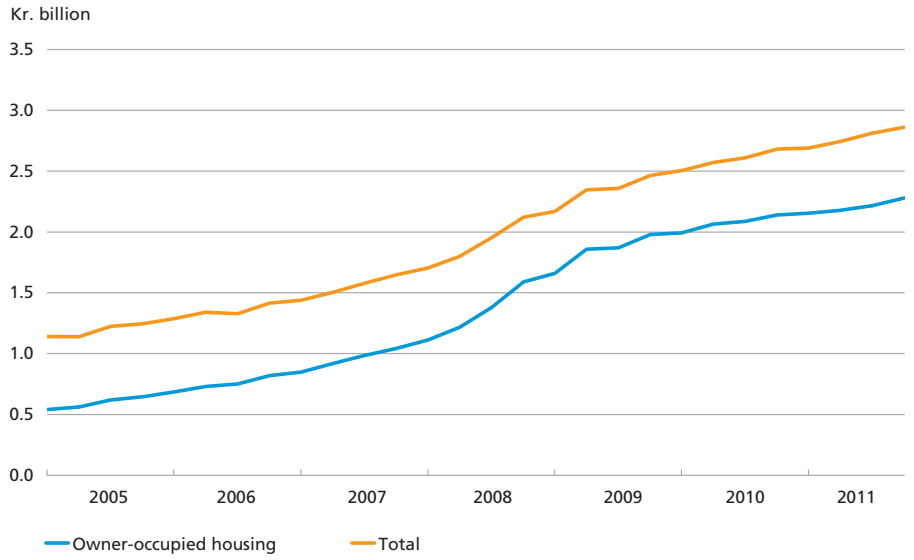
BANKS' LENDING TO AND DEPOSITS FROM GREENLAND Chart 6



Note: The most recent observations are from the 4th quarter of 2011.
Source: Danmarks Nationalbank.

MORTGAGE BANKS' LENDING TO GREENLAND BROKEN DOWN BY PROPERTY CATEGORIES

Chart 7



Note: The most recent observations are from the 4th quarter of 2011.
Source: Danish Financial Supervisory Authority.

the same period, mortgage banks have increased their outstanding loans in Greenland from around kr. 1.2 billion to around kr. 2.9 billion, cf. Chart 7. This is attributable to a greater prevalence of owner-occupied housing, as well as a declining tendency for rental housing to be funded directly by the government and local authorities. All mortgage loans are fixed-rate loans with amortisation, and the mortgaged properties may only be situated in Nuuk or a few other towns. As the figures show, net lending to Greenland from the previously mentioned sources has risen by approximately kr. 3 billion in seven years. Moreover, in the autumn of 2010, the government raised a loan of kr. 250 million from the Nordic Investment Bank, NIB, for partial financing of a hydroelectric power plant. This loan is not included in the statistics.

Hence, the statistics support the view that economic growth has been loan-financed in recent years, particularly in relation to construction activities in Nuuk. To provide a balanced picture, it should be noted that total gross lending has now increased to around 65 per cent of GDP, which is far lower than in Denmark, where the corresponding figure is around 200 per cent.

Immigration and emigration

Recent years have seen net immigration of people born outside Greenland, cf. Chart 8. At the same time, net emigration of people born in

NET IMMIGRATION Chart 8

Source: Statistics Greenland.

Greenland has been somewhat lower than in the period 2005-08. Since the excess of births in Greenland, i.e. the difference between the number of births and deaths, is around 400 p.a. these years, the population has been rising slightly. A main reason is that the job situation in Denmark has deteriorated, so vacancies in Greenland are filled more rapidly than previously. As a result, some functions are now carried out by people living in Greenland instead of short-term temporary staff, as was previously common, especially within healthcare. This in turn will reduce costs per treatment and hence ensure a better quality of public consumption than previously for a given amount in kroner.

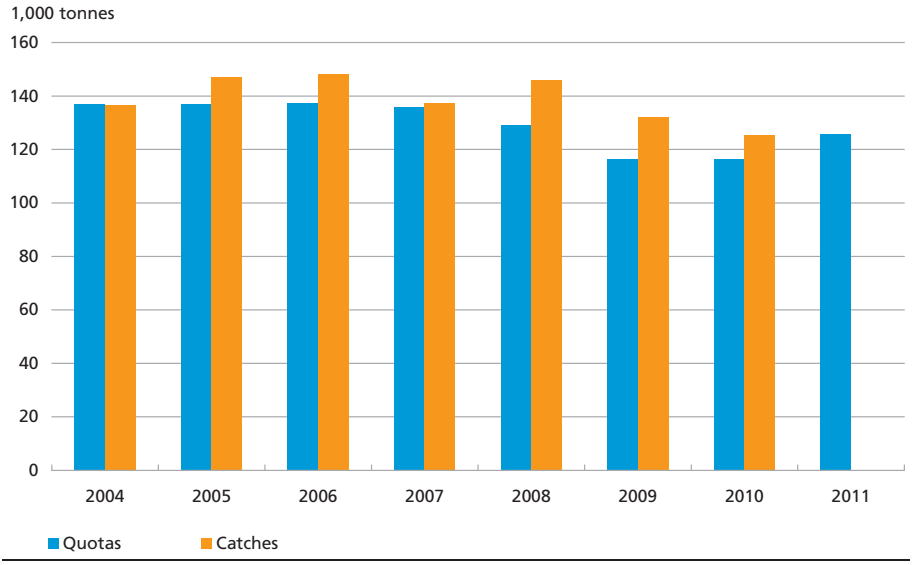
The increase in raw materials exploration in Greenland could be another reason why people born outside Greenland take up permanent residence. However, most exploration activities are carried out in the summer months by non-residents.

Given the close ties between the Danish and Greenlandic labour markets, the reversal of net migration flows is, at any rate, an indication that economic growth has been stronger in Greenland than in Denmark in recent years.

Fisheries

Prawn fishing plays the most important role in an economic context. Prawn quotas and catches have fluctuated around 120,000 tonnes in

GREENLANDIC VESSELS' QUOTAS AND CATCHES OF PRAWNS Chart 9



Note: Due to the flexible quota system, catches may legally exceed the quotas in some years.
Source: Greenlandic Ministry of Fisheries, Hunting and Agriculture.

recent years, cf. Chart 9. Due to rising world market prices in 2010, prawn fishing has become a profitable business.

In accordance with the biologists' advice, quotas have been reduced by almost 20 per cent in 2012, and further reductions are expected in 2013. Underlying factors include a falling biomass and an increase in the volume of small, prawn-eating cod. However, the cod are still too small to provide profitable fisheries by way of compensation.

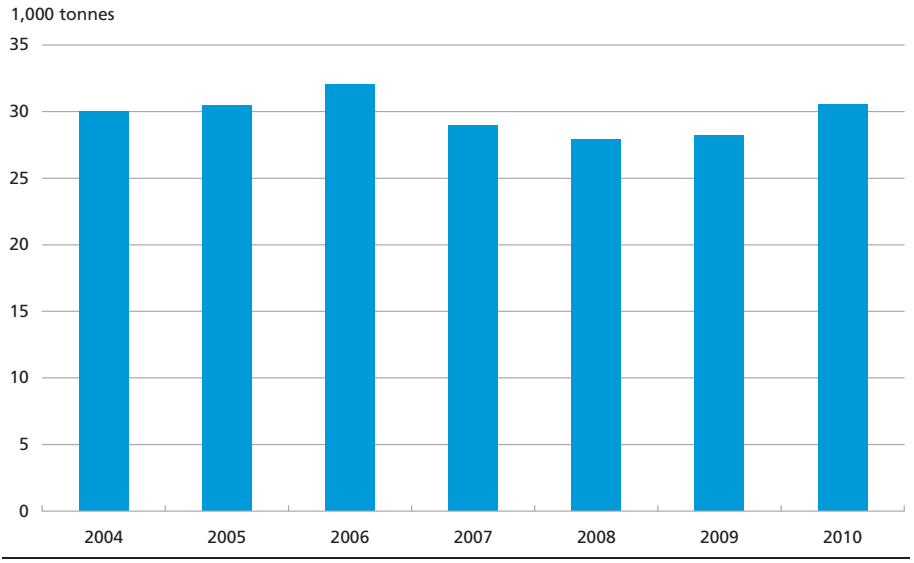
Catches of Greenland halibut – economically the second most important species – have been stable for some years, cf. Chart 10. It is hardly possible to increase catches if fisheries are to remain biologically sustainable.

Extraction of raw materials

Fisheries are set to decline in the coming years, which emphasises the need to develop other industries. This need has been apparent for some years, but a high level of costs, more or less matching that of Denmark, a geographically scattered population with resultant high transport costs and a lower level of education impede such developments. Extraction of raw materials looks like the most probable supplement to fisheries.

Considerable exploratory activities have taken place in recent years. Especially exploratory drillings for oil in the sea off western Greenland have attracted attention. Costs in this respect totalled around kr. 5 billion for 2010 and 2011. Most of the exploration is carried out using

GREENLANDIC VESSELS' CATCHES OF GREENLAND HALIBUT Chart 10



Source: Greenlandic Ministry of Fisheries, Hunting and Agriculture.

foreign labour and foreign capital stock, but a number of service sectors in the towns in question have seen a boost in activity. Traces of hydrocarbon have been found, but so far not in quantities that would provide a basis for extraction. Activities are set to decline considerably in 2012 as no exploratory drillings have been planned for this year. However, further drillings are expected in the coming years.

As regards minerals, there has also been considerable exploratory activity for a number of years, and some firms are currently investigating the profitability of extracting the finds. These include "rare earth elements" in southern Greenland, iron near the Godthåb Fjord, rubies south of Nuuk and zinc in northern Greenland. The level of activity is expected to be high in these areas this year.

There are also plans to utilise some of the large, unexploited hydropower resources for supplying an aluminium smelter at Maniitsoq with energy. The hydroelectric power plant and aluminium smelter would entail investments in the range of kr. 20 billion, to which should be added investments in urban development for those employed in the operations phase. In its spring session 2012, Inatsisartut, the Greenlandic parliament, will determine the degree of risk that Greenland is able to take on in connection with large-scale projects.

If the aluminium project and some of the large mining projects are realised, this will provide employment for several thousand people in the establishment phase and some thousands in the extraction phase. In

a country with a labour force of around 30,000, this will considerably increase the opportunities for finding well-paid employment. It is probably unrealistic that the investment phase can be completed mainly using local labour, but it is essential to developments in Greenland that the labour used in the operations phase is local to the extent that this is possible. That will require a substantial effort to raise the level of education in Greenland, where less than half of the population over the age of 25 has completed a qualifying education or training or is currently doing so.

However, all this should be taken with a grain of salt. For a number of years, there have been great expectations for future mining activities, etc., but so far they have not been met. Currently the only active mine is a gold mine in southern Greenland employing approximately 80 people.

Public finances

In the period 2007-09, the Greenlandic government had a deficit on its current, investment and lending budget, CIL. The budget balanced in 2010, but the Finance Acts for 2011 and 2012 show new CIL deficits, cf. Table 2.

The deficits are in part attributable to lending to the energy supply company Nukissiorfiit in connection with the ongoing conversion of the largest towns' energy supplies to hydropower. These investments will not only reduce oil consumption, they are also deemed to be profitable on market terms, but they have increased lending expenses by kr. 2-300 million p.a. since 2007. The Finance Act for 2012 operates with a balanced current and investment budget, CI.

When assessing the impact of public finances on activity, it is also necessary to look at the Construction and Renovation Fund. When a capital expenditure is approved, it is charged to the investment budget, and the amount is transferred to the Fund. When the project is carried out, often in subsequent years, it is financed via disbursements from the Fund. So an increase in the Fund's capital indicates that investment activity has been lower than projected in the CIL balance. Conversely, investment activity in 2010 was kr. 245 million higher than the investment expenses of kr. 719 million.

Income is dominated by the category agreed income, of which the block grant from the Danish government constituted just over 90 per cent in 2010. The size of the block grant is specified in the Act on Greenland Self-Government and is indexed by the annual increase in the general price and wage index over the Danish Finance Act. If the Greenlandic government's expenses increase in real terms, a budget-balance requirement means that other sources of income must increase by a

MAIN ITEMS OF THE GOVERNMENT ACCOUNTS Table 2

Kr. million	2005 R[1]	2006 R[1]	2007 R[1]	2008 R[1]	2009 R[1]	2010 R[1]	2011 PL[2]	2012 PL[2]
1. Operational expenses	2,404	2,462	2,604	2,787	2,973	3,078	2,778	2,901
2. Statutory expenses ..	740	750	788	837	850	852	890	885
3. Subsidies	1,674	1,532	1,530	1,591	2,229	1,534	1,840	1,881
4. Investment expenses	492	700	1,003	930	807	719	937	946
5. Total expenses	5.311	5.444	5.925	6.144	6.860	6.184	6.445	6.613
6. Agreed income[3]	3,430	3,485	3,555	3,661	3,799	3,828	3,883	3,936
7. Direct taxes	786	780	850	876	828	1,019	909	1,004
8. Indirect taxes.....	664	703	740	792	776	772	847	851
9. Other revenue.....	705	517	514	496	506	567	606	600
10. Total income	5,585	5,484	5,659	5,825	5,910	6,185	6,245	6,391
11. Actual CIL balance: (10)-(5)	274	40	-267	-318	-950	2	-200	-221
12. CI balance	304	65	-28	-94	-514	207	13	0
13. Net lending to Nukissiorfiit	30	25	239	223	132	223	281	263
14. Increase in unused funds in Construction and Renovation Fund	14	-19	148	95	60	-245	-100	-100
15. CIL balance adjusted (11)+(13)+(14)	318	46	120	0	-758	-21	-19	-58

Note: In 2011, block grants to local authorities were increased by kr. 302.6 million as care for the disabled was transferred to local authorities. Hence, this amount is transferred from the Greenlandic government's operational expenses to expenses for subsidies.

Source: Government Accounts, Finance Acts (FL) 2011 and 2012.

[1] Realised data.

[2] Preliminary data.

[3] Agreed income mainly comprises the block grant from the Danish government (kr. 3,495 million in 2010) and partnership and fisheries agreements with the EU (kr. 221 million in 2010).

higher percentage than expenses if inflation is at the same level in Greenland as in Denmark. Since the same currency is used, this is usually the case.

Owing to pressure on expenses as the population ages in the coming decades, combined with the fact that a dominant source of income is frozen in real terms, the Economic Council in its report assesses fiscal policy to be unsustainable in the long term. A fiscal indicator has been calculated which shows that tightening by almost kr. 1 billion is required to keep the government debt stable up to 2040. This calls for a considerable effort since public operating expenses, including at local level, total around kr. 6 billion.

Greenland has a favourable point of departure in that the government has net financial assets. At end-2010, gross debt was kr. 250 million, corresponding to approximately 2 per cent of GDP, while liquid assets in

the form of bank deposits and bonds totalled approximately kr. 1 billion. However, liquid assets have shrunk considerably in recent years. At end-2007, the government held liquid assets of more than kr. 2 billion. The government holds a number of other assets which have not been included in this calculation, including housing loans. Many of these loans are without interest and amortisation for a number of years and hence difficult to value.

The 2012 Finance Act budgets with the government raising further loans of kr. 800 million until 2015.

However, the favourable debt picture so far is complicated by the fact that firms wholly owned by the Greenlandic government at end-2010 had interest-bearing gross debts of kr. 3.6 billion, of which kr. 2.3 billion related to Royal Greenland A/S.

Looking further ahead, a large number of infrastructure projects are required. The Transport Commission, which was set up after the transition to self-government in the summer of 2009, submitted a report in the winter of 2011. The calculated capital requirements for new or improved airports and extended port facilities amount to at least kr. 2-3 billion. In addition, considerable residential construction will be required in Maniitsoq if the plans to build an aluminium smelter are realised. The list of investment wishes is long, and it will be necessary to prioritise the proposals according to their importance to the economy. It will also be a challenge to avoid overheating of the economy.

Working Papers Issued

Press Releases

15 DECEMBER 2011: INTEREST RATE REDUCTION

Effective from 16 December 2011, Danmarks Nationalbank's lending rate and the interest rate on certificates of deposit is reduced by 0.10 percentage point to 0.7 per cent and 0.3 per cent respectively. The current account rate is reduced by 0.05 percentage point to 0.25 per cent. The discount rate is maintained at 0.75 per cent.

The interest rate reduction follows Danmarks Nationalbank's purchase of foreign exchange in the market.

Effective from the above date, Danmarks Nationalbank's interest rates are:

Lending rate: 0.7 per cent.
Certificates of deposit: 0.3 per cent.
Current account: 0.25 per cent.
Discount rate: 0.75 per cent.

9 JANUARY 2012: COMMEMORATIVE COIN TO MARK THE 40TH JUBILEE OF HER MAJESTY QUEEN MARGRETHE II ON 14 JANUARY 2012

In Denmark there is a long-standing tradition to issue commemorative coins to mark special events in the Royal Family. The Queen's 40th jubilee on 14 January will therefore be marked with the issue of a commemorative coin in three different versions.

A 3000 krone gold coin with a diameter of 22 mm and a weight of 8.65 g is minted as well as a 500 krone silver coin with a diameter of 38 mm and a weight of 31.1 g. For ordinary circulation a 20 krone coin is minted in 750,000 copies. Additionally a 20 krone coin in a very fine proof quality will be minted.

The obverse of the coin carries a new portrait of the Queen made by the sculptor Karin Lorentzen. The reverse of the coin is designed by Ronny Andersen, Royal Armorist, and shows a composition including elements from the Royal Coat of Arms.

As of 10 January the coins can be purchased from the Royal Danish Mint, www.royalmint.dk, Danmarks Nationalbank and some banks and coin dealers. The gold and silver coins are sold at their nominal value. The proof version of the 20 krone coin will be sold until 16 January and by the Royal Danish Mint only. The price for a proof coin is DKK 125 incl.

VAT. The ordinary circulation coins will be sold in rolls of 20 coins each at the nominal value.

16 JANUARY 2012: CONDITIONS FOR 3-YEAR LOANS

Danmarks Nationalbank's temporary 3-year lending facility will be offered on Friday, 30 March 2012 and Friday, 28 September 2012.

The rate of interest on 3-year loans will be variable, mirroring Danmarks Nationalbank's 7-day monetary-policy lending rate plus an interest premium. The interest premium will be zero until 31 July 2013. If, after this date, Danmarks Nationalbank finds that the access to funding in the money and capital markets has normalised, the premium will be increased.

Loans may be redeemed prematurely, wholly or in part, on a weekly basis, at the earliest 6 months after the loan was raised. Drawings on this facility will be unlimited and collateralised.

For further information about the 3-year credit facility, see www.nationalbanken.dk.

27 JANUARY 2012: MODERNISATION OF DANISH PAYMENTS

It will be possible to execute payments faster. The Danish infrastructure for processing retail payments will be modernised. According to the plan, settlement of selected payments will become considerably faster over the next three years.

- From the 2nd quarter of 2012, Dankort payments at weekends and on public holidays will be credited to the retailers' accounts one day earlier than they are today.
- The 4th quarter of 2012 will see an improvement of firms' access to fast execution of large-value payments via Danmarks Nationalbank's payment system, Kronos.
- At the end of 2013, a new settlement system for credit transfers will be introduced, which will enable intraday settlement of payments on banking days, e.g. via online or mobile banking, irrespective of the size of the amount.
- At the end of 2014, a new system will be introduced, allowing execution of payments below a certain limit around the clock on all days of the week, whereby the payee will receive the funds shortly after the payment was made.

Today, Danmarks Nationalbank publishes the final report of the working group on domestic payment transfers. The report describes the planned

modernisation of the Danish payments infrastructure, including the expected costs and the overall schedule.

The working group was chaired by Danmarks Nationalbank, and consisted of representatives from the Danish Consumer Council, the Danish Chamber of Commerce, the Confederation of Danish Industry, the Danish Federation of Small and Medium-Sized Enterprises, the Ministry of Finance, the Ministry of Business and Growth, the Danish Financial Supervisory Authority, the Agency for Digitisation, the Agency for the Modernisation of Public Administration, the Danish Bankers Association and Nets. In continuation of the working group's efforts, projects have been initiated under the auspices of the Danish Bankers Association, Nets and Danmarks Nationalbank with a view to establishment of the new infrastructure.

Tables

Symbols and Sources

0 Magnitude nil or less than one half of unit employed.
… Data not available or of negligible interest.

Some of the most recent statistics may be provisional. Due to rounding-off there may be small differences between the sum of the individual figures and the totals stated.

The Tables section of this publication is closed on 14 March 2012.

Danmarks Nationalbank is the source for Tables 1-15, 17-19 and 24-25, while the Nasdaq OMX Copenhagen is the source for series of bond yields and the share-price index in Table 1. Statistics Denmark is the source for Tables 16 and 20-23. The calculations in Tables 21 and 25 have been made by Danmarks Nationalbank on the basis of data from Statistics Denmark and OECD.

INTEREST RATES AND SHARE-PRICE INDEX — Table 1

Effective end-of-year/ from	Danmarks Nationalbank's interest rates: Lending	Certificates of deposit	Current-account deposits	Discount rate	The ECB's interest rate: Main refinancing operations, fixed rate[1]	End of period	Interbank interest rate, 3-months uncollateralized	Bond yields: 10-year central-government bond	Bond yields: 30-year mortgage-credit bond	Share-price index OMXC20 (prev.KFX)
	Per cent per annum						Per cent per annum			3.7.89 =100
2007	4.25	4.25	4.00	4.00	4.00	2007	4.65	4.48	5.61	464.14
2008	3.75	3.75	3.50	3.50	2.50	2008	4.20	3.31	6.21	247.72
2009	1.20	0.95	0.85	1.00	1.00	2009	0.85	3.62	5.19	336.69
2010	1.05	0.70	0.60	0.75	1.00	2010	0.87	2.98	4.53	457.58
2011	0.70	0.30	0.25	0.75	1.00	2011	0.62	1.58	3.94	389.95
2010 27 May	1.05	0.50	0.40	0.75	1.00	Feb 11	0.82	3.17	4.71	473.64
15 Oct	1.05	0.60	0.50	0.75	1.00	Mar 11	0.92	3.39	5.23	467.15
29 Oct	1.05	0.70	0.60	0.75	1.00	Apr 11	1.02	3.27	5.19	462.81
						May 11	1.04	3.03	5.11	456.25
2011 8 Apr	1.30	0.95	0.85	1.00	1.25	Jun 11	1.15	2.98	5.16	431.06
8 Jul	1.55	1.20	1.10	1.25	1.50	Jul 11	1.22	2.80	5.04	420.54
26 Aug	1.55	1.10	1.00	1.25	1.50	Aug 11	1.36	2.35	4.88	359.41
16 Sep	1.55	1.00	0.90	1.25	1.50	Sep 11	0.97	2.06	4.15	350.34
4 Nov	1.20	0.65	0.55	1.00	1.25	Oct 11	1.15	2.33	4.26	362.77
9 Dec	0.80	0.40	0.30	0.75	1.00	Nov 11	1.10	2.04	4.21	385.19
16 Dec	0.70	0.30	0.25	0.75	1.00	Dec 11	0.62	1.58	3.94	389.95
						Jan 12	0.60	1.75	4.01	408.53
2012 14 Mar	0.70	0.30	0.25	0.75	1.00	Feb 12	0.75	1.78	3.98	453.77

[1] Until 7 October 2008 minimum bid rate.

SELECTED ITEMS FROM DANMARKS NATIONALBANK'S BALANCE SHEET — Table 2

End of period	The foreign-exchange reserve (net)	Notes and coin in circulation	The central government's account with Danmarks Nationalbank	The banks' and the mortgage banks' net position with Danmarks Nationalbank			
				Certificates of deposit	Deposits (current account)	Loans	Total net position
	Kr. billion						
2007	168.8	61.6	89.9	200.5	9.4	216.8	-6.9
2008	211.7	61.3	262.8	118.5	9.7	240.9	-112.7
2009	394.5	60.8	212.4	166.2	22.1	104.2	84.1
2010	428.7	62.5	179.4	132.5	14.5	9.3	137.8
2011	491.9	62.4	225.8	150.0	23.2	24.0	149.1
Feb 11	446.4	60.7	235.2	66.8	23.9	0.4	90.4
Mar 11	453.9	59.9	242.2	95.0	12.2	7.9	99.4
Apr 11	454.1	61.9	244.9	85.5	12.0	0.9	96.6
May 11	453.4	62.0	245.4	79.4	17.2	0.3	96.4
Jun 11	456.8	62.4	252.2	93.7	13.4	13.9	93.3
Jul 11	456.9	61.8	229.5	101.8	15.3	0.6	116.5
Aug 11	475.7	60.5	265.9	82.9	17.2	0.8	99.3
Sep 11	490.3	60.5	287.0	80.8	12.1	3.9	89.0
Oct 11	489.9	60.5	294.5	66.1	17.0	3.6	79.4
Nov 11	467.7	61.0	256.4	89.3	14.3	0.2	103.4
Dec 11	481.7	62.4	223.5	150.0	23.2	24.0	149.1
Jan 12	492.6	60.2	219.7	137.7	19.5	0.4	156.8
Feb 12	498.7	60.1	274.4	100.6	10.4	0.4	110.7

FACTORS AFFECTING THE BANKS' AND THE MORTGAGE BANKS' NET POSITION WITH DANMARKS NATIONALBANK

Table 3

	Central-government finance			Net purchase of foreign exchange by Danmarks Nationalbank					The banks' and the mortgage banks' net position with Danmarks Nationalbank	
	Domestic gross financing requirement	Sales of domestic central-government securities, etc.	Liquidity effect	Interventions to purchase foreign exchange, net	Other	Total	Net purchase of bonds by Danmarks Nationalbank	Other factors	Change in net position	End of period
	Kr. billion									
2007	-26.1	2.9	-29.1	-1.7	7.2	5.5	-0.4	-1.4	-25.3	-6.9
2008	-11.9	99.6	-111.5	-19.9	0.1	-19.8	0.6	24.9	-105.8	-112.7
2009	178.6	123.8	54.8	153.6	17.1	170.7	6.5	-35.3	196.8	84.1
2010	169.6	160.7	8.8	45.7	4.3	50.0	-0.4	-4.7	53.7	137.8
2011	93.9	143.8	-49.9	53.3	2.5	55.8	0.9	2.7	11.4	149.1
Feb 11	-27.5	9.5	-37.0	0.0	2.2	2.2	0.6	-8.5	-42.6	90.4
Mar 11	1.5	-0.2	1.7	-0.4	-0.7	-1.1	1.0	7.4	9.0	99.4
Apr 11	12.0	15.1	-3.1	0.0	0.7	0.7	0.2	-0.5	-2.7	96.6
May 11	9.1	9.5	-0.3	0.0	-0.7	-0.7	0.5	0.3	-0.3	96.4
Jun 11	10.1	14.2	-4.0	0.0	0.6	0.6	0.9	-0.5	-3.0	93.3
Jul 11	38.2	15.8	22.4	0.0	0.5	0.5	-0.1	0.3	23.2	116.5
Aug 11	-14.8	14.4	-29.2	11.2	0.5	11.7	-1.3	1.7	-17.2	99.3
Sep 11	0.5	21.4	-20.8	14.0	0.5	14.5	0.8	-4.8	-10.3	89.0
Oct 11	19.2	26.5	-7.4	0.0	-0.4	-0.4	0.1	-1.8	-9.6	79.4
Nov 11	13.0	6.9	6.1	10.7	-0.8	9.9	-0.3	8.3	24.0	103.4
Dec 11	24.0	-4.2	28.2	17.8	-0.9	16.9	-0.1	-1.1	45.7	149.1
Jan 12	14.3	10.8	3.6	0.0	1.2	1.2	-0.1	3.1	7.6	156.8
Feb 12	-32.6	19.3	-51.9	0.0	3.3	3.3	0.2	2.3	-46.1	110.7

SELECTED ITEMS FROM THE CONSOLIDATED BALANCE SHEET OF THE MFI SECTOR

Table 4

End of period	Total balance	Assets				Liabilities		Foreign assets, net [1]
		Domestic lending		Domestic securities		Domestic deposits	Bonds, etc. issued	
		Public sector	Private sector	Bonds, etc.	Shares, etc.			
	Kr. billion							
2007	5,446.3	117.5	3,356.1	43.3	63.5	1,224.8	1,505.2	-304.5
2008	6,286.4	129.1	3,724.3	40.6	56.7	1,487.5	1,508.4	-407.9
2009	5,968.5	135.9	3,647.9	78.2	65.5	1,442.8	1,650.9	-417.6
2010	6,159.1	146.6	3,696.6	41.8	87.9	1,410.1	1,660.4	-397.7
2011	6,310.3	148.8	3,640.2	45.1	82.4	1,430.5	1,740.0	-330.9
Jan 11	6,096.8	144.2	3,664.0	42.8	90.0	1,400.0	1,696.5	-335.1
Feb 11	6,112.6	142.9	3,648.1	45.9	95.1	1,451.9	1,674.9	-300.5
Mar 11	6,087.3	146.0	3,671.9	46.2	93.6	1,448.4	1,678.0	-303.1
Apr 11	6,062.1	145.5	3,660.0	49.5	92.1	1,463.0	1,683.1	-264.7
May 11	6,063.8	143.6	3,638.1	58.6	88.2	1,465.2	1,712.0	-250.5
Jun 11	5,985.7	147.4	3,649.3	60.0	87.4	1,458.7	1,714.3	-254.7
Jul 11	6,062.7	148.5	3,631.9	57.8	87.1	1,462.8	1,729.9	-260.0
Aug 11	6,190.1	142.6	3,630.0	67.2	83.6	1,486.9	1,735.5	-247.3
Sep 11	6,360.4	143.3	3,657.2	69.2	79.9	1,511.6	1,736.0	-261.3
Oct 11	6,255.6	144.6	3,647.3	72.8	81.4	1,509.5	1,726.8	-246.0
Nov 11	6,225.2	145.1	3,630.6	51.5	82.7	1,460.1	1,757.0	-245.8
Dec 11	6,310.3	148.8	3,640.2	45.1	82.4	1,430.5	1,740.0	-330.9
Jan 12	6,353.8	148.4	3,672.5	41.9	85.8	1,447.6	1,798.2	-281.8
	Change compared with previous year, per cent							
2007	...	0.6	13.5	-16.4	5.2	13.5	5.0	...
2008	...	9.8	11.0	-6.2	-10.7	21.4	0.2	...
2009	...	5.3	-2.1	92.4	15.5	-3.0	9.4	...
2010	...	7.9	1.3	-46.6	34.3	-2.3	0.6	...
2011	...	1.5	-1.5	7.9	-6.3	1.4	4.8	...
Jan 11	...	7.8	0.1	-46.5	32.4	-3.1	0.7	...
Feb 11	...	8.0	-0.1	-36.5	38.6	1.4	-0.9	...
Mar 11	...	7.9	0.4	-40.1	35.3	1.3	-0.1	...
Apr 11	...	6.7	0.3	-34.0	32.6	2.4	0.6	...
May 11	...	5.0	-1.1	-11.6	12.0	2.2	0.2	...
Jun 11	...	4.7	-1.8	11.0	9.9	1.5	0.3	...
Jul 11	...	3.4	-1.6	24.4	7.7	1.2	1.0	...
Aug 11	...	2.7	-2.3	4.3	2.9	0.8	-1.1	...
Sep 11	...	0.1	-1.5	6.7	-3.5	5.6	-0.5	...
Oct 11	...	2.2	-1.5	33.1	-5.2	4.4	-1.6	...
Nov 11	...	1.9	-1.9	75.7	-4.1	3.2	4.8	...
Dec 11	...	1.5	-1.5	7.9	-6.3	1.4	4.8	...
Jan 12	...	2.9	0.2	-2.2	-4.6	3.4	6.0	...

Note: The MFI sector includes Danish monetary financial institutions, i.e. banks and mortgage banks, other credit institutions, money-market funds and Danmarks Nationalbank.

[1] The net foreign assets of the MFI sector has been compiled as the difference between all assets and liabilities vis-a-vis non-residents.

MONEY STOCK — Table 5

End of period	Bank-notes and coin in circula-tion[1]	Deposits on demand	M1	Time deposits with original maturity =<2 years	Deposits at notice with original maturity =< 3 months	M2	Repur-chase agree-ments	Bonds, etc. issued with original maturity =< 2 years	M3
	Kr. billion								
2007	51.9	703.2	755.1	204.8	18.0	977.9	6.2	61.5	1,045.7
2008	50.4	702.8	753.2	286.4	18.4	1,058.0	4.0	57.0	1,119.1
2009	48.5	744.6	793.1	203.0	19.6	1,015.7	10.9	143.0	1,169.7
2010	52.6	747.8	800.4	143.9	18.0	962.3	58.2	241.0	1,261.8
2011	52.5	722.7	775.2	135.6	17.3	928.2	59.3	194.8	1,182.5
Jan 11	50.7	743.8	794.5	140.2	18.0	952.7	49.9	126.9	1,129.8
Feb 11	51.8	743.5	795.2	141.6	17.9	954.8	49.7	125.9	1,130.5
Mar 11	50.8	729.3	780.1	143.5	16.9	940.5	52.8	154.4	1,148.0
Apr 11	52.7	753.4	806.1	138.1	17.1	961.3	43.7	102.6	1,107.9
May 11	52.3	756.0	808.3	141.7	17.2	967.2	41.4	112.7	1,121.5
Jun 11	52.4	735.0	787.4	141.5	16.9	945.8	50.7	119.1	1,115.8
Jul 11	52.0	749.7	801.7	146.7	16.9	965.3	57.1	135.3	1,158.0
Aug 11	51.4	735.2	786.6	140.4	17.0	943.9	66.8	131.4	1,142.3
Sep 11	51.4	730.8	782.3	140.4	17.9	940.6	73.0	168.1	1,181.9
Oct 11	51.8	732.7	784.5	139.7	17.2	941.4	59.6	141.5	1,142.7
Nov 11	52.1	726.1	778.2	140.3	17.2	935.6	53.1	178.9	1,167.9
Dec 11	52.5	722.7	775.2	135.6	17.3	928.2	59.3	194.8	1,182.5
Jan 12	51.4	725.8	777.2	146.9	19.4	943.5	63.2	279.0	1,285.9
	Change compared with previous year, per cent								
2007	...	...	8.0	...	...	13.3	...	...	17.2
2008	...	...	-0.3	...	...	8.2	...	...	7.0
2009	...	...	5.3	...	...	-4.0	...	...	4.5
2010	...	...	0.9	...	...	-5.3	...	...	7.9
2011	...	...	-3.2	...	...	-3.5	...	...	-6.3
Jan 11	...	...	-2.3	...	...	-7.9	...	...	-6.9
Feb 11	...	...	-2.6	...	...	-6.6	...	...	-5.1
Mar 11	...	...	-3.8	...	...	-6.0	...	...	-5.0
Apr 11	...	...	-2.8	...	...	-5.3	...	...	-8.4
May 11	...	...	-3.7	...	...	-5.8	...	...	-9.0
Jun 11	...	...	-4.7	...	...	-5.1	...	...	-8.7
Jul 11	...	...	-4.9	...	...	-5.4	...	...	-10.9
Aug 11	...	...	-6.2	...	...	-6.9	...	...	-12.7
Sep 11	...	...	-4.2	...	...	-2.7	...	...	-5.2
Oct 11	...	...	-4.8	...	...	-6.1	...	...	-9.9
Nov 11	...	...	-4.7	...	...	-4.9	...	...	-6.8
Dec 11	...	...	-3.2	...	...	-3.5	...	...	-6.3
Jan 12	...	...	-2.2	...	...	-1.0	...	...	13.8

[1] Notes and coin in circulation, excluding the banks' holdings.

SELECTED ITEMS FROM THE BALANCE SHEET OF THE BANKS — Table 6

End of period	Total balance	Assets					Liabilities	
		Lending to MFIs	Domestic lending			Holdings of securities	Loans from MFIs	Deposits
			Total	of which:				
				Households, etc.	Non-financial companies			
	Kr. billion							
2007	3,940.0	924.3	1,333.6	557.4	551.8	1,065.8	1,433.5	1,353.9
2008	4,568.5	974.6	1,546.3	586.8	603.3	1,092.1	1,444.2	1,424.2
2009	4,147.6	876.1	1,359.1	575.7	529.7	1,203.5	1,168.8	1,427.4
2010	4,197.4	902.7	1,334.6	570.2	494.7	1,157.1	1,118.3	1,489.7
2011	4,234.7	841.3	1,230.0	562.0	430.4	1,151.6	1,052.5	1,483.6
Jan 11	4,079.9	833.4	1,300.3	560.8	488.9	1,160.6	1,050.1	1,476.2
Feb 11	4,023.8	831.9	1,280.1	558.7	485.2	1,134.6	1,002.5	1,465.0
Mar 11	3,976.6	796.4	1,300.1	565.1	482.6	1,133.1	996.4	1,442.9
Apr 11	3,930.7	728.2	1,286.8	559.9	478.5	1,127.2	903.1	1,443.6
May 11	3,909.1	740.1	1,258.5	556.0	462.0	1,112.7	831.5	1,496.1
Jun 11	3,870.4	731.0	1,273.4	564.4	463.4	1,131.6	949.6	1,461.1
Jul 11	3,923.9	723.1	1,253.8	560.4	449.4	1,146.8	937.7	1,493.2
Aug 11	4,011.0	733.3	1,238.1	559.8	446.4	1,139.0	953.4	1,476.8
Sep 11	4,159.8	758.7	1,264.2	566.9	453.0	1,120.1	989.2	1,486.5
Oct 11	4,045.9	734.2	1,252.7	561.9	446.2	1,122.1	978.8	1,453.2
Nov 11	4,022.8	747.5	1,229.4	556.6	445.6	1,119.1	977.6	1,462.2
Dec 11	4,234.7	841.3	1,230.0	562.0	430.4	1,151.6	1,052.5	1,483.6
Jan 12	4,237.2	762.8	1,258.4	553.8	427.1	1,169.3	1,052.7	1,490.3
		Change compared with previous year, per cent						
2007	...	29.3	18.6	17.4	20.5	19.8	27.1	17.3
2008	...	5.4	15.9	5.3	9.3	2.5	0.7	5.2
2009	...	-10.1	-12.1	-1.9	-12.2	10.2	-19.1	0.2
2010	...	3.0	-1.8	-1.0	-6.6	-3.9	-4.3	4.4
2011	...	-6.8	-7.8	-1.4	-13.0	-0.5	-5.9	-0.4
Jan 11	...	-12.3	-4.5	-0.8	-6.6	-3.3	-15.4	2.3
Feb 11	...	-14.2	-4.8	-0.4	-9.3	-3.9	-19.5	2.5
Mar 11	...	-16.1	-3.5	-0.2	-9.4	-8.7	-20.4	0.9
Apr 11	...	-20.5	-3.5	0.0	-9.4	-5.3	-20.8	-0.4
May 11	...	-22.8	-7.0	-0.5	-12.3	-8.5	-29.1	2.2
Jun 11	...	-20.4	-8.3	-0.9	-12.9	-11.3	-20.8	2.4
Jul 11	...	-22.7	-7.9	-0.5	-12.0	-7.8	-18.4	0.0
Aug 11	...	-24.0	-9.7	-0.6	-13.9	-6.8	-17.9	-4.4
Sep 11	...	-16.6	-7.3	-0.7	-10.3	-8.5	-23.7	1.5
Oct 11	...	-20.3	-7.1	-0.3	-10.1	-2.8	-16.6	-4.0
Nov 11	...	-23.5	-8.2	-0.7	-10.6	-5.1	-20.9	-3.1
Dec 11	...	-6.8	-7.8	-1.4	-13.0	-0.5	-5.9	-0.4
Jan 12	...	-8.5	-3.2	-1.3	-12.6	0.8	0.2	1.0

Note: Excluding Danish banks' units abroad.

SELECTED ITEMS FROM THE BALANCE SHEET OF THE MORTGAGE BANKS

Table 7

End of period	Total balance	Assets					Liabilities	
		Lending to MFIs	Domestic lending			Holdings of securities	Loans from MFIs	Bonds, etc. issued
			Total	of which:				
				Households, etc.	Non-financial companies			
	Kr. billion							
2007	3,088.2	362.8	2,015.5	1,549.2	404.0	649.2	344.2	2,495.2
2008	3,322.7	428.5	2,164.6	1,629.6	466.7	633.5	474.4	2,582.3
2009	3,827.1	512.2	2,278.8	1,712.2	501.0	927.6	539.3	3,048.3
2010	4,009.6	572.6	2,347.1	1,749.2	532.0	976.9	632.1	3,139.3
2011	3,996.4	602.9	2,396.2	1,775.5	558.1	869.9	660.9	3,135.3
Jan 11	3,207.3	454.3	2,346.3	1,747.2	533.2	307.5	529.4	2,480.7
Feb 11	3,226.3	455.3	2,349.7	1,749.0	534.8	312.5	525.5	2,487.0
Mar 11	3,432.6	509.9	2,354.7	1,748.4	539.1	465.1	562.9	2,635.3
Apr 11	3,202.2	451.5	2,356.3	1,751.7	539.0	297.5	506.8	2,482.4
May 11	3,227.5	453.5	2,363.0	1,754.5	542.7	305.7	515.0	2,503.8
Jun 11	3,266.8	508.2	2,365.1	1,754.5	544.3	295.6	528.5	2,509.4
Jul 11	3,256.6	481.8	2,368.2	1,756.3	545.4	300.7	530.9	2,516.0
Aug 11	3,310.8	493.3	2,375.9	1,762.0	548.0	325.5	546.5	2,560.9
Sep 11	3,494.0	574.1	2,375.7	1,760.1	549.0	433.9	597.5	2,693.1
Oct 11	3,339.0	510.7	2,379.3	1,763.7	551.8	336.8	553.7	2,588.5
Nov 11	3,439.7	517.8	2,385.3	1,768.0	554.2	417.8	554.7	2,690.6
Dec 11	3,996.4	602.9	2,396.2	1,775.5	558.1	869.9	660.9	3,135.3
Jan 12	3,377.5	543.8	2,398.1	1,777.8	558.4	321.6	569.3	2,635.9
	Change compared with previous year, per cent							
2007	...	48.0	9.9	9.1	12.8	13.1	52.0	8.6
2008	...	18.1	7.4	5.2	15.5	-2.4	37.8	3.5
2009	...	19.5	5.3	5.1	7.4	46.4	13.7	18.0
2010	...	11.8	3.0	2.2	6.2	5.3	17.2	3.0
2011	...	5.3	2.1	1.5	4.9	-11.0	4.6	-0.1
Jan 11	...	5.9	2.8	1.9	5.7	10.5	9.3	2.6
Feb 11	...	3.9	2.7	1.9	5.3	7.5	6.0	1.7
Mar 11	...	1.9	2.8	1.9	6.3	23.5	4.4	3.8
Apr 11	...	6.3	2.6	2.0	4.8	-0.1	2.9	1.2
May 11	...	-1.4	2.6	1.9	4.9	1.9	0.4	0.5
Jun 11	...	-2.9	2.3	1.6	5.0	-9.2	-3.0	-1.2
Jul 11	...	0.8	2.2	1.4	5.0	-7.7	0.1	0.0
Aug 11	...	-1.9	2.1	1.3	5.4	-4.8	-0.6	-0.1
Sep 11	...	-1.6	1.8	1.1	4.6	5.8	2.9	1.6
Oct 11	...	2.4	1.8	1.1	5.0	-3.1	3.2	0.9
Nov 11	...	-1.3	1.7	1.1	4.8	-1.6	-2.5	2.2
Dec 11	...	5.3	2.1	1.5	4.9	-11.0	4.6	-0.1
Jan 12	...	19.7	2.2	1.8	4.7	4.6	7.5	6.3

LENDING TO RESIDENTS BY THE BANKS AND THE MORTGAGE BANKS

Table 8

End of period	Total lending			The banks' lending			The mortgage banks' lending		
	Total	House-holds, etc.	Business, etc.	Total	House-holds, etc.	Business, etc.	Total	House-holds, etc.	Business, etc.
	Kr. billion								
2007	3,387.8	2,106.7	1,173.0	1,372.3	557.4	760.5	2,015.5	1,549.2	412.4
2008	3,787.5	2,216.4	1,456.4	1,622.9	586.8	978.3	2,164.6	1,629.6	478.1
2009	3,682.4	2,287.9	1,283.8	1,403.6	575.7	770.0	2,278.8	1,712.2	513.8
2010	3,704.3	2,319.4	1,281.8	1,357.2	570.2	738.6	2,347.1	1,749.2	543.1
2011	3,644.8	2,337.6	1,216.5	1,248.6	562.0	646.3	2,396.2	1,775.5	570.1
Jan 11	3,666.2	2,308.0	1,259.1	1,319.9	560.8	714.8	2,346.3	1,747.2	544.3
Feb 11	3,649.4	2,307.7	1,245.9	1,299.7	558.7	699.9	2,349.7	1,749.0	546.0
Mar 11	3,674.4	2,313.5	1,263.0	1,319.7	565.1	712.4	2,354.7	1,748.4	550.5
Apr 11	3,660.7	2,311.6	1,254.7	1,304.4	559.9	704.3	2,356.3	1,751.7	550.3
May 11	3,639.2	2,310.6	1,234.8	1,276.1	556.0	680.6	2,363.0	1,754.5	554.3
Jun 11	3,656.1	2,318.9	1,237.2	1,291.0	564.4	681.2	2,365.1	1,754.5	556.0
Jul 11	3,640.8	2,316.7	1,224.1	1,272.7	560.4	666.9	2,368.2	1,756.3	557.2
Aug 11	3,632.9	2,321.8	1,220.0	1,257.0	559.8	660.0	2,375.9	1,762.0	560.0
Sep 11	3,658.7	2,327.0	1,239.8	1,283.0	566.9	678.8	2,375.7	1,760.1	560.9
Oct 11	3,650.5	2,325.6	1,234.3	1,271.3	561.9	670.5	2,379.3	1,763.7	563.8
Nov 11	3,633.3	2,324.6	1,218.6	1,248.0	556.6	652.4	2,385.3	1,768.0	566.2
Dec 11	3,644.8	2,337.6	1,216.5	1,248.6	562.0	646.3	2,396.2	1,775.5	570.1
Jan 12	3,675.1	2,331.5	1,254.3	1,277.0	553.8	683.9	2,398.1	1,777.8	570.4
	Change compared with previous year, per cent								
2007	12.9	11.2	17.0	17.7	17.4	19.4	9.9	9.1	12.8
2008	11.8	5.2	24.2	18.3	5.3	28.6	7.4	5.2	15.9
2009	-2.8	3.2	-11.9	-13.5	-1.9	-21.3	5.3	5.1	7.5
2010	0.6	1.4	-0.2	-3.3	-1.0	-4.1	3.0	2.2	5.7
2011	-1.6	0.8	-5.1	-8.0	-1.4	-12.5	2.1	1.5	5.0
Jan 11	-0.5	1.3	-2.9	-5.8	-0.8	-8.4	2.8	1.9	5.3
Feb 11	-0.7	1.3	-3.6	-6.1	-0.4	-9.4	2.7	1.9	5.0
Mar 11	-0.1	1.3	-2.1	-4.9	-0.2	-7.4	2.8	1.9	5.9
Apr 11	0.0	1.5	-1.8	-4.3	0.0	-6.3	2.6	2.0	4.6
May 11	-1.3	1.3	-5.0	-7.7	-0.5	-11.7	2.6	1.9	4.8
Jun 11	-2.0	1.0	-6.6	-8.9	-0.9	-14.3	2.3	1.6	5.0
Jul 11	-1.6	0.9	-5.3	-7.8	-0.5	-12.5	2.2	1.4	4.9
Aug 11	-2.2	0.8	-6.7	-9.6	-0.6	-15.0	2.1	1.3	5.4
Sep 11	-1.5	0.7	-4.3	-7.2	-0.7	-10.6	1.8	1.1	4.7
Oct 11	-1.6	0.8	-4.7	-7.3	-0.3	-11.7	1.8	1.1	5.1
Nov 11	-2.0	0.6	-5.8	-8.3	-0.7	-13.4	1.7	1.1	4.9
Dec 11	-1.6	0.8	-5.1	-8.0	-1.4	-12.5	2.1	1.5	5.0
Jan 12	0.2	1.0	-0.4	-3.3	-1.3	-4.3	2.2	1.8	4.8

Note: Including lending in Danish banks' units abroad. The category "Business etc." includes non-financial companies, pension and insurance companies, other financial intermediaries (except banks and mortgage banks) and unknown sector.

THE MORTGAGE BANKS' LENDING BROKEN DOWN BY TYPE Table 9

End of period	Index-linked lending	Fixed-rate lending	Adjustable-rate lending		Total	of which:	
			Total	of which =<1 year		Lending in foreign currency	Instalment-free lending [1]
	Kr. billion						
2007	77.9	889.2	1,045.6	796.6	2,012.7	123.8	547.3
2008	72.4	903.9	1,189.1	900.3	2,165.4	155.3	626.4
2009	68.3	740.2	1,472.7	1,106.6	2,281.2	211.4	695.1
2010	63.9	644.1	1,641.0	1,190.5	2,349.0	232.3	740.6
2011	59.8	606.4	1,728.1	1,229.5	2,394.4	219.0	780.2
Jan 11	64.0	640.1	1,643.6	1,183.3	2,347.7	231.2	741.6
Feb 11	64.1	643.9	1,647.8	1,184.8	2,355.8	231.5	744.8
Mar 11	64.3	635.8	1,657.6	1,188.3	2,357.7	231.6	749.1
Apr 11	64.4	633.4	1,660.4	1,197.0	2,358.1	230.8	751.2
May 11	64.1	634.9	1,666.1	1,200.2	2,365.1	230.7	754.0
Jun 11	62.2	634.0	1,670.4	1,202.8	2,366.7	231.3	757.1
Jul 11	62.2	632.3	1,675.5	1,205.1	2,370.0	230.4	759.3
Aug 11	62.2	636.1	1,679.5	1,206.3	2,377.8	230.4	762.9
Sep 11	62.2	631.1	1,684.1	1,215.4	2,377.4	230.0	765.8
Oct 11	62.3	627.1	1,691.7	1,207.6	2,381.1	227.8	769.5
Nov 11	61.9	623.6	1,701.6	1,210.9	2,387.1	226.3	774.6
Dec 11	59.8	606.4	1,728.1	1,229.5	2,394.4	219.0	780.2
Jan 12	60.1	607.8	1,731.5	1,232.1	2,399.5	212.6	781.6

Note: The Table includes the mortgage-credit lending to residents only, whereas Tables 7 and 8 include the institutes' total lending to residents.

[1] The mortgage banks' instalment-free lending to owner-occupied dwellings.

THE BANKS' EFFECTIVE INTEREST RATES — Table 10

	Lending				Deposits			
	All sectors	Households, etc.	Non-financial companies	Financial companies	All sectors	Households, etc.	Non-financial companies	Financial companies
	Per cent, per annum							
Q1 07	5.7	7.1	5.5	3.6	3.1	2.8	3.2	3.4
Q2 07	5.9	7.2	5.7	4.0	3.4	3.1	3.4	3.8
Q3 07	6.1	7.4	6.0	4.1	3.6	3.3	3.6	4.0
Q4 07	6.2	7.4	6.1	4.3	3.7	3.4	3.7	4.1
Q1 08	6.2	7.5	6.1	4.5	3.7	3.5	3.8	4.2
Q2 08	6.5	7.7	6.3	4.6	3.8	3.6	3.9	4.2
Q3 08	6.6	7.8	6.5	4.9	4.0	3.6	4.1	4.5
Q4 08	7.0	8.4	7.1	5.2	4.4	3.9	4.5	5.0
Q1 09	6.0	7.4	6.3	4.0	3.3	2.8	3.2	4.1
Q2 09	5.1	6.4	5.4	2.7	2.2	2.0	2.0	2.6
Q3 09	4.5	6.0	5.0	2.1	1.7	1.7	1.5	1.9
Q4 09	4.1	5.6	4.6	1.7	1.4	1.5	1.1	1.5
Q1 10	3.9	5.5	4.4	1.5	1.2	1.4	0.9	1.3
Q2 10	3.6	5.3	4.2	1.3	1.0	1.2	0.7	1.0
Q3 10	3.5	5.1	4.1	1.2	0.9	1.1	0.6	0.8
Q4 10	3.6	5.1	4.2	1.2	0.9	1.1	0.6	0.9
Q1 11	3.8	5.2	4.2	1.3	1.0	1.1	0.7	0.9
Q2 11	4.0	5.3	4.3	1.6	1.1	1.2	0.8	1.1
Q3 11	4.2	5.6	4.6	1.7	1.2	1.3	0.9	1.3
Q4 11	4.2	5.8	4.7	1.5	1.1	1.3	0.8	1.0
Jan 11	3.8	5.2	4.2	1.3	0.9	1.1	0.6	0.9
Feb 11	3.8	5.2	4.3	1.4	1.0	1.1	0.7	1.0
Mar 11	3.9	5.1	4.2	1.4	1.0	1.1	0.7	0.9
Apr 11	4.0	5.2	4.4	1.5	1.0	1.1	0.8	1.1
May 11	4.1	5.3	4.4	1.6	1.1	1.2	0.8	1.2
Jun 11	4.0	5.3	4.4	1.6	1.1	1.2	0.9	1.1
Jul 11	4.1	5.5	4.5	1.7	1.2	1.3	0.9	1.3
Aug 11	4.3	5.6	4.7	1.8	1.2	1.3	1.0	1.3
Sep 11	4.2	5.7	4.6	1.6	1.2	1.3	0.9	1.3
Oct 11	4.2	5.7	4.7	1.6	1.2	1.3	0.9	1.2
Nov 11	4.3	5.8	4.8	1.5	1.1	1.3	0.8	1.0
Dec 11	4.1	5.7	4.6	1.3	1.0	1.2	0.7	0.9
Jan 12	3.9	5.8	4.6	1.1	0.9	1.2	0.6	0.7

DANMARKS NATIONALBANK'S LENDING SURVEY Table 11

	Changes in banks and mortgage banks' credit policies			
	Corporate lending		Lending to households	
	Development in current quarter	Expectations for the coming quarter	Development in current quarter	Expectations for the coming quarter
	Net balance			
Q1 09	-59.8	-27.6	-23.1	-5.2
Q2 09	-10.4	-6.7	-1.0	-5.0
Q3 09	-3.7	-0.9	-0.1	-4.7
Q4 09	2.4	-4.1	-4.5	0.0
Q1 10	-7.3	-0.2	-4.5	-4.8
Q2 10	0.6	0.9	0.0	4.7
Q3 10	1.1	-0.1	-0.3	4.6
Q4 10	8.4	10.1	0.0	0.1
Q1 11	-2.7	3.0	4.4	-5.7
Q2 11	-8.5	0.9	0.0	-4.4
Q3 11	-20.7	-1.9	-23.3	0.3
Q4 11	-4.2	-10.3	-6.0	-22.3

Note: A negative net balance indicates that, overall, the institutions have tightened their credit policies, thus making it more difficult to obtain loans, while a positive net balance indicates an overall easing of credit policies. The net balance indicates the institutions' assessment of quarter-on-quarter changes and not absolute changes. For a detailed presentation of the lending survey, see Carina Moselund Jensen and Tania Al-Zagheer Sass, Danmarks Nationalbank's Lending Survey – New Statistics for Changes in Banks' and Mortgage-Credit Institutes' Credit Policies, Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2009.

SELECTED ITEMS FROM THE BALANCE SHEET OF INVESTMENT FUNDS Table 12

End of period	Total balance	Assets		Liabilities			
		Holdings of securities		Investment fund shares/units broken down by sector			
		Bonds, etc.	Shares, etc.	House-holds	Insurance compa-nies and pension funds	Other	Abroad
	Kr. billion.						
2007	1,020.7	477.9	411.6	295.2	336.8	322.1	29.2
2008	773.2	425.3	222.5	211.4	266.9	238.1	14.6
2009	865.5	487.5	301.4	252.7	357.8	185.1	22.7
2010	1,287.6	768.8	385.9	299.1	653.1	235.5	25.2
2011	1,426.9	877.9	356.1	300.0	682.5	316.4	25.6
Jan 11	1,299.6	778.6	390.9	299.7	653.0	237.9	26.4
Feb 11	1,315.5	791.9	397.9	301.2	658.4	243.3	26.7
Mar 11	1,290.6	776.6	387.1	299.1	657.6	241.1	26.4
Apr 11	1,295.4	775.2	386.7	298.4	662.6	240.4	25.9
May 11	1,363.0	798.7	391.0	303.1	668.0	295.1	26.2
Jun 11	1,348.3	784.4	380.9	301.0	655.2	295.1	26.3
Jul 11	1,365.5	809.4	375.7	303.2	660.3	300.4	26.5
Aug 11	1,340.2	822.3	333.5	292.4	646.8	295.8	23.8
Sep 11	1,335.6	830.8	326.0	286.0	643.2	291.7	23.3
Oct 11	1,383.4	836.8	364.3	292.9	660.5	300.5	24.7
Nov 11	1,400.8	849.4	375.8	293.7	661.1	318.3	24.8
Dec 11	1,426.9	877.9	356.1	300.0	682.5	316.4	25.6
Jan 12	1,487.9	895.7	395.4	309.4	704.3	329.9	26.7

SECURITIES ISSUED BY RESIDENTS BY OWNER'S HOME COUNTRY — Table 13

End of period	Bonds, etc.						Shares	
	Total		of which:					
			Central-government securities		Mortgage-credit bonds			
	Denmark	Abroad	Denmark	Abroad	Denmark	Abroad	Denmark	Abroad
	Market value, kr. billion							
2007	2,701.2	475.8	301.9	176.2	2,247.1	287.7	996.1	445.4
2008	2,981.3	405.0	363.1	158.5	2,419.4	227.4	529.9	244.4
2009	3,414.8	431.8	394.1	159.8	2,802.7	252.0	641.0	347.5
2010	3,540.3	549.9	473.9	173.1	2,834.9	352.5	784.5	545.5
2011	3,547.9	638.9	515.5	261.4	2,835.6	361.7	646.4	471.9
Jan 11	2,776.1	595.4	462.2	190.2	2,089.0	381.1	794.8	543.6
Feb 11	2,798.6	577.7	463.7	194.3	2,114.0	360.8	794.5	560.3
Mar 11	2,948.8	562.5	450.5	195.2	2,279.9	346.5	774.2	553.6
Apr 11	2,795.1	575.1	463.3	199.4	2,117.2	352.4	783.1	554.1
May 11	2,815.7	582.0	477.6	197.6	2,125.2	364.3	767.7	538.7
Jun 11	2,815.1	602.4	475.3	201.7	2,130.5	382.6	717.6	513.0
Jul 11	2,828.4	598.8	493.0	209.9	2,132.3	371.4	699.5	503.5
Aug 11	2,876.6	627.8	500.7	232.6	2,173.9	377.1	612.0	431.2
Sep 11	3,035.9	642.6	511.3	256.9	2,324.3	366.1	593.8	425.1
Oct 11	2,925.8	643.5	513.3	264.9	2,214.2	360.0	588.2	438.7
Nov 11	3,109.9	657.8	497.5	262.3	2,416.8	378.7	640.8	454.7
Dec 11	3,547.9	638.9	515.5	261.4	2,835.6	361.7	646.4	471.9
Jan 12	2,951.1	652.0	517.6	255.8	2,242.4	380.7	703.1	489.6

Note: Comprise quoted and unquoted securities registered with the VP Securities Services (VP).

HOUSEHOLDS' FINANCIAL ASSETS AND LIABILITIES — Table 14

	Assets					Liabilities		
End of period	Currency and bank deposits, etc.	Bonds, etc.	Shares and certificates issued by investment funds, etc.	Life-insurance and pension-scheme savings, etc.	Total	Loans, etc.	Net financial assets	Total
	Kr. billion							
2006	839	181	1,563	1,681	4,263	2,095	2,168	4,263
2007	902	188	1,453	1,722	4,264	2,273	1,991	4,264
2008	905	173	794	1,786	3,659	2,418	1,241	3,659
2009	936	165	1,032	1,924	4,057	2,541	1,515	4,056
2010	967	148	1,239	2,129	4,483	2,655	1,828	4,483
Q3 10	941	156	1,152	2,172	4,421	2,605	1,816	4,421
Q4 10	967	148	1,239	2,129	4,483	2,655	1,828	4,483
Q1 11	936	149	1,202	2,115	4,401	2,621	1,781	4,402
Q2 11	934	142	1,199	2,148	4,424	2,648	1,776	4,424
Q3 11	911	143	1,039	2,220	4,312	2,642	1,670	4,312

COMPANIES' FINANCIAL ASSETS AND LIABILITIES Table 15

End of period	Assets				Liabilities				
					Debt				
	Currency, bank deposits and granted credits, etc.	Bonds, etc.	Shares and certificates issued by investment funds, etc.	Total	Loans, etc.	Bonds, etc. issued	Shares, etc. issued	Net financial assets	Total
	Kr. billion								
2006	837	148	3,083	4,068	1,584	139	4,429	-2,085	4,068
2007	911	134	2,923	3,968	1,732	118	4,284	-2,166	3,968
2008	1,048	106	1,788	2,943	1,936	108	2,518	-1,619	2,943
2009	1,047	107	2,225	3,380	1,896	136	3,062	-1,714	3,380
2010	1,106	124	2,639	3,868	1,915	143	3,708	-1,899	3,868
Q3 10	1,075	110	2,463	3,647	1,951	132	3,413	-1,849	3,648
Q4 10	1,106	124	2,639	3,868	1,915	143	3,708	-1,899	3,868
Q1 11	1,079	131	2,543	3,753	1,817	158	3,604	-1,826	3,753
Q2 11	1,049	123	2,548	3,721	1,845	150	3,525	-1,799	3,721
Q3 11	1,068	118	2,270	3,455	1,825	154	3,035	-1,559	3,455

Note: Companies are defined as non-financial companies.

CURRENT ACCOUNT OF THE BALANCE OF PAYMENTS (NET REVENUES) Table 16

	Goods (fob)	Services	Goods and services	Wages and property income	Current transfers	Total current account
	Kr. billion					
2007	2.1	40.3	42.5	9.7	-29.2	23.0
2008	4.2	52.1	56.3	23.0	-28.7	50.5
2009	41.8	24.0	65.8	17.8	-28.9	54.6
2010	48.5	48.1	96.6	32.6	-32.4	96.9
2011	51.7	46.1	97.8	50.1	-32.2	115.8
Feb 10 - Jan 11	52.5	50.4	102.9	35.1	-32.3	105.7
Feb 11 - Jan 12	49.1	45.8	94.9	49.7	-32.1	112.6
Jan 11	4.7	3.4	8.0	5.0	-4.0	9.0
Feb 11	4.3	3.3	7.6	3.7	-3.7	7.7
Mar 11	7.1	2.9	10.0	1.0	-3.2	7.8
Apr 11	4.7	4.5	9.2	2.7	-2.0	9.8
May 11	3.4	2.4	5.8	6.4	-2.0	10.1
Jun 11	4.1	3.8	7.9	5.4	-2.1	11.3
Jul 11	4.1	2.8	6.8	5.4	-2.5	9.7
Aug 11	5.0	4.8	9.8	4.8	-2.6	12.1
Sep 11	4.0	5.2	9.1	5.0	-2.7	11.5
Oct 11	3.5	4.2	7.7	3.2	-2.6	8.3
Nov 11	5.4	4.5	9.8	3.6	-2.6	10.7
Dec 11	1.6	4.4	6.0	3.9	-2.2	7.7
Jan 12	2.1	3.1	5.2	4.6	-3.9	5.9

FINANCIAL ACCOUNT OF THE BALANCE OF PAYMENTS
(NET PAYMENTS FROM ABROAD) Table 17

	Current account and capital account, etc., total [1]	Capital import				Other [3]	Danmarks Nationalbank's transactions with abroad [4]
		Direct investments		Portfolio investments [2]	Other capital import		
		Danish abroad	Foreign in Denmark				
	Kr. billion						
2007	23.3	-112.3	64.3	-32.0	56.5	-1.0	-1.2
2008	50.9	-67.6	9.3	52.7	-49.5	-67.1	-71.4
2009	54.4	-33.9	21.1	69.7	193.3	-16.6	288.0
2010	97.4	-19.5	-41.6	-16.0	93.8	-87.6	26.5
2011	120.0	-126.9	79.2	11.8	-47.2	16.1	56.1
Feb 10 - Jan 11	106.3	-21.2	-54.2	14.0	15.8	-53.2	7.7
Feb 11 - Jan 12	116.9	-125.7	83.1	-45.8	17.6	11.9	54.8
Jan 11	9.1	-10.0	-7.1	16.4	-24.8	17.5	1.2
Feb 11	7.7	-11.4	-1.4	9.1	-10.5	23.6	17.2
Mar 11	7.9	-3.9	4.5	3.4	0.3	-3.9	8.5
Apr 11	9.9	-13.9	3.2	31.3	-2.8	-25.8	2.0
May 11	10.2	-11.3	42.3	8.3	-48.6	1.4	2.5
Jun 11	11.3	-21.1	2.5	13.7	15.8	-18.5	4.1
Jul 11	13.4	-8.5	-3.4	-34.1	28.0	4.0	-0.4
Aug 11	12.1	2.3	4.2	37.3	-17.4	-19.0	19.8
Sep 11	11.5	-37.0	31.8	33.7	-41.7	14.2	12.8
Oct 11	8.4	-4.5	7.7	-19.6	28.3	-20.4	-0.3
Nov 11	10.8	-11.0	2.1	-59.9	2.5	32.2	-23.4
Dec 11	7.8	3.6	-7.3	-27.8	23.7	10.7	12.1
Jan 12	5.9	-8.8	-3.2	-41.2	40.0	13.2	0.0

[1] Including total current account and capital transfers, etc.
[2] This item may differ from the total of Table 18, as portfolio investments are published 1-2 weeks earlier than the rest of the balance of payments.
[3] Including errors and omissions.
[4] Including transactions on *all* Danmarks Nationalbank's accounts with abroad and not only transactions on accounts included by compilation of the foreign-exchange reserve. The latter is published by press release on the 2nd banking day of each month and included in Table 2 of this section.

PORTFOLIO INVESTMENTS OF THE BALANCE OF PAYMENTS
(NET PAYMENTS FROM ABROAD) Table 18

	Danish securities			Foreign securities		
	Krone-denominated bonds, etc.	Foreign currency denominated bonds, etc.	Shares	Bonds, etc.	Shares	Total [1]
	Kr. billion					
2007	26.2	73.4	15.0	-96.4	-50.1	-32.0
2008	-59.8	142.1	11.3	-91.0	50.1	52.7
2009	-4.3	162.3	38.0	-82.5	-43.8	69.7
2010	68.0	-39.5	40.1	-60.4	-24.1	-16.0
2011	65.9	-72.9	-12.4	36.7	-5.4	11.8
Jan 11	34.1	7.6	-1.3	-13.2	-10.7	16.4
Feb 11	-11.3	37.3	-2.6	-11.7	-2.6	9.1
Mar 11	5.0	0.6	-1.5	5.3	-6.1	3.4
Apr 11	2.1	14.2	8.6	10.7	-4.3	31.3
May 11	5.0	11.5	-15.4	7.9	-0.8	8.3
Jun 11	14.0	-39.3	0.5	31.5	7.0	13.7
Jul 11	-1.7	-24.6	0.4	-2.5	-5.7	-34.1
Aug 11	24.0	-10.2	-5.4	21.1	7.9	37.3
Sep 11	4.4	-11.7	0.1	36.9	4.0	33.7
Oct 11	8.4	-12.7	-1.2	-6.8	-7.2	-19.6
Nov 11	1.3	-31.0	1.8	-37.9	5.8	-59.9
Dec 11	-19.4	-14.6	3.5	-4.7	7.4	-27.8
Jan 12	5.0	2.6	0.5	-36.2	-13.2	-41.2

Note: A negative sign (-) indicates residents' net purchase of foreign securities, or non-residents' net sale of Danish securities.

[1] This item may differ from "Portfolio investments" in Table 17, as the rest of the balance of payments is published 1-2 weeks later.

DENMARK'S EXTERNAL ASSETS AND LIABILITIES — Table 19

End of period	Direct investments		Portfolio investments		Financial derivatives, net	Other investments			Danmarks Nationalbank	Total
	Equity	Inter-company debt, etc.	Shares, etc.	Bonds, etc.		Trade credits	Loans and deposits	Other		
	Kr. billion									
Assets										
2006	579	260	746	678	47	41	823	30	178	3,383
2007	650	288	794	733	0	47	1,035	32	176	3,755
2008	650	380	449	784	83	45	1,101	37	226	3,754
2009	730	376	612	926	21	38	927	32	400	4,061
2010	834	401	735	1,031	39	45	990	33	432	4,539
Q3 10	808	424	657	1,023	86	45	1,067	34	474	4,619
Q4 10	834	401	735	1,031	39	45	990	33	432	4,539
Q1 11	833	401	739	1,020	11	47	961	33	454	4,500
Q2 11	857	438	729	979	23	50	913	32	459	4,480
Q3 11	895	458	661	952	109	47	955	32	497	4,607
Liabilities										
2006	482	270	356	1,066	•	32	1,142	35	4	3,386
2007	543	277	422	1,123	•	36	1,409	38	5	3,853
2008	511	292	241	1,198	•	41	1,398	40	121	3,843
2009	497	303	348	1,362	•	34	1,402	38	5	3,988
2010	489	289	520	1,433	•	40	1,538	41	5	4,355
Q3 10	506	304	454	1,376	•	38	1,664	42	37	4,421
Q4 10	489	289	520	1,433	•	40	1,538	41	5	4,355
Q1 11	484	278	535	1,458	•	39	1,466	41	3	4,304
Q2 11	495	299	489	1,484	•	41	1,367	42	2	4,218
Q3 11	533	296	403	1,493	•	39	1,385	43	3	4,195
Net assets										
2006	98	-11	390	-387	47	10	-319	-5	174	-3
2007	108	11	372	-390	0	11	-375	-6	171	-98
2008	139	87	208	-415	83	4	-297	-3	105	-89
2009	233	73	264	-436	21	3	-475	-6	395	73
2010	344	111	215	-403	39	4	-548	-8	428	184
Q3 10	302	120	204	-353	86	8	-597	-8	437	198
Q4 10	344	111	215	-403	39	4	-548	-8	428	184
Q1 11	349	123	204	-438	11	9	-505	-9	452	196
Q2 11	363	139	240	-505	23	9	-453	-10	457	262
Q3 11	362	163	258	-541	109	8	-429	-11	494	412

Note: As a key principle, the market value has been used for the compilation.

GDP BY TYPE OF EXPENDITURE Table 20

	GDP	Final domestic demand					Exports of goods and services	Imports of goods and services
		Private consumption	General-government consumption	Gross fixed capital formation	Change in inventories	Total		
	Kr. billion							
2007	1,695.3	820.4	440.0	371.4	24.8	1,656.5	885.2	846.5
2008	1,753.2	840.0	465.4	371.7	20.4	1,697.5	959.6	904.0
2009	1,667.8	814.9	497.0	313.5	-20.1	1,605.2	793.7	731.1
2010	1,754.6	850.9	510.2	305.1	-4.0	1,662.3	883.0	790.7
2011	1,789.1	869.9	512.4	309.9	0.4	1,692.5	961.9	865.4
Q4 10	453.7	222.5	130.2	80.7	-2.8	430.6	230.3	207.2
Q1 11	434.9	212.2	126.3	69.4	1.6	409.4	234.0	208.5
Q2 11	450.9	216.9	129.5	79.5	2.5	428.4	239.0	216.4
Q3 11	444.0	212.8	126.9	78.4	0.9	418.9	244.5	219.4
Q4 11	459.2	228.1	129.8	82.5	-4.5	435.8	244.4	221.0
	Real growth compared with previous year, per cent							
2007	1.6	3.0	1.3	0.4	...	2.3	2.8	4.3
2008	-0.8	-0.3	1.9	-4.1	...	-0.9	3.3	3.3
2009	-5.8	-4.2	2.5	-13.4	...	-6.7	-9.8	-11.6
2010	1.3	1.9	0.3	-3.7	...	1.3	3.2	3.5
2011	1.0	-0.2	-0.7	0.3	...	-0.1	7.0	5.3
Q4 10	2.2	2.1	-0.7	3.3	...	2.2	6.9	7.2
Q1 11	1.9	-0.6	-0.7	0.0	...	0.4	10.6	8.5
Q2 11	1.7	0.2	0.1	0.0	...	-0.2	8.0	4.5
Q3 11	0.1	-0.6	-1.1	0.4	...	0.0	5.4	6.2
Q4 11	0.6	0.0	-1.1	0.8	...	-0.6	4.5	2.3
	Real growth compared with previous quarter (seasonally adjusted), per cent							
Q4 10	-0.5	-0.4	-0.3	-1.2	...	-0.2	1.3	2.4
Q1 11	0.4	-0.2	-0.5	-4.6	...	-1.0	4.1	1.1
Q2 11	0.2	-0.3	1.1	4.9	...	1.0	-0.5	1.5
Q3 11	-0.1	-0.4	-1.4	0.9	...	-0.2	0.4	1.0
Q4 11	0.2	1.3	-0.2	-0.6	...	-0.2	0.4	-1.3

EU-HARMONIZED INDEX OF CONSUMER PRICES (HICP) AND UNDERLYING INFLATION (IMI)

Table 21

	HICP							Index of net retail prices[1]		
		Subcomponents:								
					Administered prices		HICP excl. energy, food and administered prices[3]	Index of net retail prices excl. energy, food and administered prices[3]	Split into[4]:	
	Total	Energy	Food	Core inflation[2]	Rent	Public services			Import content[5]	IMI[6]
	Weights, per cent									
	100	11.4	18.1	70.5	8.2	4.1	58.2	53.1	14.7	38.4
	Year-on-year growth, per cent									
2007	1.7	0.3	3.7	1.3	2.1	0.6	1.2	1.4	1.4	1.4
2008	3.6	7.7	6.7	2.1	2.8	3.5	1.9	2.1	4.0	1.1
2009	1.1	-4.0	0.5	2.0	3.1	4.8	1.7	1.9	-4.3	5.1
2010	2.2	9.2	2.1	1.2	2.8	3.9	0.8	0.9	1.7	0.5
2011	2.7	8.9	4.0	1.4	3.0	2.4	1.1	0.9	4.8	-0.9
Q1 09	1.7	-4.6	3.2	2.2	2.7	4.2	2.0	2.3	-1.9	4.4
Q2 09	1.1	-5.5	0.7	2.2	3.1	5.0	1.9	2.1	-4.2	5.2
Q3 09	0.6	-5.9	-0.5	2.0	3.5	5.1	1.6	1.9	-6.0	6.0
Q4 09	0.9	0.3	-1.5	1.6	2.9	4.9	1.2	1.6	-5.0	4.9
Q1 10	1.9	8.9	0.0	1.4	2.9	3.7	1.0	1.2	-1.3	2.3
Q2 10	2.0	10.1	0.8	1.1	2.8	3.9	0.7	0.7	1.0	0.6
Q3 10	2.3	8.8	3.2	1.1	2.5	4.0	0.8	0.9	3.2	-0.2
Q4 10	2.5	9.1	4.5	1.1	2.9	4.0	0.7	0.8	3.8	-0.6
Q1 11	2.6	9.3	3.4	1.4	2.9	3.7	1.0	0.8	5.4	-1.3
Q2 11	2.9	9.0	4.9	1.5	2.8	2.0	1.3	1.3	6.0	-0.9
Q3 11	2.6	9.3	3.3	1.4	3.2	1.9	1.1	0.9	4.2	-0.7
Q4 11	2.5	8.2	4.4	1.2	3.0	2.1	0.9	0.6	3.5	-0.7

Note: The weights reflect the weighting basis as of January 2012.

[1] Prices in the index of net retail prices are compiled excluding indirect taxes and subsidies.

[2] Core inflation is defined as the increase in HICP excluding energy and food.

[3] Goods and services excluding energy. food and administered prices constitute 60.9 per cent of HICP's weight basis and 53.2 per cent of the index of net retail prices. The difference reflects that the same goods and services do not count equally in the two indices. and does not express the indirect taxation content of the consumer prices.

[4] The division of the index of net retail prices into import and IMI is based on Statistics Denmark's input-output table.

[5] The indirect energy content is included in the import content.

[6] IMI expresses the domestic market-determined inflation. For a detailed presentation of IMI. see Bo William Hansen and Dan Knudsen. Domestic Market-Determined Inflation. Danmarks Nationalbank. *Monetary Review*. 4th Quarter 2005.

SELECTED MONTHLY ECONOMIC INDICATORS — Table 22

	Unemployment Per cent of labour force		Quantity index		Forced sales of real property	New passenger car registrations	Consumer confidence indicator	Composite cyclical Indicator for		
	Gross [1]	Net	Manufacturing industry [2]	Retail trade				Manufacturing industry	Building and construction	Service [3]
			2005=100	2005=100	Number		Balance per cent			
2007	3.7	2.8	107.0	104.9	1,392	162,480	7.5	5	9	20
2008	2.7	1.9	106.7	101.7	2,840	150,664	-7.7	-7	-16	3
2009	4.9	3.6	88.2	97.0	4,140	112,248	-5.0	-17	-44	-13
2010	6.2	4.3	90.6	96.7	5,222	153,613	1.8	3	-35	4
2011	6.1	4.1	94.8	95.3	5,025	169,793	-1.9	4	-20	...
					Seasonally adjusted					
Feb 11	6.1	4.1	90.6	96.0	422	13,951	-0,2	4	-21	10
Mar 11	6.1	4.1	92.6	96.0	386	14,588	1,6	1	-16	7
Apr 11	6.0	4.0	95.5	96.6	399	13,724	-0,1	9	-20	13
May 11	6.1	4.1	98.4	95.3	396	14,790	0,7	12	-16	7
Jun 11	6.1	4.1	94.6	94.9	353	13,959	3,0	4	-20	10
Jul 11	6.2	4.1	97.9	94.1	390	14,101	-1,6	6	-18	9
Aug 11	6.2	4.2	94.1	94.6	413	13,717	-2,9	4	-20	0
Sep 11	6.1	4.1	94.8	94.6	444	13,604	-4,1	0	-16	-3
Oct 11	6.1	4.1	94.5	94.7	424	13,259	-5,8	0	-17	-9
Nov 11	6.1	4.1	95.4	94.4	467	14,610	-8,3	1	-19	-5
Dec 11	6.1	4.0	95.9	94.3	471	14,851	-6,8	5	-23	-1
Jan 12	6.0	4.0	97.6	94.7	408	14,200	-7,8	6	-22	0
Feb 12	...	...	...	...	477	...	-4,7	9	-24	-2

[1] Including persons in activation programmes.
[2] Excluding shipbuilding.
[3] Revised as from May 2011.

SELECTED QUARTERLY ECONOMIC INDICATORS — Table 23

	Employment		Hourly earnings			Property prices (purchase sum, one-family dwellings)
	Total	Private	All sectors in Denmark, total	Manufacturing industry in Denmark	Manufacturing industry abroad	As a percentage of property value 2006
	1,000 persons		1996=100			
2007	2,903	2,061	151.4	152.1	138.0	104.8
2008	2,952	2,114	158.1	158.5	142.6	100.1
2009	2,856	2,006	162.9	163.2	145.2	88.1
2010	2,793	1,932	166.6	167.4	149.1	90.5
2011	2,776	1,928	169.6	171.3	152.7	...
	Seasonally adjusted					
Q4 10	2,787	1,931	167.7	168.9	150.1	90.9
Q1 11	2,781	1,928	168.6	170.1	151.3	89.3
Q2 11	2,781	1,931	169.1	170.8	152.2	90.1
Q3 11	2,769	1,925	169.8	171.9	153.1	86.8
Q4 11	2,771	1,929	170.9	173.1	154.1	...
	Change compared with previous year, per cent					
2007	2.8	4.1	3.8	4.0	3.0	4.6
2008	1.7	2.6	4.4	4.2	3.3	-4.5
2009	-3.3	-5.1	3.0	2.9	1.9	-12.0
2010	-2.2	-3.7	2.3	2.6	2.7	2.8
2011	-0.6	-0.2	1.8	2.3	2.4	...
Q4 10	-0.7	-1.0	2.2	2.4	2.4	2.9
Q1 11	-0.4	-0.2	1.8	2.3	1.9	0.6
Q2 11	-0.6	-0.2	1.9	2.2	2.4	-1.0
Q3 11	-0.9	-0.4	1.7	2.3	2.5	-4.9
Q4 11	-0.6	-0.1	1.9	2.5	2.7	...

EXCHANGE RATES — Table 24

	EUR	USD	GBP	SEK	NOK	CHF	JPY
	Kroner per 100 units						
	Average						
2007	745.06	544.56	1,089.81	80.57	92.99	453.66	4.6247
2008	745.60	509.86	939.73	77.73	91.02	469.90	4.9494
2009	744.63	535.51	836.26	70.18	85.39	493.17	5.7296
2010	744.74	562.57	869.02	78.15	93.02	540.60	6.4299
2011	745.05	536.22	859.05	82.52	95.61	605.74	6.7378
Feb 11	745.55	546.27	880.93	84.84	95.34	574.71	6.6116
Mar 11	745.74	532.75	860.72	83.93	95.26	579.63	6.5200
Apr 11	745.74	516.75	844.58	83.10	95.52	574.38	6.1913
May 11	745.66	519.65	849.47	83.24	95.13	594.77	6.4033
Jun 11	745.81	518.67	839.89	81.73	95.21	617.16	6.4487
Jul 11	745.60	522.76	842.79	81.63	95.80	634.03	6.5852
Aug 11	744.98	519.42	849.80	81.29	95.66	665.74	6.7465
Sep 11	744.62	540.93	854.23	81.53	96.42	620.73	7.0446
Oct 11	744.42	543.31	855.34	81.68	96.09	605.47	7.0880
Nov 11	744.12	549.01	867.90	81.43	95.56	604.63	7.0872
Dec 11	743.41	564.20	880.88	82.44	95.99	605.63	7.2509
Jan 12	743.53	576.24	893.58	84.02	96.88	614.10	7.4870
Feb 12	743.41	562.22	888.28	84.29	98.44	615.89	7.1696

EFFECTIVE KRONE RATE — Table 25

Average	Nominal effective krone rate	Consumer-price indices		Real effective krone rate based on consumer prices	Real effective krone rate based on hourly earnings	Consumer-price index in the euro area
		Denmark	Abroad			
	1980=100					2005=100
2007	103.2	250.5	238.7	108.3	113.1	104.4
2008	105.8	259.0	246.9	111.1	117.1	107.8
2009	107.8	262.4	247.3	114.9	121.0	108.1
2010	104.0	268.4	251.6	111.6	116.8	109.8
2011	103.6	275.8	258.5	111.1	116.1	112.8
Feb 11	102.9	273.9	255.6	110.7	...	111.0
Mar 11	103.8	275.4	257.3	111.4	115.5	112.5
Apr 11	104.7	276.5	258.4	112.1	...	113.1
May 11	104.3	276.9	258.8	111.8	...	113.1
Jun 11	104.5	276.3	258.6	111.8	116.7	113.1
Jul 11	104.1	276.0	258.7	111.3	...	112.4
Aug 11	104.2	276.0	259.1	111.3	...	112.6
Sep 11	103.4	276.9	259.8	111.0	116.3	113.5
Oct 11	103.5	277.4	260.1	111.1	...	113.9
Nov 11	103.3	277.1	260.2	110.9	...	114.0
Dec 11	102.4	277.1	260.9	109.9	116.0	114.4
Jan 12	101.4	278.0	260.6	109.4	...	113.4
Feb 12	101.7	...	...	...	...	...
	Change compared with previous year, per cent					
2007	1.6	1.7	2.3	0.9	2.5	2.2
2008	2.5	3.4	3.4	2.6	3.5	3.3
2009	1.9	1.3	0.2	3.4	3.3	0.3
2010	-3.6	2.3	1.7	-2.8	-3.4	1.6
2011	-0.3	2.8	2.7	-0.5	-0.6	2.7
Feb 11	-2.7	2.7	2.5	-2.4	...	2.4
Mar 11	-1.6	2.7	2.6	-1.7	-2.5	2.7
Apr 11	-0.1	2.9	2.8	-0.3	...	2.8
May 11	1.0	3.1	2.8	0.5	...	2.7
Jun 11	2.2	3.0	2.8	1.5	0.1	2.7
Jul 11	1.1	2.9	2.9	0.6	...	2.5
Aug 11	1.4	2.6	2.9	0.6	...	2.5
Sep 11	0.6	2.5	3.0	0.1	0.4	3.0
Oct 11	-0.9	2.8	2.9	-0.6	...	3.0
Nov 11	-0.5	2.6	2.8	-0.4	...	3.0
Dec 11	-0.3	2.5	2.5	0.1	-0.4	2.7
Jan 12	-1.1	2.8	2.5	-0.3	...	2.6
Feb 12	-1.1	...	...	...	...	...

Note: The nominal effective krone rate index is a geometric weighting of the development in the Danish krone rate against currencies of Denmark's 27 most important trading partners. However, only 25 countries are included in the calculation of consumer prices abroad and the real effective krone rate based on consumer prices and hourly earnings, respectively.

As from April 2010 the weights are based on trade in manufactured goods in 2009 and earlier on trade in manufactured goods in 2002.

An increase in the index reflects a nominal or a real appreciation of the krone.

Danmarks Nationalbank's Statistical Publications

Periodical electronic publications
Danmarks Nationalbank releases new financial statistics to the public in electronic publications composed of 2 elements:

- **"Nyt" (News)** describing the key development trends.
- **Tabeltillæg (Tables Supplement)** containing tables with as detailed specifications as possible.

"Nyt" is available in Danish only, whereas the tables supplement and the corresponding sources and methodologies also are available in English.

Statistics databank
The above publications are supplemented by a statistics database comprising all time series which are updated concurrent with a release. The time series include data as far back in time as possible. The statistical data from Danmarks Nationalbank are published through Statistics Denmark's "StatBank Denmark". Danmarks Nationalbank's part of the "StatBank Denmark" is available directly via:
nationalbanken.statbank.dk

Special Reports
Special Reports deal with statistics of a thematic character and are not prepared on a regular basis.

Release calendar
A release calendar for the statistical publications, covering the current month and the following quarter, is available on:
www.nationalbanken.dk (see Statistics > Release calendar).