Danmarks Nationalbank

Monetary Review 1st Quarter Part 1

2013

DANMARKS NATIONAL BANK 2013

MONETARY REVIEW 4th QUARTER 2013, Part 1

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

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SUMMARY

The international economy is recovering at a modest pace, but with large regional differences. An upswing is underway in the USA despite considerable fiscal tightening, and the euro area economy has now grown slightly for two consecutive quarters, driven by, *inter alia*, private consumption and investment. Economic activity in the emerging economies has slowed down a little.

In the euro area, the north-south government yield spread has narrowed. This indicates that tensions in the financial markets are easing and that the economic outlook has become brighter. The spread between bank lending rates has also narrowed, but there are still large differences across member states. The same applies to credit growth, which is negative for the euro area overall.

Growth in the world economy is expected gradually to accelerate in the coming years, mainly driven by the USA. The expected negative growth in the euro area for 2013 as a whole will make way for positive growth of around 1 per cent in 2014.

The Danish economy has shown positive growth for the last two quarters. This mainly reflects rising exports and public consumption, while private consumption has not picked up so far. Consequently, it is not yet clear whether a self-sustaining upswing has set in.

The housing market is improving, and in some regions, notably around Copenhagen, prices have risen fairly strongly over the last year. Gross unemployment has fallen during 2013, reaching the lowest level in four years in October. The downward trend is particularly strong among the unskilled and in the construction sector. There is still considerable spare capacity in the labour market, but nevertheless, the first signs of a tightening of the labour market are beginning to emerge.

In the coming years, private consumption is expected to fuel growth in the gross domestic product, GDP. Fiscal policy is as expansionary as the Budget Act and the Fiscal Compact permit and its impact on GDP growth is expected to be more or less neutral in 2014. GDP is expected to grow by 0.4 per cent this year, rising to 1.5 per cent next year and 1.6 per cent in 2015, entailing that the negative output gap will gradually narrow in the coming years. Developments in the housing and labour markets

should be monitored closely to ensure that the expected upswing is sustainable and to prevent imbalances in the economy.

The forecast risks are assessed to be slightly more on the upside than previously.

THE INTERNATIONAL ECONOMY AND THE FINANCIAL MARKETS

Economic development and growth outlook

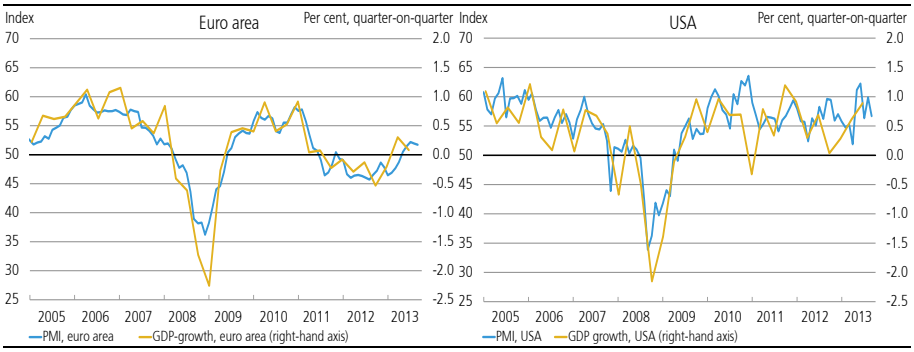
The international economy is growing at a moderate pace. Activity is rising in the advanced economies, with positive signals in the USA in particular, while the pace of growth has slackened in the emerging economies.

The euro area economy grew by 0.1 per cent in the 3rd quarter, compared with 0.3 per cent in the 2nd quarter. In other words, growth has been marginally positive for two consecutive quarters. The weaker growth in the 3rd quarter primarily reflects more subdued activity in Germany and a small decrease in the French GDP. Among the crisis-ridden member states, the Spanish economy grew for the first time since the 1st quarter of 2011, while both Ireland and Portugal have seen positive growth for two quarters running. The composite Purchasing Managers' Index, PMI, which provides a good indication of where the economy is heading, points to continued moderate growth in economic activity in the 4th quarter, cf. Chart 1 (left).

The US economy accelerated in the 3rd quarter, growing by 0.9 per cent, cf. Chart 1 (right). The partial government shutdown in October is expected to have only a weak negative impact on activity in the 4th quarter, and the PMI indicator still points to sound growth.

In the UK, the economy began to pick up a couple of quarters earlier than in the euro area. The upswing seems to have become rooted, as

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



Note: The indices are the Purchasing Managers' Index, PMI, for manufacturing and services (composite output).
Source: Reuters EcoWin.

GDP has now grown for three quarters in a row – most recently by 0.8 per cent in the 3rd quarter. The improved economic activity is primarily attributable to rising private consumption and investment.

The Japanese economy has responded positively to the easing of monetary policy and the government's fiscal stimulus at the beginning of the year. All the same, GDP growth fell to 0.3 per cent in the 3rd quarter, following two quarters with quarterly growth of approximately 1 per cent.

Economic activity in the emerging economies has slowed down a little after a long period of high growth. For the emerging and developing economies overall, GDP growth has fallen by 3 percentage points, from 7.5 per cent in 2010 to 4.5 per cent in 2013.

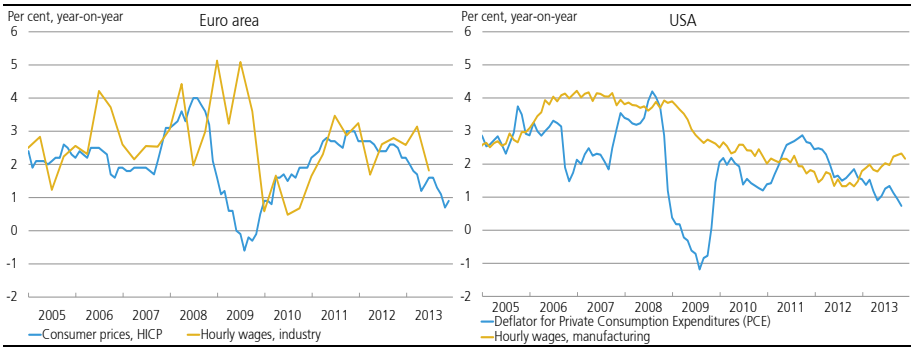
Euro area unemployment has been virtually constant at 12.1 per cent for the last six months, while employment has declined. In several euro area member states – including Germany, Portugal and Ireland – unemployment has fallen since the turn of the year. US unemployment has been falling since 2009 and stood at 7.0 per cent in November. This reflects rising employment as well as a decrease in the participation rate.

The high level of unemployment in the euro area helps to curb wage pressures, cf. Chart 2 (left). This has an impact on prices, and since the beginning of 2012 core inflation has fallen, to 1 per cent in November, in step with the slowdown in wage inflation. The increase in the overall consumer price index, which is also affected by factors such as falling energy prices, has declined from more than 3 per cent at end-2011 to 0.9 per cent in November. The appreciation of the nominal effective exchange rate of the euro by approximately 10 per cent from the summer of 2012 until October has contributed to the subdued price development. Studies by the International Monetary Fund, IMF, among others, show that a 10-per-cent appreciation of the nominal effective euro rate would, viewed in isolation, reduce euro area inflation by around 1 percentage point after 18 months[1].

In the USA, the rate of inflation has also fallen. The Private Consumption Expenditures, PCE, deflator (which is the Federal Reserve's preferred measure of price development) has declined from almost 3 per cent in mid-2011 to 0.7 per cent in October, cf. Chart 2 (right). Wage inflation, on the other hand, has risen, which could indicate increased capacity pressures in the economy. The exchange rate is of less significance to price developments in the USA than in the euro area, one reason being

[1] Hamid Faruqee, Exchange rate pass-through in the euro area, *IMF Staff Papers*, Vol. 53, No. 1, 2006.

PRICE AND WAGE DEVELOPMENTS IN THE EURO AREA AND THE USA Chart 2



Source: Reuters EcoWin.

that many commodity prices are quoted in dollars. In addition, the USA relies less on imports for domestic production[1].

The oil price (Brent) was 125 dollars per barrel at the beginning of 2012, but had fallen to 112 dollars by early December. Prices of oil futures indicate that the market expects the price to fall to 106 dollars per barrel in the coming year. In addition to reducing production costs and consumer prices, lower oil prices will have a positive impact on economic activity in both the euro area and the USA, e.g. via higher increases in real disposable income.

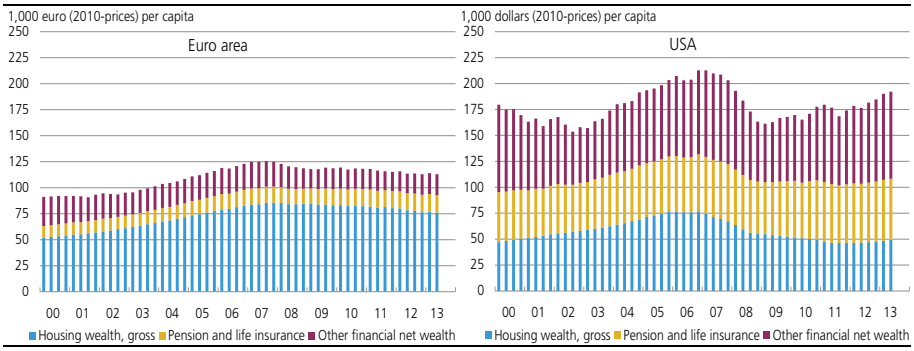
Since 2011, domestic demand in the euro area has had a negative impact on economic activity. Private consumption has fallen, partly because real wages have fallen, and fiscal policy has been tightened. These factors are fading away, resulting in a less pronounced downward trend in real disposable income. This has supported growth in private consumption, which has now risen slightly for two consecutive quarters.

For the euro area overall, real net household wealth per capita has declined slightly since 2007, cf. Chart 3 (left). However, there is a wide spread between the northern and southern euro area member states. In the north, net wealth has risen a little since 2009 due to small increases in both housing wealth and financial wealth, while in the south, net wealth has decreased steadily since the onset of the crisis, especially as a result of shrinking housing wealth. Moreover, households in some euro area member states are reducing their debt and are faced with the prospect of a further decline in wealth due to falling house prices.

Business investment has also fallen markedly since 2011 due to spare capacity and a weak economic outlook. But a recovery also seems to be on its way in this area, as investment rose in both the 2nd and 3rd quar-

[1] Linda S. Goldberg and José Manuel Campa, The sensitivity of the CPI to exchange rates: distribution margins, imported inputs, and trade exposure, *The Review of Economics and Statistics*, May 2010.

REAL NET HOUSEHOLD WEALTH IN THE EURO AREA AND THE USA Chart 3



Note: Housing wealth in the euro area includes Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Portugal and Spain. Net wealth has been deflated to 2010 prices using the aggregate consumer price index.

Source: OECD, Reuters EcoWin, Jacob Isaksen, Paul L. Kramp, Louise F. Sørensen and Søren V. Sørensen, Household balance sheets and debt – an international country study, *Monetary Review*, Danmarks Nationalbank, 4th Quarter 2011, Part 2, and own calculations.

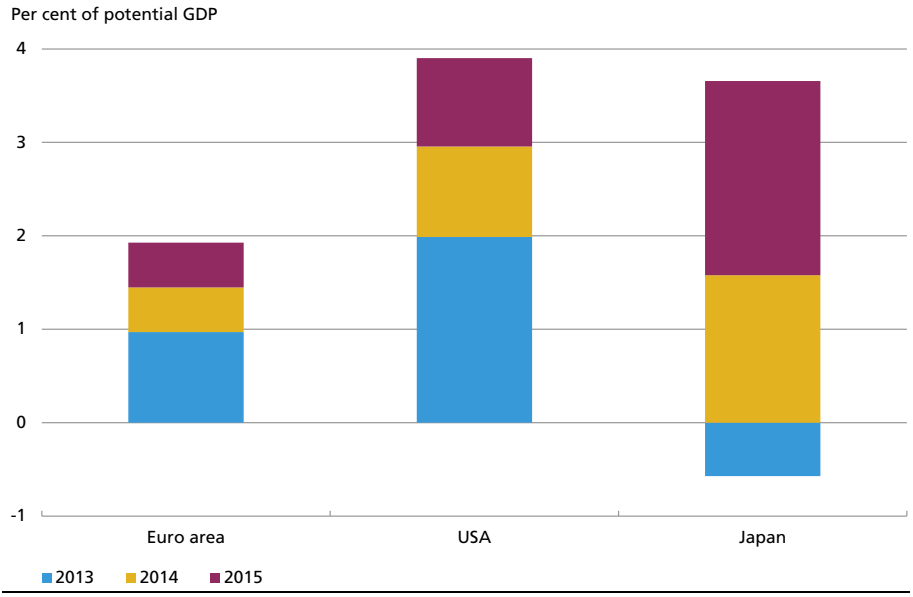
ters. This reflects a more positive view of future sales opportunities and better financial conditions. Net exports have shown a positive trend since 2010, despite weak global demand and the appreciation of the euro since the summer of 2012. This is mainly attributable to lower domestic demand, but also to improved wage competitiveness in southern Europe.

The European Commission expects that domestic demand will slowly become the main driver of modest economic growth in the euro area in the coming years. The rate of fiscal consolidation is declining further, cf. Chart 4. Combined with subdued price development, this will, in the assessment of the Commission, support growth in real disposable income for the first time in several years. This will have a stronger effect on private consumption than the slight fall in net wealth. Banks are better capitalised and have improved their liquidity situation, which will contribute to a gradual improvement in credit conditions, cf. the lending survey conducted by the European Central Bank, ECB. This will encourage investment, as will low interest rates. The ECB expects to keep its interest rates at a low level for an extended period of time.

Despite considerable fiscal tightening, the economic recovery in the USA is driven by domestic private-sector demand. Private consumption is supported by the development in household net wealth, cf. Chart 3 (right). Especially financial wealth has risen since 2009 on account of rising stock indices. Housing wealth has also increased a little since 2012 as house prices have risen.

According to the international organisations, domestic demand is also expected to drive rising economic activity in the coming years. Above all, the housing market is expected to contribute. Residential investment is

FISCAL TIGHTENING IN SELECTED ADVANCED ECONOMIES, 2013-15 Chart 4



Note: Change in the underlying primary balance relative to the preceding year.
Source: OECD, *Economic Outlook*, November 2013.

at a very low level, and the excess capacity that was built up before the crisis has now almost been eliminated. Activity is also supported by a less pronounced tightening of fiscal policy, although uncertainty about US fiscal policy remains great, cf. Box 1.

ESTIMATED GDP GROWTH IN SELECTED ECONOMIES Table 1

Per cent	2012	2013	2014	2015	Change relative to May 2013	
					2013	2014
USA	2.8	1.7	2.9	3.4	-0.2	0.1
Euro area	-0.6	-0.4	1.0	1.6	0.2	0.0
Germany	0.9	0.5	1.7	2.0	0.2	-0.3
France	0.0	0.2	1.0	1.6	0.4	0.2
Italy	-2.6	-1.9	0.6	1.4	-0.1	0.1
Spain	-1.6	-1.3	0.5	1.0	0.4	0.1
UK	0.1	1.4	2.4	2.5	0.6	0.8
Japan	1.9	1.8	1.5	1.0	0.2	0.1
China	7.7	7.7	8.2	7.5	-0.1	-0.2
Brazil	0.9	2.5	2.2	2.5	-0.4	-1.3
Russia	3.4	1.5	2.3	2.9	-0.8	-1.2
India	3.8	3.0	4.7	5.7	-2.2	-1.7

Note: Change relative to the previous OECD forecast from May 2013.
Source: OECD, *Economic Outlook*, November 2013.

As regards Japan, GDP growth in the coming years will be dampened by tighter fiscal policy, including a VAT increase from 5 to 10 per cent over the next two years. But in October the government announced both temporary and permanent fiscal easing to mitigate the negative impact on activity in the short term.

Overall, the international economy is set to pick up steam gradually, cf. Table 1. The recovery is expected to be driven mainly by the USA, while the euro area economy will move at a more moderate pace. The

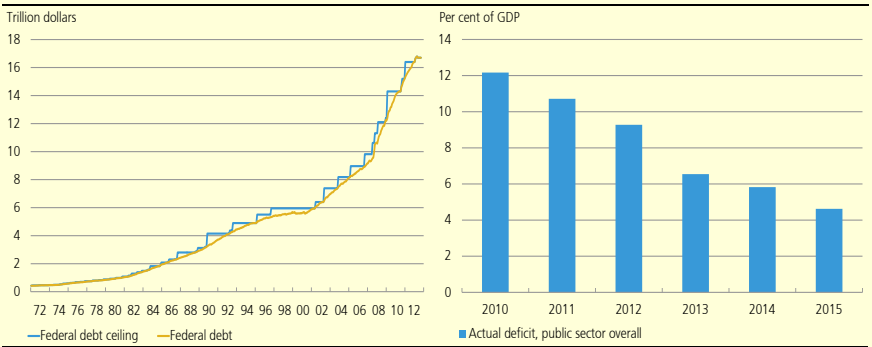
US FISCAL POLICY — Box 1

At the start of the new fiscal year, which began on 1 October, no agreement had been reached on financing of non-statutory expenses in the USA. Consequently, parts of the public sector had to shut down in the period 1-16 October. Negotiations on new grants were linked to negotiations to raise the federal debt ceiling. The latter has previously been a more or less automatic procedure, cf. Chart 5 (left).

The US Treasury had announced that on 17 October the extraordinary measures for temporary circumvention of the debt ceiling would be depleted. Just before this deadline, an agreement was reached which ensured new budget grants until 15 January 2014 and suspended the debt ceiling until 7 February. The debt ceiling will enter into force on 8 February at a level that includes borrowing in the intervening period. Once again, the Treasury will be able to use extraordinary measures to temporarily circumvent the debt ceiling. In the assessment of the Congressional Budget Office, CBO, these measures will not expire until sometime between March and May or June.

As part of the agreement, a budget conference committee was set up to try to reach agreement on an overall level of expenses for the current fiscal year (1 October 2013 – 30 September 2014) by 13 December. The committee will also consider whether the automatic savings mechanism that took effect in March can be replaced by other measures. The government deficit is expected to fall until 2015 as a result of fiscal tightening and the economic upswing, cf. Chart 5 (right).

US FEDERAL DEBT AND DEBT CEILING (LEFT) AND ACTUAL DEFICIT FOR THE PUBLIC SECTOR OVERALL (RIGHT) — Chart 5



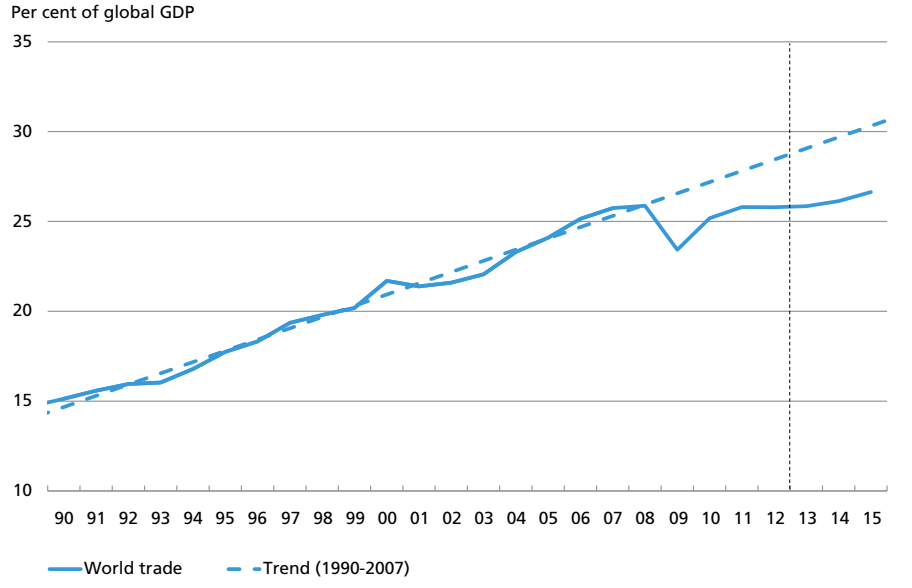
Source: Reuters EcoWin and OECD, *Economic Outlook*, November 2013.

expected negative growth rate in the euro area for 2013 as a whole will make way for positive growth of around 1 per cent in 2014. In the emerging economies, economic activity is expected to grow at varying paces across the countries, although the growth outlook has been adjusted downwards since the spring.

In view of the subdued international economic outlook, the international organisations expect growth in world trade to remain below the pre-crisis level in the coming years, cf. Chart 6. But the ECB, the Organisation for Economic Co-operation and Development, OECD, and others have also pointed out that there may have been a structural fall in the relationship between global trade and GDP in recent years. In the period 1990-2007, world trade grew by an average of around 2.5 per cent when GDP rose by 1 per cent. Looking ahead, the OECD expects world trade to grow by only 1.5 per cent or so when GDP rises by 1 per cent.

In the period leading up to the crisis, integration of the emerging economies, including China, had a major impact on the development in world trade. China's exports rose to 10 per cent of total global exports in 2012. However, growth in China is expected to rely less on exports in future. Another significant factor behind the rise in world trade in the pre-crisis period was the increased split-up of firms' production chains and the development of "global value chains". Technological advances,

WORLD TRADE Chart 6



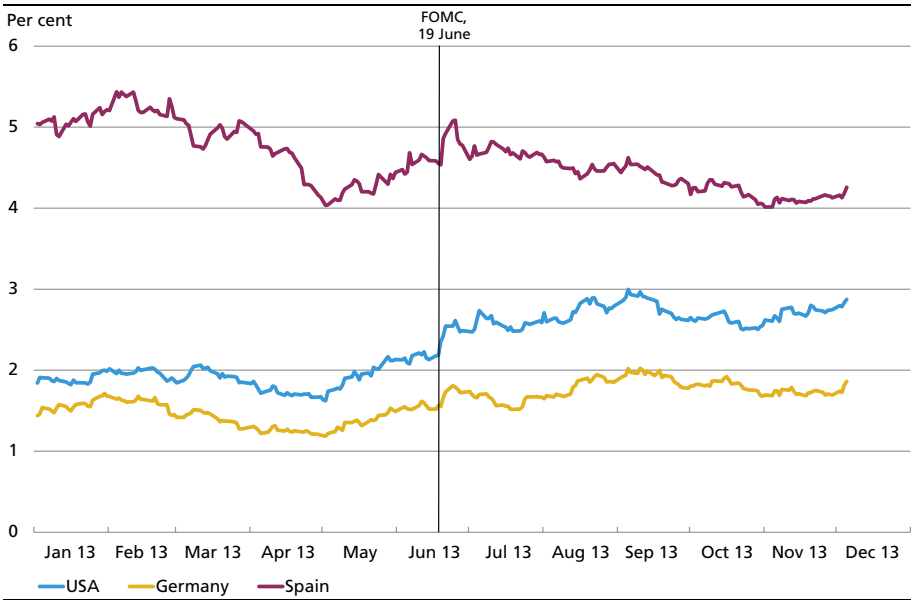
Note: World trade is an average of world exports and imports.
Source: Reuters EcoWin, OECD, *Economic Outlook*, November 2013, and own calculations.

especially within transport and communication, made it easier and cheaper to trade. But a profitable split-up of the production chain is possible only so many times, and there is thus a natural limit to how much global value chains will be able to drive world trade in future.

Financial conditions

On 19 June, the Federal Reserve announced that a reduction of the pace of its asset purchases might be relevant later in the year if the economy developed as expected. This announcement led the financial markets to expect a tighter monetary-policy stance, which in turn led to notable yield rises for 10-year government bonds, cf. Chart 7. However, in September the Federal Reserve announced that it would await more evidence before adjusting the pace of its purchases. The background was a tightening of financial conditions over the summer, as well as weaker-than-expected key ratios for the e.g. the labour market. As a result, the rise in long-term government bond yields to some extent reversed. Nevertheless, in early December the yield on a 10-year US Treasury bond was still approximately 1.2 percentage points higher than in early May. In connection with the October meeting the Federal Reserve indicated that the pace may very well be moderated at one of the forthcoming meetings if the economic data shows a positive devel-

YIELDS ON 10-YEAR GOVERNMENT BONDS, SELECTED COUNTRIES — Chart 7



Note: FOMC, 19 June indicates the meeting of the Federal Open Market Committee at which the Federal Reserve announced that it might reduce the pace of its asset purchases later in the year if the economy developed as expected.

Source: Reuters EcoWin.

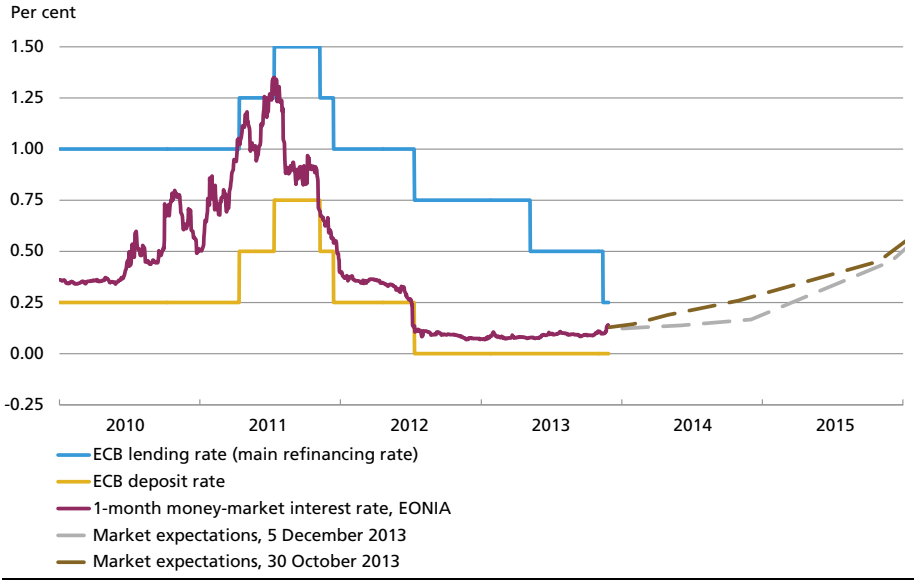
opment, as expected. At the same time, the financial markets (measured by Fed Funds Futures) are factoring in a Fed Funds Rate that will remain at around the current low level for the next year.

In the euro area, the government yield spread between the northern and southern member states has narrowed, reflecting easing of tensions in the financial markets and an improved economic outlook in the last few months. Expectations of an economic recovery are also reflected in the stock indices, with the benchmark indices in both the USA and the euro area continuing the positive trend seen since June 2012. The price of gold has been falling since the autumn of 2012.

On 7 November, the ECB reduced its main refinancing rate by 0.25 percentage point to 0.25 per cent, citing recent indications of further diminishing underlying price pressures, cf. Chart 8. The deposit rate was kept at 0 per cent. As a result, market expectations changed so that in early December the financial markets expected money-market interest rates to remain more or less unchanged for the next year and only then to start rising gradually. The ECB did not change its interest rates at the meeting on 5 December.

Euro area bank lending rates have been falling since the end of 2011, which supports economic activity. Although spreads between member states have narrowed in recent months, they remain large. This is seen

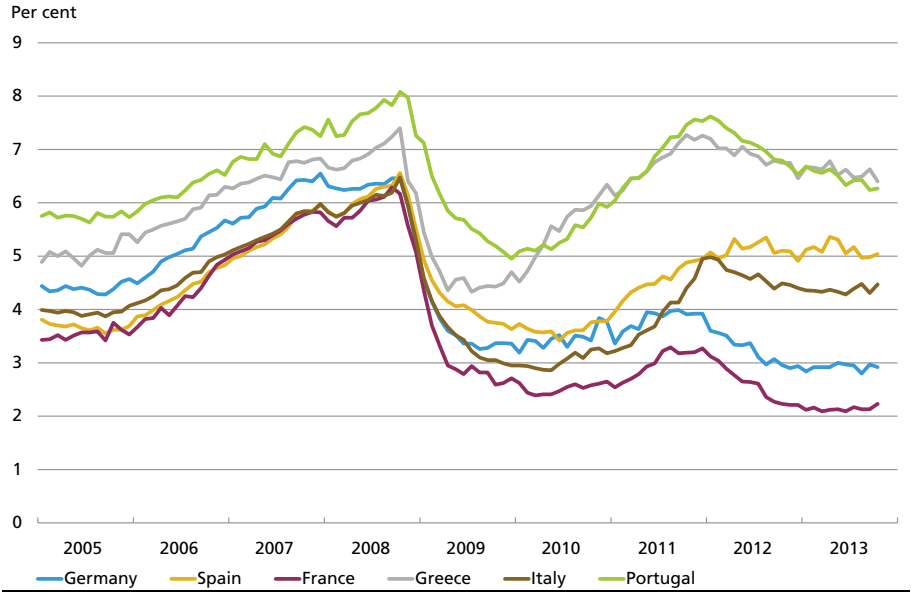
THE ECB'S MONETARY-POLICY INTEREST RATES AND THE 1-MONTH MONEY-MARKET INTEREST RATE — Chart 8



Note: Market expectations have been calculated implicitly on the basis of forward contracts for 1-month EONIA.
Source: Reuters EcoWin and Bloomberg.

LENDING RATES FOR NON-FINANCIAL CORPORATIONS, SELECTED COUNTRIES

Chart 9



Note: Uncollateralised loans below 1 million euro with maturities of up to 1 year. According to the European Commission, loans below 1 million euro are often used as an approximation of loans to small and medium-sized enterprises.

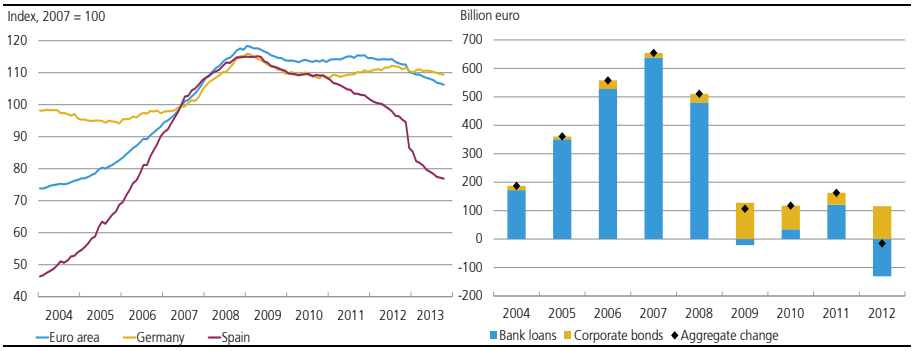
Source: ECB.

from the rates of interest on loans to large firms and especially to small and medium-sized enterprises, cf. Chart 9. The pattern is the same for collateralised and uncollateralised loans. Interest rates on corporate loans in Greece, Italy, Portugal and Spain are more or less at the pre-crisis level, while French and German interest rates are lower. For households, the picture is virtually the same – consumer loans for French and German households are less expensive than equivalent loans in other member states. The spread in lending rates reflects factors such as the banks' exposures to domestic government debt, as well as differences in firms' credit standings and the banks' balance sheets.

According to the ECB's October lending survey, credit conditions in the euro area were more or less unchanged compared with the preceding quarter, and for the first time since 2007 the banks expected to ease credit conditions. But lending by banks to non-financial corporations continues to fall, cf. Chart 10 (left), one of the reasons being that demand is low. However, the overall trend masks large differences within the euro area, reflecting economic developments during the crisis. In Spain, credit extension to both households and non-financial cor-

LENDING BY BANKS TO NON-FINANCIAL CORPORATIONS (LEFT) AND BORROWING BY NON-FINANCIAL CORPORATIONS IN THE EURO AREA (RIGHT)

Chart 10



Note: Right-hand chart: Borrowing by corporations is calculated as the change in the liabilities side of the corporations' balance sheets.
Source: ECB and Eurostat.

porations has dropped markedly since end-2009, while it remains virtually unchanged in Germany and France. This should be viewed in the light of pre-crisis developments.

In the euro area, increasing funding via corporate bonds has made up for the fall in bank lending, cf. Chart 10 (right). But issuance of corporate bonds varies across member states. In Germany, France and Italy, the fall in bank lending has been fully or partially offset by issuance of corporate bonds, whereas Spanish firms have issued only few corporate bonds. In the USA, issuance of corporate bonds has also risen considerably in recent years. Historically, corporate bonds have been a far more important source of funding in the USA.

On 15 October, the EU ministers for economic and financial affairs, the Ecofin Council, adopted the final structure of the Single Supervisory Mechanism, SSM, for the forthcoming European banking union. Consequently, the ECB will take over its new supervisory tasks on 4 November 2014. In preparation for the SSM, the ECB will conduct a comprehensive assessment of the largest banks in the banking union. This is to strengthen confidence in these banks and disclose any problems before the transition to the SSM. The assessment will comprise three connected elements. First, a risk assessment of the banks will be performed, including their liquidity, leverage and funding. The second element is an asset quality review, which is to increase transparency in relation to the banks' exposures. Finally, a stress test will be performed to investigate the banks' resilience to various stress scenarios.

The European Banking Authority, EBA, has recommended that the supervisory authorities in all 28 EU member states (in Denmark the Danish Financial Supervisory Authority) perform a similar review of

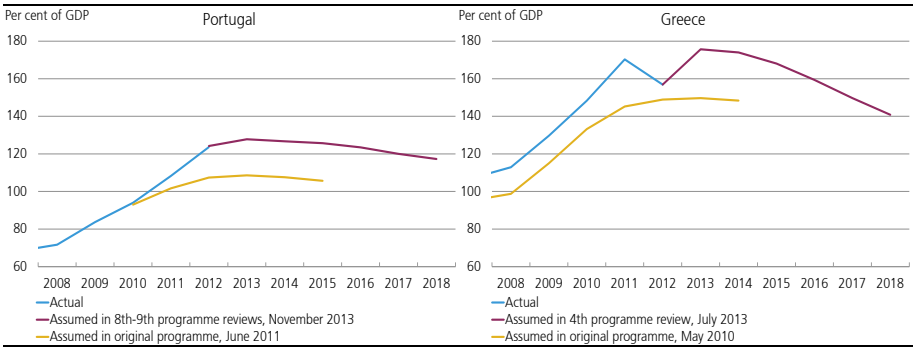
other banks. The results of the ECB's and the national supervisors' reviews will be included in the EBA's work to stress test the largest banks in all 28 member states. The overall results must be ready before the ECB takes over supervisory responsibilities, i.e. presumably in October 2014. There are no plans to communicate preliminary results before then.

Status of the financial assistance programmes for Greece, Ireland and Portugal

Large government deficits have caused the debt levels of Greece, Ireland and Portugal to soar in recent years. In Portugal and Greece, debts have grown more than assumed when the financial assistance programmes were concluded, cf. Chart 11, to some extent because of weaker-than-expected economic developments. In the case of Greece, the government deficit and debt have also been adjusted upwards for the years before the conclusion of the programme. At the same time, restructuring of the Greek debt in 2012 reduced it by only 14 per cent of GDP, even though it was written down by more than 50 per cent of GDP. One of the reasons is that funds were set aside for recapitalisation of banks. Projections in the most recent programme reviews show that the debt profiles of all three member states are expected to improve in 2013, despite continued government deficits and weak growth.

Only Ireland has observed the targets set in its financial assistance programme, and debt is expected to peak at 123 per cent of GDP in 2013. The Irish government has decided not to apply for a new programme when the current one expires on 15 December 2013. In this context it should be noted that Ireland has issued long-term government bonds on several occasions in 2012 and 2013, cf. Chart 12 (left), and demand has been high, with a broad investor base. In addition, Ireland has built up capital to cover its financing requirement until early 2015.

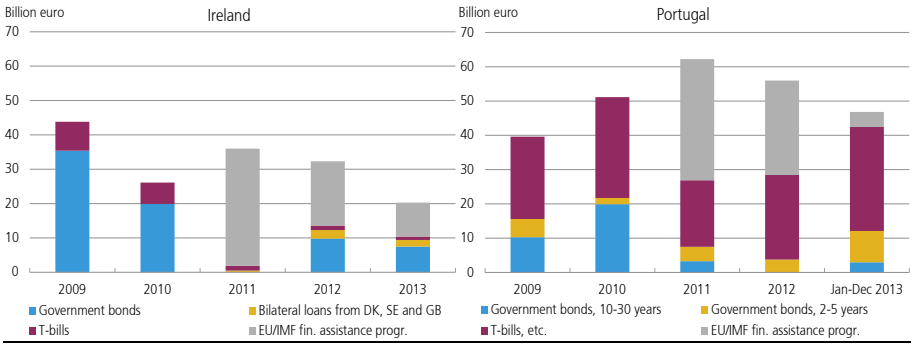
PUBLIC DEBT AND PROJECTION OF DEBT — Chart 11



Source: Reuters EcoWin, IMF and European Commission.

GOVERNMENT SECURITIES ISSUED AND DISBURSEMENTS UNDER BORROWING PROGRAMMES

Chart 12



Source: Portuguese Treasury and Debt Management Agency, Agência de Gestão da Tesouraria e da Dívida Pública, and Irish National Treasury Management Agency.

Portugal's debt is expected to peak at 128 per cent of GDP in 2013. Portugal has also obtained financing in the market during 2013, but has primarily done so by issuing T-bills, i.e. short-term securities, cf. Chart 12 (right). It will be necessary to issue far more long-term bonds in order to ensure that financing is in place before the financial assistance programme expires.

However, there is general uncertainty about whether Portugal can make the transition to full market-based financing, or whether a new financial assistance programme will be required when the current programme expires in June 2014. In the assessment of the Portuguese government, a preventive facility will be sufficient[1].

As already mentioned, the Greek debt has taken a much worse course than assumed, and the original target of a debt of 120 per cent of GDP in 2020 was adjusted upwards already in the first programme review. In that connection, the euro area member states agreed to improve the borrowing conditions and committed themselves to further measures to reduce the debt to 124 per cent of GDP by 2020 and less than 110 per cent of GDP by 2022. Moreover, Greece is faced with considerable challenges in relation to programme funding, as there are funding gaps of 4.4 and 6.5 billion euro in 2014 and 2015, respectively. The euro area member states have promised to meet these funding requirements, provided that Greece observes the conditions of the programme, which expires in 2016.

[1] A preventive facility is a loan resembling an overdraft facility from the IMF and/or the European Stability Mechanism, ESM. A preventive facility via the ESM also makes it possible to purchase government securities in the primary market.

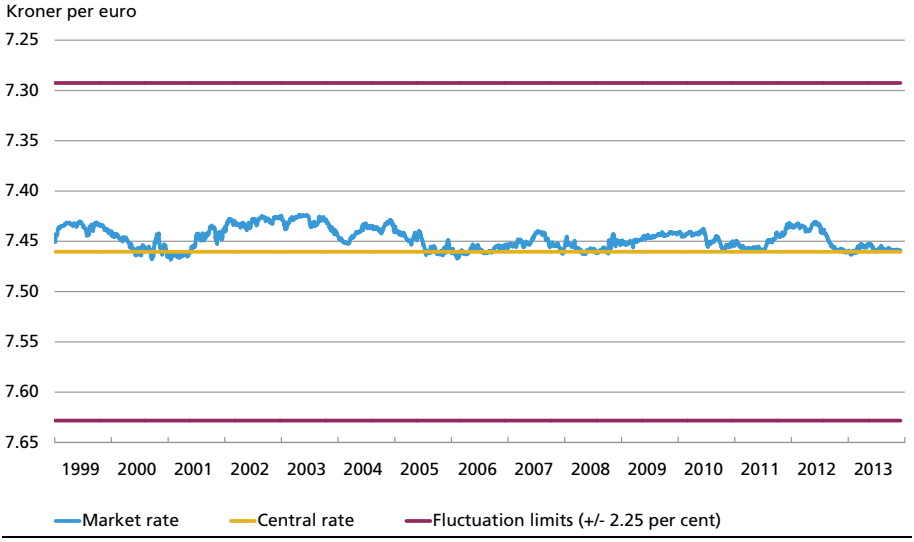
In the most recent programme review, the troika (the Commission, the ECB and the IMF) assessed that the government debts of all three member states are sustainable, despite considerable increases. This reflects the favourable programme borrowing terms, resulting in a decline in Greece's interest payments to just over 4 per cent of GDP, even though debt has risen to more than 175 per cent of GDP. Interest payments on government debts in Ireland and Portugal also make up just over 4 per cent of GDP, but in these cases interest expenses have risen, as the favourable borrowing terms have only partially offset the surge in debt.

MONETARY AND EXCHANGE-RATE CONDITIONS

In recent months, the krone has been stable vis-à-vis the euro at a level close to its central rate in ERM 2, cf. Chart 13. The krone first weakened and then strengthened marginally in October, only to weaken a little again towards the end of November. There are indications that turnover in the foreign-exchange market for Danish kroner has been lower than usual since the summer. That has not affected the stability of the exchange rate.

The foreign-exchange reserve was practically unchanged in September, October and November and amounted to kr. 489.3 billion at end-November. Danmarks Nationalbank has not intervened in the foreign-

EXCHANGE RATE OF THE KRONE VIS-À-VIS THE EURO Chart 13



Note: Reverse scale. The most recent observation is from 3 December 2013.
Source: Danmarks Nationalbank.

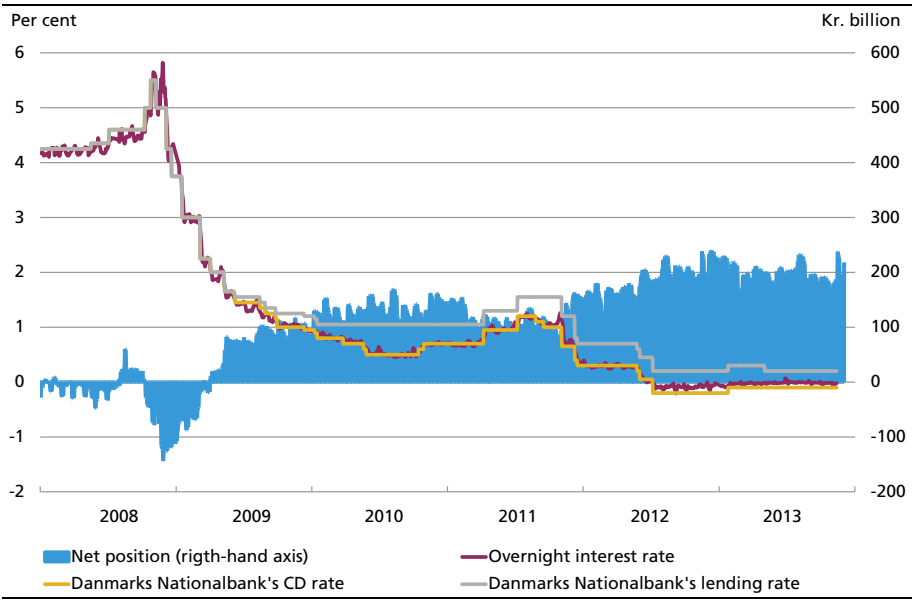
exchange market since January 2013; this is the longest period of non-intervention since the introduction of the euro.

Danmarks Nationalbank has not changed its monetary-policy interest rates since May 2013, when the lending rate was reduced. Effective 13 November, the ECB reduced its main refinancing rate by 0.25 percentage point to 0.25 per cent and its marginal lending rate by 0.25 percentage point to 0.75 per cent. The ECB's deposit rate was maintained at 0.00 per cent. Due to considerable excess liquidity in the euro area, money-market interest rates have been close to the deposit rate for the last couple of years, and this has also been the case since the interest-rate reduction. The narrowing of the spread between the lending and deposit rates also dampens potential fluctuations in euro area money-market interest rates.

In Denmark, the monetary-policy counterparties have a substantial need to place funds at Danmarks Nationalbank. This is reflected in a positive net position vis-à-vis Danmarks Nationalbank, cf. Chart 14. So in Denmark it is also the monetary-policy deposit rates that determine money-market interest rates and the exchange rate of the krone. Against that background, Danmarks Nationalbank has kept its interest rates unchanged.

THE BANKS' AND MORTGAGE BANKS' NET POSITION VIS-À-VIS DANMARKS NATIONALBANK, MONETARY-POLICY INTEREST RATES AND THE OVERNIGHT INTEREST RATE

Chart 14



Note: The overnight interest rate is a 5-day moving average of the turnover-weighted uncollateralised T/N rate. The most recent observations are from 3 December 2013.

Source: Danmarks Nationalbank.

Short-term money-market interest rates in Denmark have been stable since mid-September. Money-market interest rates for maturities of up to approximately 6 months were negative in early December. Danish interest rates have generally mirrored euro area money-market interest rates, but both short-term and long-term spreads have widened a little, thereby becoming more negative.

Market participants have focused on excess liquidity in the euro area, which decreased in October and November in step with premature redemptions of loans under the ECB's 3-year longer-term refinancing operations, LTROs. This made euro area money-market interest rates rise a little. In connection with the interest-rate reduction in November, the ECB decided to extend the period of fixed rate tender procedures with full allotment in both its main refinancing operations and the 3-month LTROs until mid-2015. The underlying reason is that the ECB wishes to reduce the risk of upward pressure on money-market interest rates as a result of ongoing reductions of excess liquidity.

In the last three months, 3-year loans from Danmarks Nationalbank totalling kr. 1.9 billion have been redeemed prematurely, bringing the total loan volume down to kr. 11.9 billion. A small part of the outstanding volume matures in March 2015, the rest in September 2015.

Since October 2011, monetary-policy counterparties have been able to raise 6-month loans from Danmarks Nationalbank. This will no longer be possible from 1 July 2014. Loans already raised will run until they mature. At the same time, the list of assets eligible as collateral for loans from Danmarks Nationalbank will be restored to normal. This means that banks' credit claims and sector company shares and bonds will no longer be part of Danmarks Nationalbank's collateral basis from 1 July 2014. The changes to the credit facilities and the collateral basis are described in more detail in the article "Normalisation of the Collateral Basis and Discontinuation of 6-Month Loans" in this Monetary Review.

In Danmarks Nationalbank's assessment, the credit institutions can handle these changes. Use of 6-month loans has been very limited, and the assets to be removed from the collateral basis have only to a modest extent been pledged as collateral to Danmarks Nationalbank.

Once in October and twice in November, Danmarks Nationalbank converted current-account deposits into certificates of deposit because the overall current-account limit had been exceeded.[1] Since the introduction of a negative rate of interest on certificates of deposit in July 2012 and the subsequent upward adjustment of the current-account

[1] Conversion took place on 10 October, 1 November and 4 November.

limits, the banks and mortgage banks have increased their current-account deposits. This has contributed to a reduction of turnover in the uncollateralised overnight money market, cf. the article "Lower Turnover in the Danish Money Market" in this Monetary Review. Irrespective of the lower turnover, there has been a clear pass-through from the negative rate of interest on certificates of deposit to short-term money-market interest rates and hence the exchange rate of the krone. This means that monetary-policy transmission is intact.

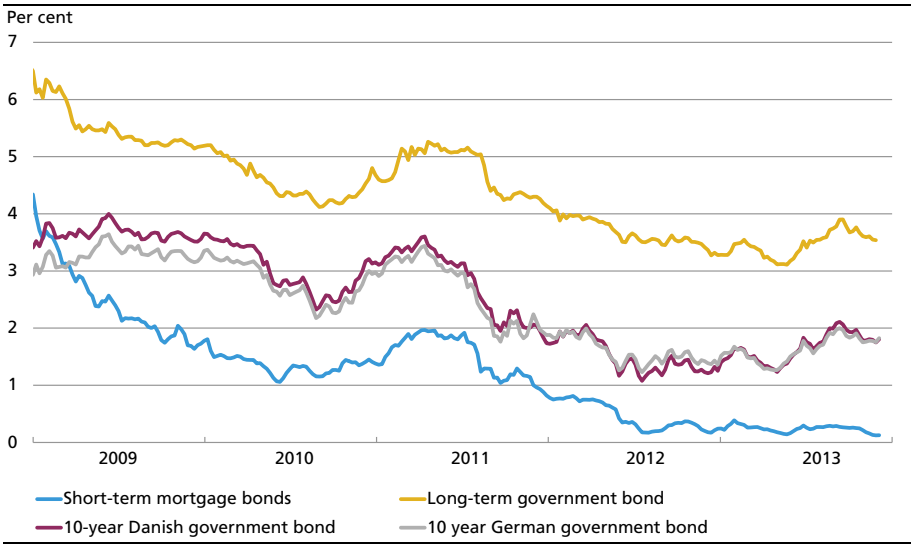
Capital market

Yields on both short-term and long-term Danish government securities have fallen since mid-September. On 28 November, an auction was held of 3- and 6-month T-bills. The sales volume in the auction totalled kr. 11.2 billion at interest rates of -0.17 and -0.13 per cent, respectively. In 2013, the strategy has been to reduce the outstanding volume of T-bills to kr. 30 billion, from kr. 45 billion at end-2012. Against this background, issuance is being adjusted so that a new 6-month T-bill will be opened every three months, which will reduce the number of series from the current three to only two. The first new 6-month T-bill is to be opened in the auction on 27 February 2014.

The yield on 10-year Danish government bonds was around 1.8 per cent in early December, down from around 2.1 per cent in mid-September, cf. Chart 15. This means that the yield is back at the level from the beginning of July. In the rest of Europe, 10-year government bond yields have also fallen, but German yields have not fallen by as much as the Danish ones. The Danish-German yield spread was just below zero in early December, after having been positive in September and early October.

Implied market-based inflation expectations, which can be derived from the difference between the yield to maturity on nominal and inflation-linked 10-year government bonds, have fallen from just under 1.6 per cent in mid-September to just over 1.4 per cent in early December. This indicates that the market expects inflation in Denmark to average around 1.4 per cent until 2023. However, the yield spread between the nominal and inflation-linked government bonds cannot be interpreted purely as expectations of inflation in Denmark, since the spread responds to temporary fluctuations in the prices of the two bonds. In addition, the yield spread may contain an inflation risk premium, typically entailing that the yield spread is higher than inflation expectations, and a liquidity premium, entailing that it is lower than inflation expectations. Market-based expectations of inflation in Germany have fallen to around 1.5 per cent.

YIELDS ON GOVERNMENT AND MORTGAGE BONDS Chart 15



Note: Weekly data. The short-term yield is the 1-year yield based on fixed bullets. The long-term yield is an average yield to maturity for 30-year fixed-rate callable bonds. The 10-year government bond yield is the par yield, i.e. the calculated yield on bonds maturing in exactly 10 years. The most recent observations are from calendar week 48 for long-term mortgage bond yields and week 49 for other yields.
Source: Nordea Analytics and Association of Danish Mortgage Banks.

At the end of November, short-term mortgage yields were around 0.15 per cent and long-term mortgage yields just under 3.6 per cent, cf. Chart 15. This means that short-term yields have fallen by approximately 0.1 percentage point since mid-September, long-term yields by approximately 0.3 percentage point.

In November and December, the mortgage banks held refinancing auctions of bonds for financing adjustable-rate loans. It was expected that the total refinancing requirement would be kr. 320 billion. This is approximately kr. 85 billion lower than in the 2012 auction, one of the reasons being that some mortgage banks have increased the annual number of auctions from three to four in 2013. Moreover, in the equivalent auctions at the end of 2012 there was a shift from very short-term bonds to 3- and 5-year bonds, which meant that fewer bonds needed to be refinanced in the November and December auctions this year. This has helped to reduce the risk that many borrowers will see their yields fixed at a high level at the same time when they refinance their adjustable-rate loans.

Danmarks Nationalbank is pleased to note that the Danish government on 28 November 2013 presented a bill on compulsory, contingent maturity extension for mortgage bonds if interest rates suddenly rise very sharply or refinancing is not possible.

The proposal means that all mortgage bonds with shorter maturities than the underlying loans will be extended if an auction fails. In addition, fixed-rate bonds for financing loans with refinancing frequencies of 1, 2 and 3 years will be extended if the rate of interest rises by more than 5 percentage points relative to the yield to maturity on equivalent bonds one year earlier. In the event of extension, the maturity of the outstanding short-term bonds will be extended by 1 year and the nominal yield will be fixed at a level corresponding to the yield to maturity on equivalent bonds one year earlier plus 5 percentage points, cf. Danmarks Nationalbank, *Financial stability,* 2nd Half 2013. If it is not possible to refinance the bonds subsequently, the maturity will be extended further. The contingent maturity extension will apply to bonds for financing new loans as well as bonds issued to refinance existing loans. The legislative amendment means that in future investors will bear the refinancing risk and part of the risk of sudden interest-rate increases. Moreover, the amendment will entail that, if a mortgage bank is wound up, mortgage bonds with shorter maturities than the underlying loans can be converted into long-term fixed-rate callable bonds with the same payment series as the underlying loans. This eliminates doubts concerning the refinancing risk in the event of winding-up.

The banks' interest rates on outstanding loans to the corporate sector fell by 0.1 percentage point from August to October, while the rate of interest on outstanding loans to households remained more or less unchanged. Deposit rates have been virtually unchanged, so the banks' interest-rate margin, measured as the spread between average lending and deposit rates, has narrowed a little for the corporate sector since August.

In October 2013, a broad political agreement, Bank Rescue Package 6, was concluded on regulation of systemically important financial institutions, SIFIs, requiring all banks and mortgage banks to hold more and better capital and increase their liquidity. This legislation is expected to come into force on 31 March 2014. The agreement sets criteria for identification of SIFIs and determines a differentiated capital requirement that depends on the banks' systemic importance. This SIFI capital requirement must be met by means of Common Equity Tier 1 capital and will be introduced gradually in the period 2015-19. The Danish Financial Supervisory Authority is expected initially to identify the SIFIs no later than at end-June 2014, and the SIFI regulation is expected to enter into force on 1 January 2015. The Danish SIFI capital requirements are intended to be in line with the requirements of comparable countries. The final level of the Danish SIFI requirements will be reviewed in 2017 at the latest, and if it is not in line with the final level of comparable

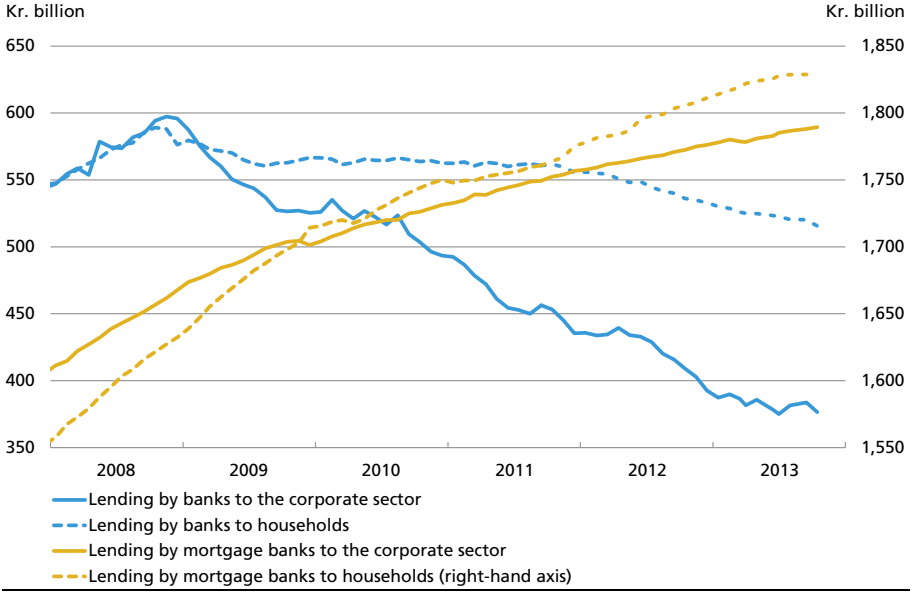
European countries, it will be adjusted. Under the agreement, the following seven financial groups are expected to be identified as SIFIs according to the criteria defined: Danske Bank, Nykredit, Nordea Bank Danmark, Jyske Bank, Sydbank, BRF Kredit and DLR Kredit, cf. Danmarks Nationalbank, *Financial stability,* 2nd Half 2013.

Credit developments

Total seasonally adjusted lending by banks and mortgage banks has been more or less unchanged at a level of around kr. 3,300 billion since end-2008. In the same period, the mortgage banks' share of total lending has risen from 64 to 73 per cent. Lending by banks to the corporate sector seems to have stabilised in recent months after having fallen since the end of 2008, cf. Chart 16. Lending by mortgage banks to households and the corporate sector rose by 0.1 and 0.7 per cent, respectively, from July to October 2013, while lending by banks to households fell by 1.3 per cent in the same period. Around 40 per cent of the fall in total bank lending since the end of 2008 is attributable to realised losses on lending, as well as the fact that most loans acquired by the Financial Stability Company have been eliminated from the lending statistics.

Firms have access to a number of other sources of funding besides loans from Danish banks and mortgage banks, including internal sources such as accumulated savings and external sources such as foreign loans

LENDING BY BANKS AND MORTGAGE BANKS — Chart 16



Note: Seasonally adjusted lending. The most recent observations are from October 2013.
Source: Danmarks Nationalbank.

and issuance of corporate bonds. In addition, individual firms may obtain funding from other firms by raising intra-group or sector loans and trade credits. Since the end of 2008, there has been an increase in the outstanding volumes of corporate bonds and of sector loans and trade credits. Moreover, corporate savings have been higher than usual during this period.

In Danmarks Nationalbank's lending survey for the 3rd quarter of 2013, the banks and mortgage banks stated that credit policies vis-à-vis both corporate and retail customers had remained virtually unchanged in the 3rd quarter. The mortgage banks stated that higher funding costs contributed to a tightening of credit policies in the 3rd quarter. Overall, the banks and mortgage banks increased their prices for both corporate and retail customers a little in the 3rd quarter. For both customer types, demand for loans continued to come mainly from new customers, and this trend is expected to continue into the 4th quarter of 2013. The banks and mortgage banks expect their overall credit standards to remain unchanged in the 4th quarter of 2013.

THE DANISH ECONOMY

GDP rose by 0.4 per cent in the 3rd quarter, adjusted for price developments and seasonal fluctuations, cf. Table 2. Both exports and total domestic demand increased. Private consumption fell by 0.1 per cent, while public consumption rose by 0.6 per cent, partly as a result of normalisation after the lockout of teachers in the 2nd quarter. Total fixed gross investment grew by 3.9 per cent, not least due to a notable increase in imports of ships.

In recent years the private sector has consolidated following the period of overheating and the subsequent downturn in the wake of the financial crisis in 2008, cf. Chart 17. This applies to both firms and households. As a result, private consumption has shown a flat trend for the last four years. Consumption accounts for around half of Denmark's GDP, so it is of paramount importance to overall demand and activity, including the strength of a new economic upswing. During the downturn, public-sector demand has helped to buoy up the economy and has to some extent made up for the stagnation in private-sector demand.

The foundation for increased private consumption is in place, and it is expected that private consumption will to a larger degree fuel GDP growth in the coming years, although the indicators are not yet clear. Uncertainty about the economy has lessened. This was reflected in rising consumer confidence during the summer, mainly because consumers take a more positive view of the Danish economy. At the same time, the

KEY ECONOMIC VARIABLES Table 2

Real growth on preceding period, per cent	2012	2013	2014	2015	2013 Q1	2013 Q2	2013 Q3
GDP	-0.4	0.4	1.5	1.6	0.0	0.6	0.4
Private consumption	-0.1	0.6	1.5	2.0	0.2	0.0	-0.1
Public consumption	0.4	0.3	1.3	0.6	-2.5	0.7	0.6
Residential investment	-8.0	-6.0	3.5	4.1	-2.8	-1.0	-3.4
Public investment	7.7	5.3	-4.4	-7.3	-3.1	6.7	7.6
Business investment	3.0	2.9	4.3	4.4	-0.5	0.5	5.7
Inventory investment[1]	-0.3	0.5	0.0	0.1	1.4	-0.6	0.6
Exports	0.4	0.7	3.0	2.8	0.2	1.7	0.9
Industrial exports	1.7	2.5	3.9	4.1	1.1	2.3	3.0
Imports	0.9	2.0	3.7	3.4	1.2	0.2	3.0
Employment, 1,000 persons	2,728	2,738	2,754	2,770	2,728	2,724	2,751
Gross unemployment, 1,000 persons	162	153	148	140	156	154	151
Net unemployment, 1,000 persons	118	117	116	111	119	117	117
Balance of payments, per cent of GDP	6.0	6.6	5.0	4.7	5.3	7.7	7.2
Government balance, per cent of GDP	-3.9	-0.4	-1.6	-2.9	-1.8	-1.1	-0.1
House prices, per cent year-on-year	-3.3	2.3	1.8	2.9	1.9	3.1	2.5
Consumer prices, per cent year-on-year	2.4	0.6	1.8	1.8	0.9	0.5	0.2
Hourly wages, per cent year-on-year	1.8	1.7	2.2	2.8	1.5	1.7	1.9

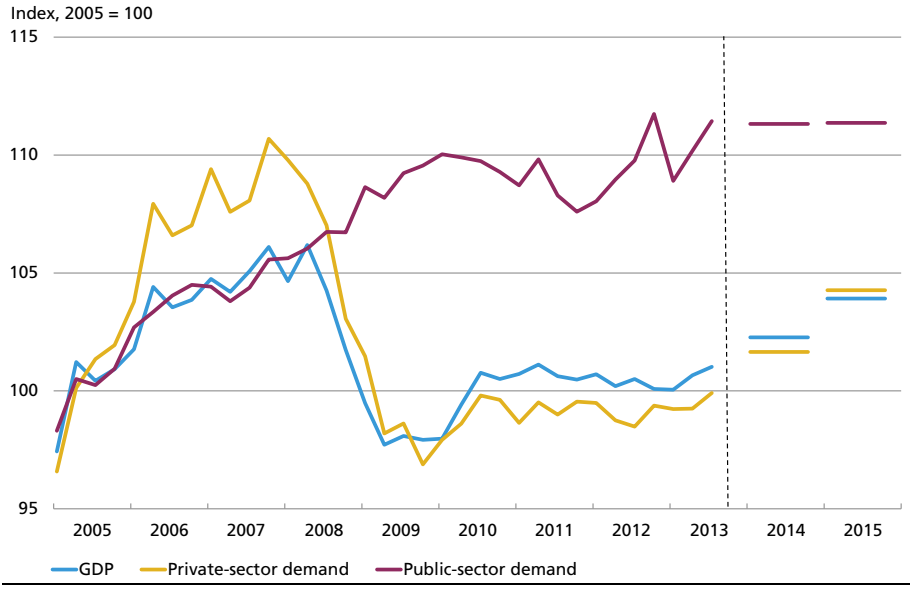
[1] Contribution to GDP growth.

housing market is beginning to pick up. In addition, there is a considerable savings surplus in the private sector, especially in firms. Finally, a historically low level of interest rates supports household disposable income, although some of the interest savings will undoubtedly be set aside to cover higher interest expenses when the level of interest rates normalises as some point.

The forecast estimates growth in private consumption at 1.5 per cent next year and 2.0 per cent in 2015. The consumption ratio, calculated as household consumption relative to disposable income before contributions to and disbursements from pension savings schemes, is currently below the historical average, but is expected to rise gradually towards 2015.

Business investment in plant and equipment, transport equipment, software, etc. increased by 6.6 per cent in the 3rd quarter, primarily as a result of large investments in imported ships. Other investments in plant and equipment rose by almost 3 per cent and are expected to rise further in the 4th quarter, which is the last chance to utilise the special

GDP AND PUBLIC- AND PRIVATE-SECTOR DEMAND Chart 17



Note: "Public-sector demand" is public consumption and investment in volumes, "private-sector demand" is private consumption and final private-sector investment in volumes, i.e. excluding inventory investment. The most recent actual figures are from the 3rd quarter of 2013. The projections for 2014 and 2015 are annual averages.
Source: Statistics Denmark and own forecast.

investment window which was introduced as part of the tax agreement from the summer of 2012 and which temporarily permits increased depreciation for tax purposes. After that, investments in plant and equipment are expected to grow in step with value added in the non-agricultural sector, so that the investment ratio will show a more or less flat trend over the forecast period. Investments are supported by the historically low level of interest rates, but spare capacity points in the opposite direction.

Non-residential construction has declined continuously since the beginning of 2012 and is low when seen in relation to e.g. value added in the private business sectors. It is estimated that the downward trend will stop next year and that moderate growth will be seen in 2015. Residential construction has shown signs of stabilising at a low level in 2013 to date and is estimated to grow slowly in the coming years.

Foreign trade was influenced by large imports of ships and falling energy exports in the 3rd quarter. Industrial exports grew considerably. The improved outlook for Denmark's largest export markets will boost exports, which are expected to rise by around 3 per cent annually in 2014 and 2015.

Overall, private-sector demand is expected to grow steadily over the next two years, while public-sector demand is assumed to grow at a

modest pace[1]. Fiscal policy is expected to have a practically neutral impact on GDP growth next year. As a result, GDP is expected to grow by 1.5 per cent in 2014 and 1.6 per cent in 2015. This means that the negative output gap will gradually narrow in the coming years, initially via a lift in productivity towards its structural level.

The forecast risks are assessed to be slightly more on the upside than previously. If the housing market remains positive and turnover continues to rise, private-sector demand may increase sooner than predicted in the forecast. The large private-sector savings could potentially provide a substantial contribution to growth if they are converted into consumption and investment. Add to this historically low interest rates and moderate unemployment. On the other hand, a new downturn abroad could delay the economic recovery in Denmark, and a rapid normalisation of the level of interest rates may also dampen growth.

The housing market

The positive development in the housing market continued over the summer. Prices have been rising since the spring of 2012, with a flattening trend in recent months. In September 2013, seasonally adjusted house prices were 2.6 per cent higher than one year earlier. In the same period, prices for flats grew by almost 8 per cent. However, there are considerable regional differences. The higher prices are to a large extent driven by a recovery in and around Copenhagen, while other parts of Denmark have not seen the same development, cf. Chart 18. Around Copenhagen, house prices were 8 per cent higher in the 2nd quarter of 2013 than one year earlier, while flats in the City of Copenhagen have risen by as much as 13 per cent over the last year.

Compared with the level before the downturn, nominal house prices are 15-20 per cent lower at the national level. The fall has been least pronounced in areas that saw the smallest price rises during the overheating in 2006-08, e.g. northern and southern Jutland.

In a long-term perspective, trading activity remains low at approximately 8,000 trades per quarter, and the supply of homes for sale is high. Since the autumn of 2012, the supply of houses for sale has been just over 40,000. Sales figures for flats are better.

A high supply and modest turnover mean that time on market remains long. Seasonally adjusted time on market for houses has been around 300 days throughout 2013, while it has been 200 days for flats. Again, there is wide regional variation. In Copenhagen, time on market is more than one third below the national average.

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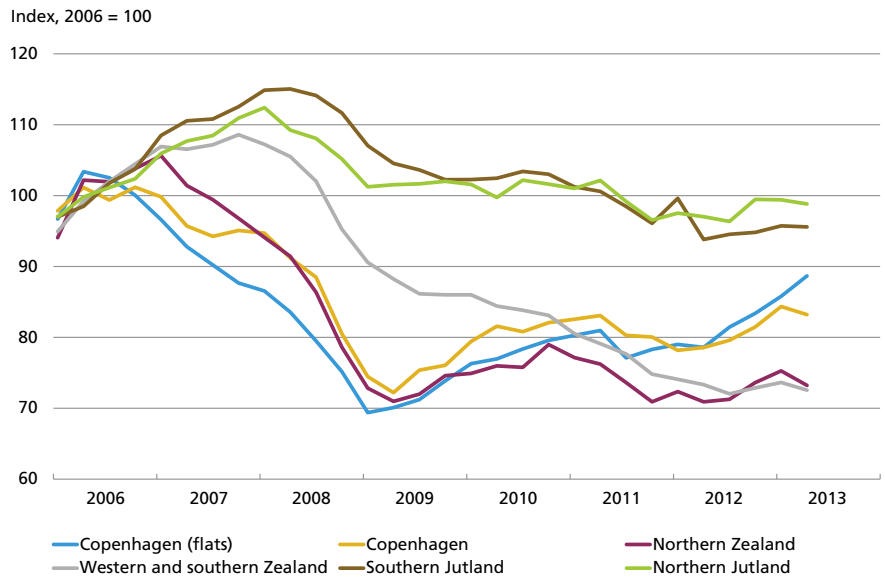
[1] The assumptions behind the forecast are described in Appendix 1.

REGIONAL HOUSE PRICES Chart 18



Note: Own seasonal adjustment. The most recent observations are from the 2nd quarter of 2013.
Source: Statistics Denmark.

At the national level, prices have been rising for some time, and in certain areas they have risen strongly. Other parts of the housing market are more vulnerable. The forecast estimates that the positive trend will continue in the coming years, with house price rises of 2-3 per cent annually at the national level. It is assumed that the price rises in urban areas will at some point rub off on the areas of Denmark where there has not been any impact yet. However, considerable regional differences will persist, one reason being the population trend, with more people migrating to the cities.

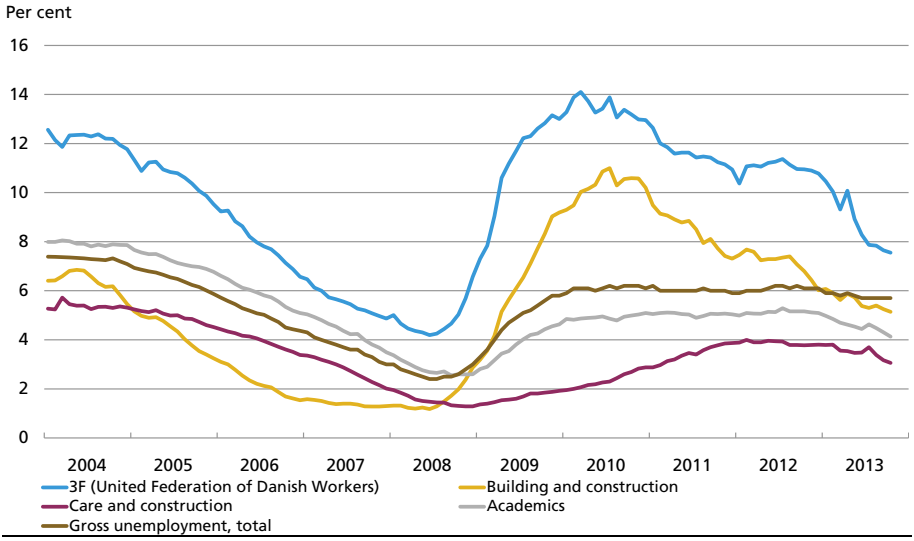
Labour market and capacity

According to the national accounts, seasonally adjusted employment rose by 26,000 from the 4th quarter of 2012 to the 3rd quarter of 2013; 20,000 of these people found jobs in the private sector. Data for the number of hours worked in the private sector is available until the 2nd quarter only and shows a flat development during this period. Employment is expected to increase a little more until the end of 2014, after which the economic recovery will boost growth.

Gross unemployment has fallen during 2013, to 5.7 per cent of the labour force in October, which is the lowest level for four years. The decline in unemployment reflects a lower number of recipients of unemployment benefits, while the number of recipients of social assist-

GROSS UNEMPLOYMENT AMONG MEMBERS OF SELECTED UNEMPLOYMENT INSURANCE FUNDS

Chart 19



Source: Statistics Denmark and Danish Labour Market Authority.

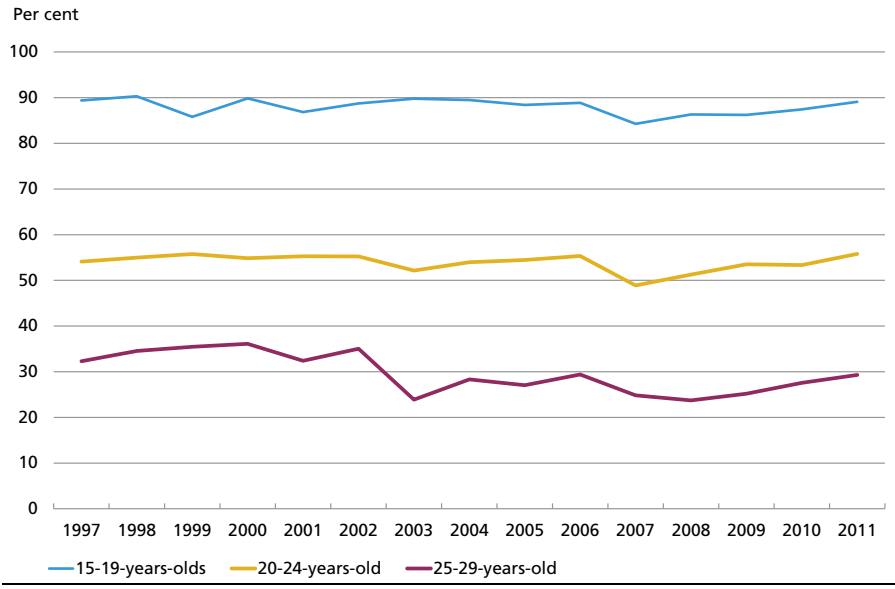
ance who are ready to enter the labour market has increased. The downward trend in unemployment is particularly strong among the unskilled and in the construction sector, cf. Chart 19. A stronger fall in overall unemployment is not expected until 2015.

There is still considerable spare capacity in the labour market. All the same, the first budding signs of a tightening of the labour market are emerging. According to the Danish Labour Market Authority's half-year analysis of recruitment in the Danish labour market, which was published in the spring, more than 9,000 firms have tried in vain to recruit new staff; this is the highest level since 2009. During 2013 there has also been a small increase in the indicators of impediments to production in the form of shortage of labour within industry, services and building and construction, but they remain at a low level.

So although some tightening of the labour market can be detected, it is estimated that there was a negative output gap of just over 2 per cent in the 3rd quarter of 2013. The output gap indicates how much actual output deviates from potential output, i.e. the output level which the economy can sustain without inflationary pressures arising. The gap will narrow towards 2015, but will not close over the forecast horizon.

In recent decades there has been a general increase in the level of education, and a higher proportion of young people now take a further education course. But for all education and training taken as one, the frequency has not risen since 1997, cf. Chart 20. During the overheating

PARTICIPATION RATES IN EDUCATION AND TRAINING Chart 20



Note: Percentage of young people who are in education or training.
Source: OECD, Education at a Glance 2013.

in 2007-08, fewer 15-29-year-olds enrolled for education or training. Subsequently, applications for places of education have risen again, and by 2011 the participation rate in education and training was more or less back at the 2006 level. Hence, the development since 2008 can be seen as a return to normal.

For young people who are not in education, the percentage classified as "others outside the labour force" in the register-based labour-force statistics has grown since 2008. This category includes, among others, stay-at-home spouses, etc. and people who have given up looking for work and who are not registered as unemployed. The extent to which these young people constitute a labour force potential that can be mobilised rapidly is uncertain. Overall, there is hardly likely to be a large reserve of young people who would be ready to enter the labour market when it tightens again in a balanced upswing.

Foreign trade and balance of payments

Adjusted for normal seasonal fluctuations, both exports and imports of goods, excluding ships and aircraft, were flat in the 1st half of 2013 in value terms. In the 3rd quarter, imports of goods rose by 2.3 per cent, while exports of goods rose by 1.0 per cent. Overall, the trade balance showed a surplus of approximately kr. 20 billion in the 3rd quarter, slightly more if energy is eliminated. Sales of energy to abroad were

lower and imports higher. Exports and imports of services have been virtually flat in 2013 so far.

In the 3rd quarter, exports of goods to Denmark's largest two markets, Germany and Sweden, grew by 12 and 8 per cent, respectively, reflecting increased sales of e.g. parts for wind turbines and oil products. On the other hand, exports to the BRIC countries[1] fell by almost 12 per cent, although sales to China were more or less unchanged. The lower sales to the other BRIC countries reflect the slowdown seen in these economies.

With a better outlook for some of Denmark's largest export markets, growth in Danish exports is expected to strengthen. Export volumes are estimated to grow by around 3 per cent annually in the next couple of years.

Over the 12-month period up to and including September 2013, the current-account surplus was kr. 120 billion, which is kr. 11 billion higher than in the preceding 12-month period. The surplus is attributable to, *inter alia*, surpluses on both the balance of goods and the balance of services. In Chart 21, net income from trade in goods and services has been adjusted by subtracting costs for bunkering from the balance of goods and adding them to the balance of trade instead. This is because costs for bunkering, which primarily cover purchase of fuel for Denmark's large merchant fleet, are registered as purchase of goods, but income from the sea freight service is registered under services. Similar effects are seen for other services, but not to the same extent. Over the last year, bunkering costs have totalled around kr. 40 billion.

The result of this adjustment is that the surplus on trade in services has hovered around a level just over zero for a long period, albeit with a rising tendency over the last year. Conversely, the surplus on trade in goods has risen since 2009, but fallen over the last year. The surplus on the investment income item has grown substantially since the mid-2000s in step with the increase in Denmark's net foreign assets, and investment income now accounts for more than half of the total current-account surplus.

Prices

Inflation, measured as the annual rate of increase in the EU Harmonised Index of Consumer Prices, HICP, was 0.3 per cent in October, up from 0.1 per cent in August 2013, cf. Table 3. Declining prices for goods, especially energy, have exerted downward pressure on the annual rate of increase in the HICP, while higher prices for services have pushed it up.

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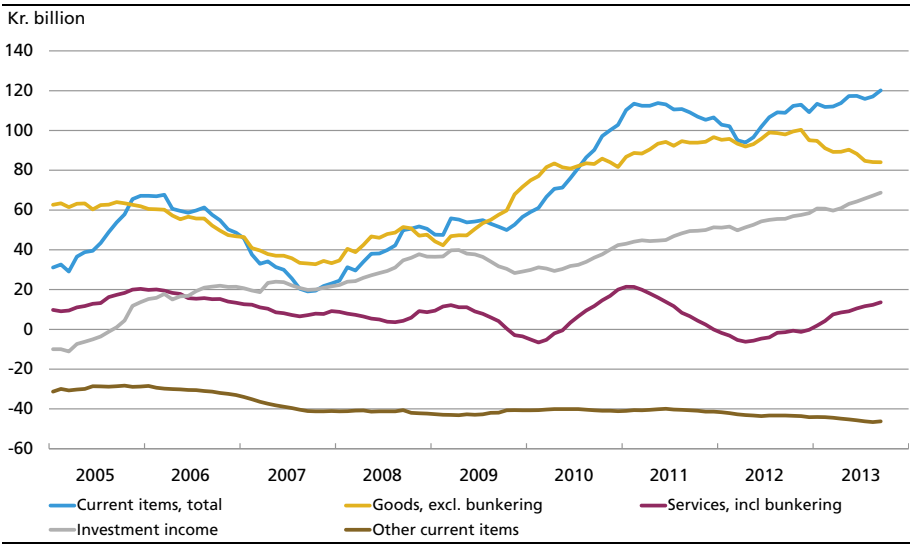
[1] The BRIC countries are Brazil, Russia, India and China.

CURRENT ACCOUNT OF BALANCE OF PAYMENTS WITH SUBCOMPONENTS Chart 21



Note: 12-month sums of net earnings. Bunkering has been subtracted from the balance of goods and added to the balance of services. "Other current items" comprise unrequited payments, EU payments and wage income. The most recent observations are from September 2013.
Source: Statistics Denmark and own calculations.

Consumer assessments of prices today compared with one year ago have fallen throughout 2013, which is in line with developments in HICP inflation. Historically there has been a relatively close relationship between consumer perceptions of price developments over the last year and consumer expectations of developments in the coming year. However, in recent months consumer expectations of price developments in

CONSUMER PRICES Table 3

Per cent, year-on-year	Weight[1]	2012	2013	2014	2015	2013/2014					
						Q3	Q4	Q1	Oct.	Nov.	Dec.
HICP		2.4	0.6	1.8	1.8	0.2	0.6	1.4	0.3	0.4	0.7
Index of net retail prices	100.0	1.9	0.9	1.9	1.8	0.7	0.9	1.4	0.8	0.9	1.1
Exogenous:											
Energy	7.9	2.9	-1.1	3.3	0.1	-2.3	-0.9	1.3	-2.3	-1.0	0.8
Food	5.1	2.4	2.4	1.9	2.2	2.1	0.8	0.7	0.6	0.8	0.8
Adm. prices ..	4.5	2.3	2.8	1.8	2.3	3.0	2.9	2.3	3.1	2.9	2.7
Rent	22.3	2.6	2.3	2.3	2.1	2.2	2.2	2.2	2.4	2.3	2.2
Excl. exogenous	60.2	1.4	0.6	1.5	1.7	0.5	0.7	1.1	0.5	0.4	0.7
Imports	19.6	1.3	-0.8	0.4	1.7	-1.3	-2.2	-1.4	-2.1	-2.3	-2.2
IMI	40.6	1.4	1.1	1.9	1.7	1.1	1.9	2.1	1.9	1.8	2.1

Note: The most recent actual figures are from October 2013.
[1] Weight in the index of net retail prices, per cent.

the coming year have risen a little. This shows that they do not expect the current very low price inflation to persist.

Core inflation, which eliminates the very volatile energy and food components, is often used as one of several measures of underlying price pressures in the economy. Danmarks Nationalbank has previously calculated core inflation as HICP excluding energy, food, alcohol and tobacco. In future, it will be calculated as HICP excluding energy and unprocessed food[1]. The new calculation of core inflation covers around 84 per cent of the goods in the consumer price index. To calculate domestic market-determined inflation, IMI, administered prices and externally determined price changes are also deducted. The IMI index makes up approximately 41 per cent of the index of net retail prices, which is the consumer price index excluding indirect taxes.

Core inflation was 0.6 per cent in October, while IMI was somewhat higher at 1.9 per cent, cf. Chart 22. This indicates that domestic price pressures are not quite as low as the modest increases in HICP and core inflation indicate. Since IMI is calculated excluding e.g. indirect taxes, it is not affected by the abolition of the fat tax and lower taxes on soft drinks and beer. Conversely, these tax reductions reduce the annual rate of increase in the HICP by 0.2 percentage point. In addition, IMI is exclusive of import prices, which have made a negative contribution to HICP and core inflation in the last year.

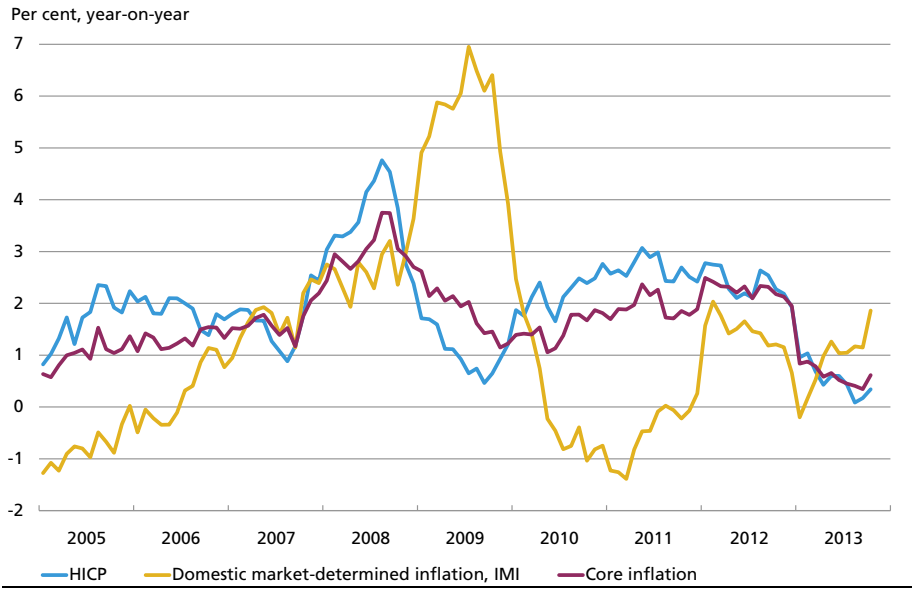
The price index for the domestic supply of goods (the wholesale price index), which illustrates price developments in the first link of the sales chain and is stated net of taxes, fell by 0.5 per cent from September to October 2013, to a level 1.7 per cent lower than one year earlier. A 3-per-cent price fall for imported goods over the last year has had a downward impact on the index. In the same period, goods produced in Denmark rose by 0.4 per cent.

Euro area HICP inflation was 0.7 per cent in October. This means that the spread between price inflation in Denmark and in the euro area narrowed to 0.4 percentage point, having fluctuated at around 1 percentage point since the beginning of the year. Most of the spread in inflation in Denmark and the euro area in October was attributable to differences in contributions from indirect taxes. The spread between core inflation rates also narrowed in October. According to preliminary data, euro area HICP inflation was 0.9 per cent in November.

In the next couple of years, domestic inflationary pressures are expected to remain moderate due to spare capacity in the economy, and

[1] Cf. Ester Hansen, Morten Hedegaard Rasmussen and Jonas Staghøj, Price formation in Denmark, Danmarks Nationalbank, *Monetary Review,* 3rd Quarter 2013, Part 2.

INFLATION Chart 22



Source: Statistics Denmark and own calculations.

HICP inflation in Denmark is estimated at 1.8 per cent in both 2014 and 2015.

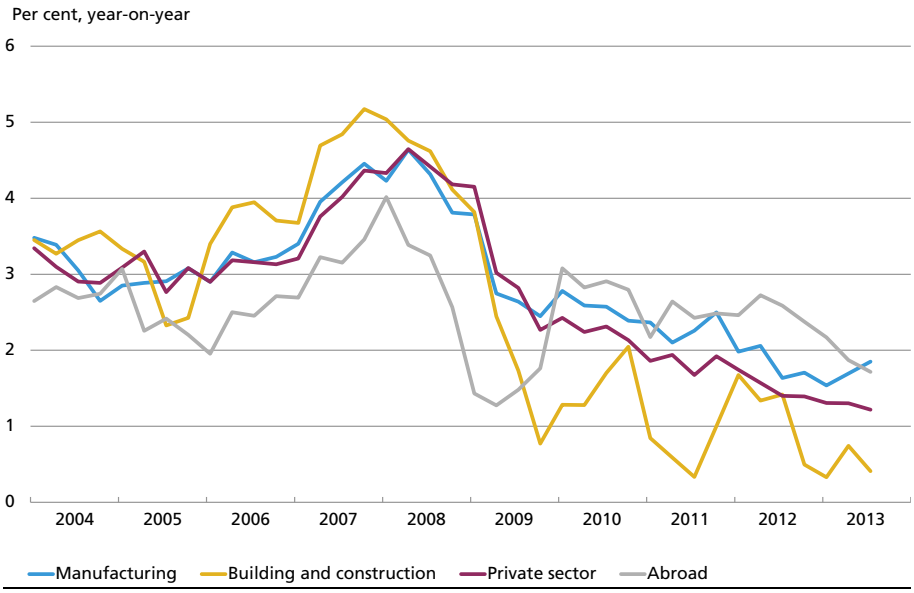
Wages

Private-sector wage inflation has been declining for the last four years, cf. Chart 23. According to Statistics Denmark's compilation, which covers the entire private-sector labour market, wages rose by 1.2 per cent in the 3rd quarter of 2013 compared with the year before. Within the export-heavy industrial sector, wage inflation was 1.8 per cent, while it was 0.4 per cent in the building and construction sector.

Wage inflation was a little higher in Denmark than in Denmark's foreign competitors in the 3rd quarter. Seasonally adjusted and weighted using the weights from the effective krone-rate index, foreign industrial wages rose by 1.7 per cent. The figure for the euro area was 1.8 per cent. Nevertheless, Danish competitiveness has improved in recent years.

Wage inflation was higher in the public than the private sector in 2012. Hence, the regulatory mechanism, which ensures a lagged parallel wage development in the public and private sectors, has reduced public-sector wage inflation markedly in 2013. In the 3rd quarter, central-government wages rose by an average of 0.9 per cent on the preceding year, while the figure for local government was 0.4 per cent. Regional wages fell by 0.9 per cent, but this figure includes nuisance bonuses for

WAGE INFLATION IN DENMARK AND ABROAD Chart 23



Note: "Abroad" is a weighted figure for wage developments in manufacturing industry among Denmark's 25 largest trading partners using the weights from the effective krone-rate index. The most recent observations are from the 3rd quarter of 2013.
Source: Statistics Denmark and own calculations.

four weeks in August, compared with five weeks in August 2012. The 2-year collective agreements from the spring mean that public-sector wage inflation is set to be moderate in the coming year too.

In the forecast, wage inflation is estimated at 2.2 per cent in 2014 and 2.8 per cent in 2015. This will improve real wages for large groups in the labour market in the coming years. Wage developments in Denmark are expected to be more or less in line with those abroad. After the turn of the year, a new collective agreement is to be negotiated for the area covered by the Danish Confederation of Trade Unions/the Confederation of Danish Employers.

Public finances

Real public consumption is expected to rise by 0.3 per cent this year and 1.3 per cent next year. That is within the limits of the new Budget Act, which enters into force in 2014 and which imposes 4-year current nominal budget ceilings on local, regional and central government. Real public investment is expected to rise by 5.3 per cent this year and fall by 4.4 per cent next year. This means that the level of public investment will remain high viewed over a longer period of time. The agreement on the 2014 Finance Act is assessed to be in line with the Finance Bill.

Overall, the impact of fiscal policy on GDP growth is expected to be more or less neutral next year.

In the first eleven months of the year, central government payments have developed more favourably than previously estimated, mainly due to a number of extraordinary revenue items. Against that background, the government deficit is estimated at kr. 7 billion this year, corresponding to 0.4 per cent of GDP, and at 1.6 per cent of GDP next year.

Thus, it looks as if Denmark will observe the recommendation from the EU to reduce its government deficit to less than 3 per cent of GDP in 2013. Compliance with the recommendation is necessary, but not sufficient, for the excessive deficit procedure to be abrogated for Denmark. In its 2014 spring forecast, the European Commission must also assess that Denmark will not exceed the reference limit of 3 per cent of GDP in 2014 and 2015. In its 2013 autumn forecast, the Commission estimated the deficit in 2013-15 at less than 3 per cent of GDP. That is in accordance with Danmarks Nationalbank's estimate of the government budget balance.

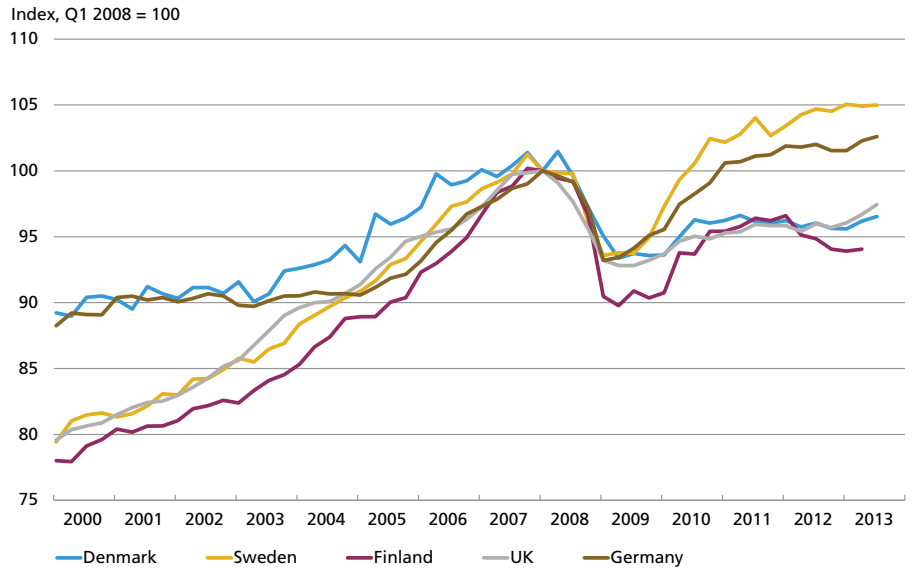
The Danish economy in an international comparison

Denmark was more severely affected by the economic downturn in the wake of the financial crisis in 2008 than many of its neighbouring countries. This was to a large extent attributable to the preceding overheating of e.g. the housing market in Denmark. Subsequently it has taken some time for growth to recover, and real GDP has been virtually unchanged since 2010. Countries such as Germany and Sweden seem to have fared better, cf. Chart 24. Next year, Statistics Denmark will start using the output-based method for determining production in the public sector, cf. Box 2. Preliminary calculations show that, viewed in isolation, this will lift real GDP in Denmark by 2.1 per cent over the period 2005-12. The other countries included in the chart already use the output-based method in their national accounts to varying degrees. While the shift to the output-based method increases real Danish GDP, nominal GDP will not be affected.

Measured by the development in GDP at current prices, the Danish economy has performed considerably better in an international comparison, cf. Chart 25. The reason is that Denmark's terms of trade have improved on an ongoing basis.

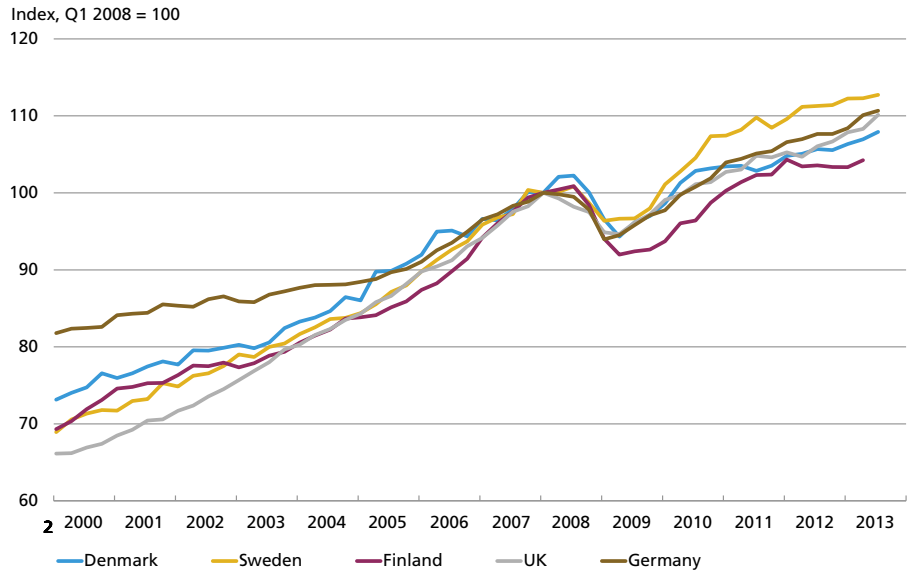
This reflects how Danish firms have been able to sell their products and services at still more favourable prices, while import prices have developed less strongly. A permanent improvement of the terms of trade boosts a country's welfare in the same way as an increase in real

DEVELOPMENT IN REAL GDP IN SELECTED COUNTRIES Chart 24



Source: Statistics Denmark and Eurostat.

DEVELOPMENT IN NOMINAL GDP IN SELECTED COUNTRIES Chart 25



Source: Statistics Denmark and Eurostat.

INCREASED PRODUCTION IN THE PUBLIC SECTOR AND GDP GROWTH Box 2

Statistics Denmark is implementing a new method, the output method, for compiling public-sector production. The new method shows higher growth in public-sector production in the period 2005-12 than the previous compilation method, the input method.

With the input method, the point of departure is the cost of public-sector production, not the value of the output. This is because public-sector production is typically not sold in a market so it does not have a price. The new method, on the other hand, uses indicators to measure the volume of public-sector production more directly, but only for individual public consumption items such as healthcare, social security, education and training and recreation and culture.

The new figures entail annual growth in public-sector production of 1.6 per cent, compared with 0.8 per cent according to the previous method. Growth in aggregate GDP increases by 2.1 percentage points over the whole period from 2005 to 2012, but the effect is strongest in 2011 and 2012. The new method also increases growth in public-sector labour productivity in the period 2005-12 by 1.3 percentage points compared with the input method. The new method will be implemented in the Danish national accounts from September 2014.

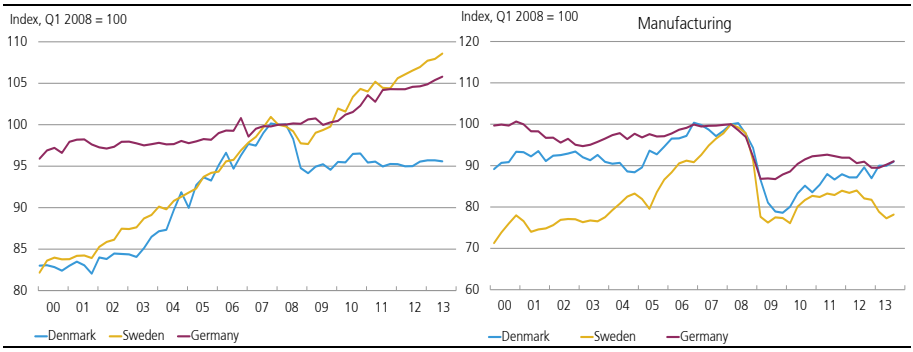
GDP. The same applies to the net return on Danish foreign investment, so that Denmark's gross national product, GNP, exceeds its GDP.

The flat development in Danish real GDP since 2010 chiefly reflects weak domestic demand. The fall in private consumption, especially building activity, after the years of overheating in 2006-08 has been greater in Denmark than in the neighbouring countries, cf. Chart 26 (left). Measured relative to GDP, building activity in Denmark now accounts for approximately 4 per cent, which is at the low end among the countries reviewed, but on a level with Germany. Conversely, the development in the export-heavy manufacturing sector has been better, cf. Chart 26 (right).

The diverging developments between countries could reflect differences in the composition of exports in terms of industries and products. Around two thirds of Danish exports of goods are industrial products. The market share of industrial exports, calculated as the development in the value of industrial exports relative to growth in the export market for industrial products, fell by approximately 15 per cent in the period 1995-2012. In the short term, there is a tendency for Danish industrial exports to gain market shares in international recessions, but lose market shares in booms. This was clearly seen in the crisis years 2008-09, when Denmark – unlike most other western European countries – increased its market share. The background was that Danish industrial exports did not shrink by as much as the market for industrial exports did.

PRIVATE CONSUMPTION (LEFT) AND INDUSTRIAL PRODUCTION (RIGHT) IN DENMARK, GERMANY AND SWEDEN

Chart 26



Note: The right-hand chart shows industrial production in volumes.
Source: OECD, *Economic Outlook*, November 2013.

The increase in Denmark's market share in 2008-09 was not attributable to a single industry or product, but was broad-based.

This does not mean that all areas have done equally well over time. If the Danish market share is broken down by subcomponents, especially the chemicals and chemical products category did well, with an unchanged market share in 1995-2012. In 2012, Denmark's exports of these products totalled kr. 105 billon, accounting for a quarter of industrial exports. Of this sum, pharmaceuticals made up kr. 50 billion. Exports to particularly the USA and the BRIC countries dominate this category and have gained still greater importance over time.

A gradual loss of market shares is not a problem to the extent that it merely reflects the arrival of new actors in the world market. For example, if the exports and imports of the BRIC countries rise by the same amount, world trade will increase, but if Denmark's trade with the rest of the world remains unchanged, Denmark's market share will decrease since the market has grown. Moreover, the lower cyclical sensitivity of Danish exports can help to dampen fluctuations in the economy in general. It reduces the pass-through from an international boom and means that an upswing in the Danish economy normally requires renewed growth in domestic demand, including private consumption.

Economic policy

The last two quarters have seen positive growth in Danish GDP, mainly driven by exports and public consumption. Private consumption has not picked up so far, but the foundation for increased private consumption is in place and has been so for some time.

House prices are rising, albeit only regionally, and the labour market is tightening in some areas. Consequently, it is important to monitor developments in the housing and labour markets closely to ensure that the expected economic upswing is sustainable and that imbalances do not build up in the economy.

In the coming years, private consumption is expected to fuel growth in GDP. Fiscal policy is as expansionary as the Budget Act and the Fiscal Compact permit and its impact on GDP growth is expected to be more or less neutral in 2014. The growth in activity means that the negative output gap will gradually narrow in the coming years.

Danmarks Nationalbank has prepared analyses of economic trends and projections for the Danish economy for several decades and in 2007 began to publish projections as part of the overall assessment of current trends in the economy, cf. the article "Danmarks Nationalbank's Projections for the Danish Economy 2008-12" in this Monetary Review. The purpose of forecasting is always to have a detailed understanding of the current state of the economy and the direction in which it is heading. So an important and regular element of Danmarks Nationalbank's forecasting of developments in the Danish economy is to decide whether there are any imbalances in the economy and what the major risks to the economy are.

The analyses of the period 2008-12 confirm previous experience, which shows that it is essential to maintain a broad perspective of the economy rather than focusing purely on the most recent, uncertain compilations of GDP growth. This emphasises the extensive problems linked to conducting active, discretionary fiscal policy and getting the timing and dosage right. Furthermore, it can be politically difficult to implement sufficient tightening measures in good times.

The need for discretionary fiscal policy is generally lower in Denmark than in many other countries as the structure of the economy includes relatively large automatic stabilisers that set in fast. Danmarks Nationalbank has pointed out that it is inexpedient to deactivate automatic stabilisers, as was done in e.g. the housing market in the years leading up to the crisis.

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 3rd quarter of 2013. 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 weak growth in global activity this year and slightly stronger growth the next few years. Euro area growth is expected to be negative this year. However, growth among Denmark's most important trading partners, including Germany and Sweden, is expected to be positive this year. Against that background, the market for Danish exports is assumed to grow by a moderate 1.5 per cent this year, after which the rate of growth will increase to 4.2 per cent in 2014 and 5.2 per cent in 2015, cf. Table 4.

Foreign prices are expected to rise this year and towards 2015, when the rate of increase is expected to decline. Export market prices will follow the same trend. Wage inflation abroad is estimated to rise only little 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. The 3-month money-market interest rate, measured by the CITA swap rate, was just under 0 per cent in early December and is expected to rise slightly towards 2015.

The average bond yield is defined as an average of the yields to maturity on outstanding government and mortgage bonds. It was 1.5 per cent at the beginning of December and is expected to rise to 2.5 per cent in 2015.

The effective krone rate has strengthened a little in recent months. In the projection, the dollar rate and the effective krone rate are assumed to remain constant at the level from early December.

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

the time of forecasting, the oil price was 112 dollars per barrel. In the projection, the oil price is assumed to develop in line with futures prices, falling to approximately 104 dollars per barrel by 2015.

Fiscal assumptions

The fiscal assumptions in the forecast are based on the planned fiscal policy, including the Finance Act for 2014, local and regional government budgets for 2014 and the government's convergence programme.

It is assumed that the option to pay tax on existing capital pension schemes at a reduced rate will yield kr. 20 billion in early tax revenue in 2014.

Real public consumption is assumed to rise by 0.3 per cent this year, cf. Table 4. Consumption growth is estimated at 1.3 per cent and 0.6 per cent in 2014 and 2015, respectively. Public investment is expected to rise by 5.3 per cent this year, but then to fall towards 2015.

OVERVIEW OF FORECAST ASSUMPTIONS — Table 4

	2012	2013	2014	2015
International economy:				
Export market growth, per cent year-on-year	1.8	1.5	4.2	5.2
Export market price[1], per cent year-on-year	0.6	3.8	3.3	1.8
Foreign price[2], per cent year-on-year	0.7	3.9	3.4	1.8
Foreign hourly wages, per cent year-on-year	2.5	2.2	2.6	2.8
Financial conditions, etc.:				
3-month money-market interest rate, per cent p.a.	0.1	0.0	-0.1	0.1
Average bond yield, per cent p.a.	1.7	1.6	1.9	2.5
Effective krone rate, 1980 = 100	100.6	102.4	103.6	103.6
Dollar exchange rate, DKK per USD	5.8	5.6	5.5	5.5
Oil price, Brent, USD per barrel	111.6	108.8	109.5	104.3
Fiscal policy:				
Public consumption, per cent year-on-year	0.4	0.3	1.3	0.6
Public investment, per cent year-on-year	7.7	5.3	-4.4	-7.3
Public-sector employment, 1,000 persons	831	828	834	838

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

APPENDIX 2: REVISIONS IN RELATION TO THE PREVIOUS FORECAST

Compared with the September forecast, the estimated growth in GDP has been adjusted upwards by 0.1 percentage point for this year and downwards by 0.1 percentage point for 2014 and 2015, to 0.4, 1.6 and 1.7 per cent, respectively, cf. Table 5, which shows a breakdown of the revisions to GDP and consumer prices by key background factors.

The higher growth estimate for this year reflects upward adjustment of GDP growth for the 1st half in the revised national accounts. Reasons for the lower growth in 2014 and 2015 include a sizeable downward adjustment of export market growth in 2013-15. The lower export market growth in the forecast period should be seen in the light of downward adjustments of several international organisations' general import growth expectations. This reflects indications of a structural break in the link between GDP and trade between countries, so that trade is now expected to rise less for a given increase in GDP. This will lead to lower exports, but also lower imports; the latter points to higher GDP, which is captured under the "other factors" item. The positive contribution under other factors also reflects that Danish exporters have made up for the lower export market growth in 2013 by gaining market shares.

The effective exchange rate of the krone has strengthened, which reduces exporters' price competitiveness and boosts imports, thereby dampening GDP growth. Higher oil prices also dampen economic growth.

Consumer price inflation (HICP) remains unchanged compared with the September forecast. A stronger exchange rate of the krone dampens the price of imported goods in 2014 and 2015, but this is offset by factors such as higher oil prices, which increase energy prices.

REVISIONS IN RELATION TO THE PREVIOUS FORECAST — Table 5

	GDP			Consumer prices, HICP		
Per cent, year-on-year	2013	2014	2015	2013	2014	2015
Forecast, September 2013	0.3	1.6	1.7	0.6	1.8	1.8
Contribution to revised estimate from:						
Export market growth	-0.2	-0.4	-0.3	0.0	0.0	-0.1
Interest rates	0.0	0.0	0.1	0.0	0.0	0.0
Exchange rates	0.0	-0.2	-0.1	0.0	-0.1	-0.1
Oil prices	0.0	0.0	-0.1	0.0	0.1	0.1
Other factors	0.3	0.4	0.3	0.0	0.1	0.1
This forecast	0.4	1.5	1.6	0.6	1.8	1.8

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

Productivity and Cost-Efficiency in the Financial Sector

Kim Abildgren and Mark Strøm Kristoffersen, Economics, Nicolai Møller Andersen, Payment Systems, and Andreas Kuchler, Statistics

INTRODUCTION AND SUMMARY

From a macro-economic point of view, an efficient financial sector is essential. Part 2 of this Monetary Review provides an analysis of productivity and cost-efficiency in the Danish financial sector, cf. Abildgren et al. (2013). This overview article presents a non-technical summary of the most important findings and conclusions of the analysis.

From 1948 to 1980, labour productivity in the financial sector, measured by the ratio of domestic lending or financial assets to employment, was roughly unchanged, while substantial productivity advances have been achieved since 1980. However, in recent years banks' (excl. mortgage banks) domestic lending relative to employment has fallen.

Compared with the rest of the EU, Denmark is among the member states with the highest total assets or domestic lending per employee in the credit institution sector. This should, however, be viewed in the context of the large Danish mortgage banking sector. In terms of the cost-to-income ratio, Danish credit institutions are in the middle of the range.

For a number of years, the average labour earnings level in the Danish financial sector has been higher than in other segments of the economy. Most of the additional labour earnings in the financial sector reflect the educational composition of employees, the complexity of job functions, geography, etc. Other factors may also provide for the relatively high earnings in the financial sector, for instance high productivity or high earnings capacity due to efficient utilisation of highly educated, specialised labour. Conversely, the ownership structure of the financial sector or the absence of strong potential foreign competition in financial services could dampen the pressure for efficient cost control and equalisation of additional earnings over time.

Comparisons with foreign studies indicate that estimated earnings differentials between the financial sector and other industries in Denmark are roughly in line with those abroad.

Since 1988, the Danish financial sector has been subject to a special payroll tax, currently accounting for 10.9 per cent of the payroll. Other things being equal, such payroll tax should contribute to relatively lower earnings in the financial sector than in other industries. Viewed in isolation, payroll tax provides an incentive for the financial sector to replace labour by, for instance, capital (e.g. through automation of labour-intensive processes).

The productivity and cost-efficiency of individual banks can be compared based on key accounting figures for input (e.g. staff costs and administrative expenses) and output (e.g. total lending). An analysis shows that some Danish banks are fully able to match the efficiency of the most efficient foreign banks. However, in terms of efficiency, some Danish banks – primarily in the Danish Financial Supervisory Authority's groups 3 and 4 – are some distance away from the most efficient Danish banks. The consolidation in the Danish banking sector in recent years has helped to improve its average efficiency.

FINANCIAL SECTOR LABOUR PRODUCTIVITY

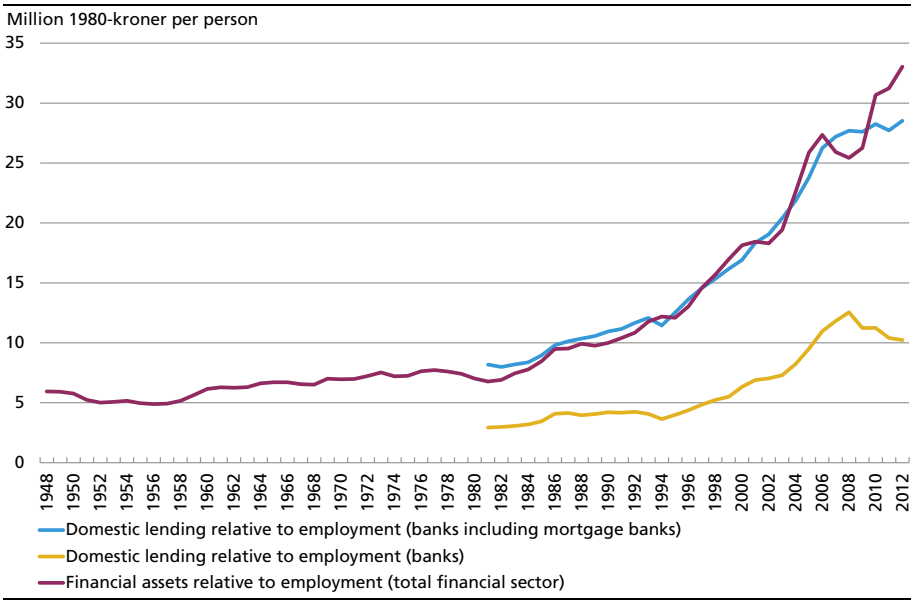
An initial, rough indicator of developments in labour productivity in the financial sector can be obtained by looking at domestic lending (or financial assets) adjusted for general price developments relative to employment, cf. Chart 1. Calculated in this way, labour productivity was more or less unchanged from 1948 to 1980, while annual growth rates have averaged some 4-5 per cent since 1980.

The post-1980 period has been characterised by increased market orientation in the financial sector following liberalisation and internationalisation. Conversely, in the pre-1980 period, quantitative credit restrictions, such as lending limits for banks and mortgage banks, foreign-exchange control, etc., were key economic policy instruments.

Lifting of restrictions on cross-border capital flows and deregulation of the financial sector in Denmark during the 1980s provided considerable welfare gains. These gains were the result of lower prices and a larger range of financial products due to increased competition and higher labour productivity in the financial sector. Moreover, the lifting of restrictions gave households and firms better opportunities for planning savings, consumption and investment.

DOMESTIC LENDING AND FINANCIAL ASSETS RELATIVE TO FINANCIAL SECTOR EMPLOYMENT

Chart 1



Note.: Deflated by the consumer price index. Financial assets comprise lending by banks (including mortgage banks), members' assets in investment associations and financial assets of insurance and pension companies.
Source: Abildgren et al. (2013).

In recent years, the ratios of domestic lending to employment for banks (including mortgage banks) have been stagnant or shown a weak trend compared with previously. This reflects that the ratio of domestic lending to employment has actually fallen in case of banks (excluding mortgage banks).

It should be noted, however, that simple measures such as financial assets or lending per employee are very summary in nature and highly incomplete indicators of productivity. For instance, under outputs, the "quality" involved is not taken into account. As a case in point, it may be debated whether lending of different credit quality should be given the same weight. For example, if the banking sector goes through a period of strong growth with lending of increasingly poor credit quality, causing systemic risks to build up in the financial sector, the lending volume per employee is not the most appropriate indicator of the efficiency of the banking system. Furthermore, these indicators are very summary in nature, based on financial sector total assets (statement holdings), which do not include e.g. the volume of financial transactions (number of payment transfers, number of securities transactions, etc.) or securities trading advice, etc.

DANISH BANKS VERSUS FOREIGN BANKS

Table 1 shows a number of summary indicators of productivity and cost-efficiency in the Danish credit institution sector compared with credit institutions in other EU 15 member states.

Disregarding countries known as international financial centres (Luxembourg and Ireland), Denmark is among the group of countries with the highest total assets per employee in the credit institution sector. The same applies to domestic lending per employee. However, the high Danish levels of total assets and domestic lending per employee should be seen in the context of high domestic savings in pension funds and a well-developed mortgage system with good opportunities for mortgage equity withdrawal.

Denmark is among the group of countries with the largest number of inhabitants per ATM. Other things being equal, a large number of inhabitants per ATM indicates less use of cash, which is cost-intensive for

INDICATORS OF CREDIT INSTITUTION PRODUCTIVITY AND COST-EFFICIENCY IN SELECTED COUNTRIES — Table 1

	Total assets per employee	Domestic lending per employee	Domestic deposits per employee	Payment transactions per employee	Cost-to-income ratio	No. of inhabitants per local branch	No. of inhabitants per ATMs
No.	Million euro	Million euro	Million euro	No. of transactions	Per cent	Persons	Persons
1.	IE: 35.4	**DK: 11.4**	NL: 8.2	FI: 107,856	ES: 48	NL: 6,784	SE: 2,773
2.	LU: 32.7	SE: 10.9	BE: 7.4	SE: 64,121	FI: 52	GB: 5,418	FI: 2,444
3.	FI: 26.5	NL: 10.1	ES: 6.5	NL: 56,589	LU: 53	SE: 5,049	NL: 2,210
4.	**DK: 25.8**	FI: 8.7	LU: 6.5	LU: 43,763	SE: 56	IE: 4,307	**DK: 2,057**
5.	NL: 24.1	IE: 7.2	GB: 6.3	FR: 43,390	PT: 58	**DK: 3,967**	IE: 1,498
6.	SE: 23.2	ES: 6.9	IE: 6.1	BE: 41,885	GR: 61	FI: 3,847	GR: 1,357
7.	GB: 21.0	IT: 6.3	FI: 5.6	GB: 40,713	GB: 61	GR: 3,111	LU: 1,193
8.	FR: 18.5	GB: 6.3	SE: 5.2	**DK: 39,345**	**DK: 63**	BE: 2,904	IT: 1,170
9.	BE: 18.1	FR: 5.5	IT: 5.0	AT: 31,340	IT: 63	LU: 2,585	FR: 1,116
10.	ES: 15.3	BE: 4.8	DE: 4.8	PT: 30,865	AT: 68	DE: 2,258	AT: 1,011
11.	IT: 13.6	PT: 4.4	FR: 4.6	DE: 27,639	FR: 69	AT: 1,893	DE: 991
12.	AT: 12.5	DE: 4.3	AT: 3.9	ES: 24,797	BE: 73	IT: 1,826	GB: 960
13.	DE: 12.5	AT: 4.2	**DK: 3.8**	IE: 21,842	DE: 73	FR: 1,703	ES: 821
14.	PT: 9.7	GR: 4.0	PT: 3.8	IT: 13,999	NL: 89	PT: 1,685	BE: 708
15.	GR: 7.7	LU: 2.5	GR: 3.1	GR: 3,255	IE: 126	ES: 1,211	PT: 635

Note: BE = Belgium, DK = Denmark, FI = Finland, FR = France, GR = Greece, NL = Netherlands, IE = Ireland, IT = Italy, LU = Luxembourg, PT = Portugal, ES = Spain, GB = United Kingdom, SE = Sweden, DE = Germany, AT = Austria. Total assets of credit institutions have been calculated as total assets at year-end 2012 in the MFI sector, excl. central banks and certificates issued by money-market funds (held by residents in the currency area). Domestic lending and deposits have been calculated at end-June 2013 and are excl. of outstanding balances with MFIs. Payment transactions relate to transactions in 2012, involving non-MFIs. As far as Denmark is concerned, payment transactions comprise credit transfers (giro, in-payment forms and credit transfers between banks – credit transfers within the same bank are not included), direct debit (Betalingsservice and Leverandørservice), cheques and card payments (Dankort and international payment cards). The cost-to-income ratio has been calculated as an average over the years 2008-2012 and based on consolidated statistics in which foreign branches and subsidiaries are included in figures.

Source: ECB and Danmarks Nationalbank.

the banking system compared with electronic payment solutions. By international standards, consumers in Denmark and the other Nordic countries make relatively few cash payments, cf. Payments Council (2013).

In terms of the ratio of total accounting costs to income or payment transactions per employee, Denmark tends to be in the middle of the range. The same more or less applies to the number of local branches. Other things being equal, a high number of inhabitants per local branch indicates that few human resources are dedicated to customer service.

In terms of payment transactions per employee, it should be mentioned, however, that a few large banks represent a substantial portion of the Danish banking sector and that credit transfers within the same bank are not included in the Danish figures, while, in principle, they are included in the figures of other countries.

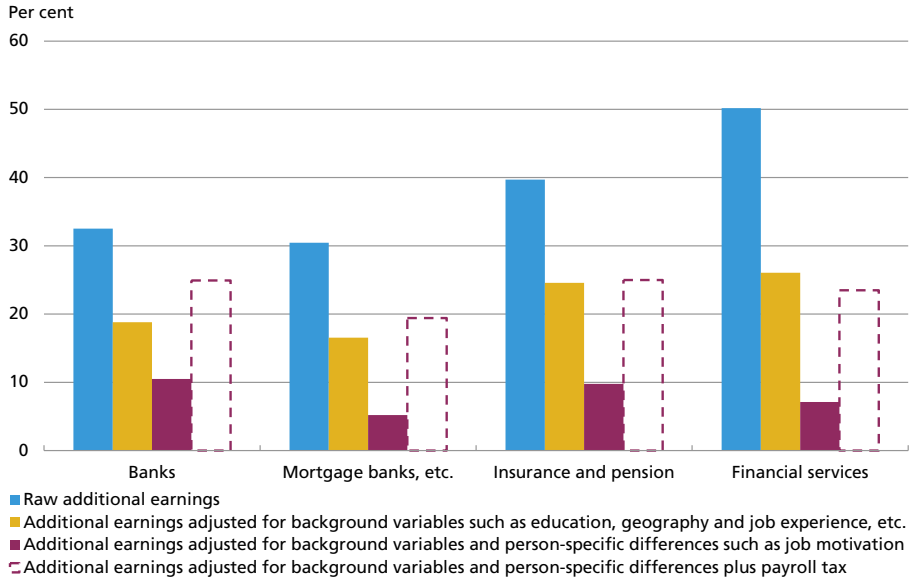
As regards the cost-to-income ratio, a high cost ratio usually provides an indication of potential savings options in a competitive market for financial services. In less competitive markets, low cost ratios are also obtainable if high prices can be charged for services that do not reflect a correspondingly high product quality, etc.

FINANCIAL SECTOR EARNINGS COSTS

Raw earnings levels show that, since the early 1980s, average earnings in the financial sector have tended to be higher than in the rest of the economy. Abildgren et al. (2013) conduct a detailed study of the earnings level in the financial sector relative to that of other industries.

This analysis shows that a substantial portion of the earnings differential can be attributed to factors such as differences in education levels, job functions, job experience and geography. For instance, a relatively high percentage of financial sector employees live in the Greater Copenhagen area, where living costs are generally higher than in the rest of the country. The analysis also indicates that part of the earnings differential is due to other person-specific differences between financial sector employees and employees in other industries, e.g. job motivation. These person-specific differences could possibly be accounted for by utilising the fact that a number of financial sector employees changed industries during the period 2000-10 – the period covered by the calculations. This provides information on whether employees who are high earners in the financial sector were also high earners working in other industries.

FINANCIAL SECTOR ADDITIONAL EARNINGS DURING THE PERIOD 2000-2010 Chart 2



Note: Estimates of raw additional earnings are derived from column 1 in Table 5.1. Additional earnings adjusted for background variables are derived from column 5 in Table 5.1, while additional earnings adjusted for background variables and unobservable differences are derived from column 2 in Table 5.2, i.e. incl. individual fixed effects. Parameter estimates, γ, have been converted to per cent as $100[exp(\gamma) - 1]$. Payroll tax has been calculated simplified based on the 2013 level, i.e. 10.9 per cent of the total payroll, shown in the chart as a percentage of earnings per hour worked for an average employee outside the financial sector. Thus the chart disregards that, to some extent, payroll tax is also paid in some industries outside the financial sector.

Source: Abildgren et al. (2013).

Allowing for these factors, the earnings level in the Danish financial sector is about 5-10 per cent higher than in other industries, cf. Chart 2.

Since 1988, the Danish financial sector[1] has been subject to a special payroll tax, currently accounting for 10.9 per cent of the payroll. Other things being equal, such payroll tax should contribute to relatively lower earnings in the financial sector than in other industries. Viewed in isolation, payroll tax provides an incentive for the financial sector to replace labour by, for instance, capital (e.g. through automation of labour-intensive processes).

It should be noted that in the calculations underlying Chart 2, only the highest completed, formal public-sector education has been included – not double education degrees or private-sector continuing education. The latter is particularly prevalent in the financial sector, cf. Danish Employers' Association for the Financial Sector (2011). An analysis con-

[1] Few other countries have similar taxes. For many years, France has had *taxe sur les salaires*, while the UK introduced a kind of payroll tax in 2010, but only on bonuses of some size.

ducted by the Danish Insurance Association (2008) shows that part of the earnings differential can be attributed to private-sector continuing education in the financial sector.

However, other factors point in the opposite direction. For instance, the hourly earnings variables used in the analysis do not include fringe benefits that are prevalent in the financial sector, such as attractive staff loans, etc.

In general, a relatively high level of earnings should be based on relatively high productivity and earnings capacity. Abildgren et al. (2013) examine the relationship between earnings and the income-to-cost ratio of Danish banks. The analysis shows that additional earnings are higher in banks with a high income-to-cost ratio. This indicates that part of the additional earnings in the banking sector is due to (unobservable) differences between banks. For example, some banks may be better than others at promoting cooperation and synergies between employees, which is reflected in a better bottom line. Ultimately, this is also to the benefit of employees through higher labour earnings.

Potential competition is important as a mechanism for ensuring that additional earnings that are not based on higher corporate earnings and productivity are ironed out over time. For a small, open economy like Denmark, potential foreign competition is particularly important. Looking at the banking sector, most foreign banks in Denmark have a parent company in another Nordic country. The explanation is that the Nordic region is relatively homogenous in terms of culture, languages, legislation, traditions and product ranges. Conversely, such "entry barriers" could make it difficult for banks from other European countries to enter the Danish market and gain a foothold in Denmark, which has also opted out of the euro. Viewed in isolation, this weakens potential competition, which is key in a highly regulated sector such as finance.

Estimated earnings differentials between the financial sector and other industries in Denmark are roughly in line with those abroad, cf. Carruth, Collier and Dickerson (2004), Björklund et al. (2007) Philippon and Reshef (2012) and Célérier and Vallée (2013). The economic literature provides a number of other explanations of why earnings levels in certain industries, e.g. the financial sector, may be higher than those of other industries for a number of years.

Some explanations could be that an industry has an ownership structure, e.g. dispersed ownership (for instance due to employee shares, shares associated with customer loyalty programmes and guarantor certificates), ownership or voting right restrictions, etc. that could dampen active ownership pressure to improve cost-efficiency, cf. Black and Strahan (2001). As a case in point, under dispersed ownership, owners may

find it difficult to coordinate their wishes for efficient cost control. In a Danish context, other examples are financial enterprises owned by associations and foundations, which may cause similar corporate governance issues in relation to cost control, cf. Andersen (1999).

It is a well-known fact that a high concentration of firms in the same industry, e.g. the IT or pharmaceutical industries, in a limited geographical area can generate positive externalities, which may lead to high corporate earnings and well-paid jobs. For instance, global financial centres such as London or New York provide the basis for offering highly specialised, private continuing education courses that are open to individual firms. Outside these centres, there is no basis for providing education offers to the same extent or of the same high quality. A high concentration of firms in the same industry also attracts highly educated, specialised labour, which cannot be utilised as efficiently – and paying the same high earnings – in less specialised firms outside the hub. A number of these factors may also apply to a regional financial hub such as Copenhagen, cf. Oxford Research (2009).

Additional earnings in the financial sector could also reflect growing demand for more specialised labour, e.g. as a result of increased focus on risk management and demand for more complex financial products and advisory services, cf. Philippon and Reshef (2012). Growing demand for specialists could have had a knock-on effect on other earnings in the financial sector.

Additional earnings may also reflect an element of "efficiency earnings", cf. Shapiro and Stiglitz (1984) and Lindbeck and Snower (1986). By paying earnings above the market level, an employer is able to attract and retain the best talents. This may be particularly important in an industry with specialised labour and a high element of job-specific competencies and may help to explain additional earnings in the financial sector, provided these factors are more prevalent in this sector than in other industries.

RELATIVE EFFICIENCY OF INDIVIDUAL BANKS

The productivity of individual banks can be compared using an "efficient frontier analysis". The mindset behind this approach is a comparison of a number of key accounting figures for individual banks' inputs (e.g. staff costs and administrative expenses) and outputs (e.g. total lending). The efficient frontier consists of banks that produce the most output with a given set of inputs, and the distance of other banks from the efficient frontier can then be measured based on a relative efficiency score.

MODELS TO ASSESS THE RELATIVE PRODUCTIVITY OF INDIVIDUAL BANKS Box 1

The two most widely used methods for efficiency analysis are Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA).

The difference between DEA and SFA is in the calculation of the efficient frontier. DEA is a linear programming technique, where the efficient frontier is constructed as linear combinations of actually observed combinations of inputs and outputs. In SFA, the efficient frontier is estimated econometrically as a function of observed combinations of inputs and outputs.

The advantage of SFA over DEA is that SFA allows that part of the variation in inputs and outputs may be due to random fluctuations or measurement errors, while DEA attributes the entire variation to differences in efficiency. The drawback, on the other hand, is that, in principle, SFA requires specification of a functional form of the production function, while DEA is based exclusively on linear combinations of data.

The models are described further in Kuchler (2013), which also contains more detailed results than the ones presented in this article.

Abildgren et al. (2013) perform an efficient frontier analysis of the accounts of all Danish banks since 2001. This analysis is based on the two most commonly used methods of efficiency analysis: Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA), cf. Box 1.

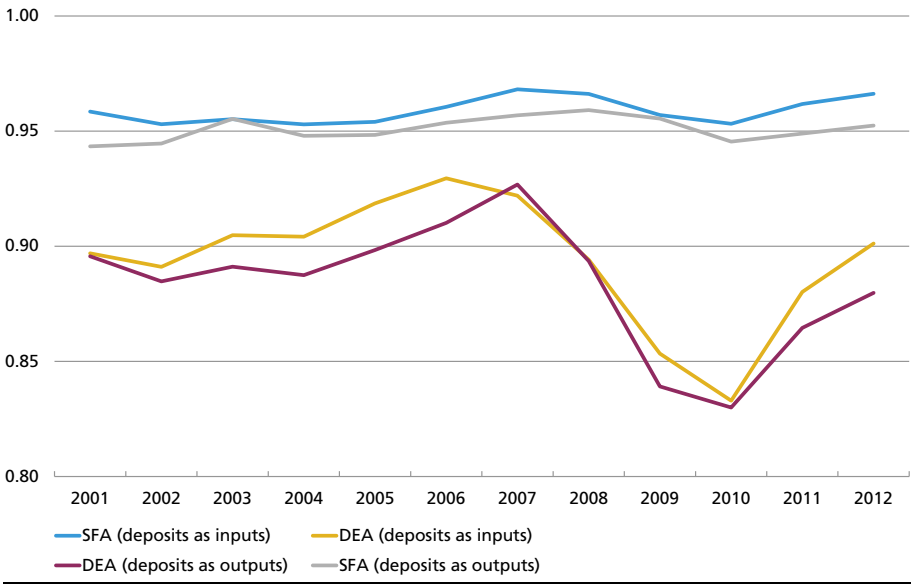
The literature does not agree on whether deposits should be considered as outputs from or inputs to the banking sector. Under the production approach, banks are seen as producers of deposit and loan accounts, using labour and capital, while, under the intermediation approach, banks are seen as financial intermediaries, providing lending based on inputs in the form of labour, capital and deposits. Therefore, calculations have been performed in which deposits are treated either as inputs or outputs. Calculations have also been conducted in which, using impairment losses, attempts have been made at taking into account the "quality of lending". The results of these calculations do not deviate substantially from those presented below.

Moreover, in the analysis of Danish banks, staff costs and administrative expenses and interest expenses are used as indicators of inputs, while interest income, fee and commission income, total lending and shares and bonds are used as indicators of outputs.

It should be emphasised that these methods are used to assess the relative efficiency of banks relative to other banks and the development in efficiency. The methods cannot be used to assess the development in the absolute efficiency of banks. In principle, the relative distance of a bank to the most efficient banks could narrow over time, and, at the same time, the most efficient banks could experience an absolute decrease in efficiency.

AVERAGE EFFICIENCY SCORE IN THE DANISH BANKING SECTOR, ESTIMATED USING DEA AND SFA

Chart 3



Note: Differences in levels and fluctuation sizes are attributable to methodological differences.
Source: Abildgren et al. (2013).

The analysis shows that the average relative efficiency score of the Danish banking sector increased in the run-up to the financial crisis, while it decreased during the crisis years of 2008-10, cf. Chart 3. The latter should be seen in the context of weaker output growth, while inputs were not adjusted to new, lower output levels at the same pace in all banks. In recent years, the average relative efficiency score has increased again, presumably reflecting that many banks are adjusting costs to the lower level of activity.

The significance of the consolidation in the sector is also evidenced in the fact that banks that either failed or were acquired by other banks in the period after 2008 were, on average, less efficient at the time of acquisition than the surviving banks. In other words, the consolidation in the sector has contributed to the increase in average efficiency seen over the last few years.

Furthermore, a supplementary analysis of banks that were acquired by the Financial Stability Company during and after the crisis shows that, in terms of efficiency, these banks did not deviate substantially from other banks before the crisis. Thus the pre-crisis increase in average efficiency was not driven by a few high-risk banks.

Although the average relative efficiency score of the sector has increased in recent years, the variation in relative efficiency across Danish

banks still exists. Thus, in terms of efficiency, some Danish banks – primarily in the Danish Financial Supervisory Authority's groups 3 and 4 – are some distance away from the most efficient Danish banks.

In order to assess the efficiency of Danish banks in an international context, Abildgren et al. (2013) performed a supplementary analysis, covering 15 large Danish banks and approximately 200 banks in the EU 15, along with Norway and Switzerland, in 2012. In light of the special Danish mortgage banking sector, this analysis was conducted at consolidated level.[1] As indicators of inputs, interest expenses and number of employees are used, while interest income, operating income, total lending, shares and bonds are used as outputs. As in the case above, calculations were performed using total deposits either as inputs or outputs.

Results of an international benchmarking analysis like this one should be seen as indicative only, since cyclical variability, differences in framework conditions and other factors beyond the control of banks may influence results. The calculations indicate that some Danish banks are fully able to match the relative efficiency score of the most efficient foreign banks. However, in terms of efficiency, some Danish banks are some distance away from the most efficient Danish and foreign banks.

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Danmarks Nationalbank's Projections for the Danish Economy 2008-12

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INTRODUCTION AND SUMMARY

Projections for the current state of and development in the Danish economy are an integral part of the economic-policy debate. The projections are produced not only by the government's economic ministries, but also by non-governmental organisations, private firms and independent institutions, including Danmarks Nationalbank.

Danmarks Nationalbank's core tasks include the planning of monetary policy in order to maintain a fixed exchange rate vis-à-vis the euro, thereby contributing as much as possible to price stability. Consequently, Danmarks Nationalbank must identify in due time whether the economic development and the planning of other economic policy entail risks in terms of price development, credit development and the stability of the financial system in order to counter such risks. Danmarks Nationalbank is dependent on always having a detailed understanding of the current state of the economy and its direction.

Hence, Danmarks Nationalbank has produced cyclical assessments and projections for the Danish economy for several decades. In 2007, Danmarks Nationalbank began to publish projections as part of its overall assessment of current economic trends published in the Monetary Review. This article reviews the experience with Danmarks Nationalbank's projections for the period covered by published forecasts, i.e. the period 2008-12.

It is important to bear in mind that the decisive success criterion for macroeconomic projections is not whether they hit the mark. They rarely do. Forecasts are more widely used by both firms and policy institutions to assess the direction and the major risks and imbalances in current economic trends. Forecasts form the basis for the strategic decisions and transactions of firms, while policy institutions use them to plan, assess and adjust economic policy on an ongoing basis. So their usefulness is ultimately determined by their positive contribution to the basis for those transactions and measures.

The period 2008-12 coincides almost exactly with the dramatic period when the global financial crisis caused a sudden recession in Denmark as well as internationally, and the following years of low growth during which the repercussions of the overheating in the mid-2000s in Denmark and economic problems in large parts of the euro area delayed a new upswing. The analysis shows that neither Danmarks Nationalbank nor other institutions which also forecast the economic development in Denmark predicted the magnitude of the crisis in 2008-09, and the subsequent stabilisation has also taken a somewhat different course than forecast.

Despite the sometimes substantial errors in growth forecasts, the cyclical assessments made it possible to identify and address a number of basic challenges and imbalances in the Danish economy during this period, including the inappropriate fiscal policy in the mid-2000s. This is apparent from a review of Danmarks Nationalbank's cyclical assessments and the resulting initiatives and recommendations. The review also stresses that it would be inexpedient to base cyclical assessments purely on the current growth in the gross domestic product, GDP, which is volatile and subject to great statistical uncertainty in the preliminary compilations. It is just as important to monitor developments in the labour market, prices and wages as well as other indicators contributing to providing an overall picture of economic trends and any imbalances. The considerable uncertainty about the assessment of the current state and direction of the economy emphasises that it is difficult to conduct active, discretionary fiscal policy and getting the timing right.

The next section provides a brief introduction to the model tool that provides the framework for Danmarks Nationalbank's forecasting activities and presents a number of more general principles concerning the use of projections in macroeconomic analysis. This is followed by a descriptive, statistical analysis of Danmarks Nationalbank's forecasts for GDP, unemployment and inflation compared with the forecasts of a number of other major institutions for 2008-12. The following section examines the primary causes of the substantial errors in the forecasts of economic developments in recent years, and, finally, Danmarks Nationalbank's cyclical assessments for the entire period are summarised, focusing on economic-policy conclusions and recommendations.

FORECASTS – BACKGROUND AND USE

Danmarks Nationalbank has published projections for the Danish economy in its Monetary Review since the 3rd quarter of 2007. At first, they were published every second time, i.e. semi-annually, but from the 3rd quarter of 2010 onwards they have been published on a quarterly basis.

However, Danmarks Nationalbank has been regularly analysing the current state of the Danish economy for much longer than that. In the 1970s, Danmarks Nationalbank already prepared quarterly national accounts, before Statistics Denmark began doing so. The purpose was two-fold: Firstly, by collecting all the available ratios, this provided an aggregate, consistent picture of the current position of the Danish economy; secondly, it provided the foundation for econometric analyses of central relations in the Danish economy in recent decades, cf. Christensen (1989).

The extensive data work thus formed the basis for Danmarks Nationalbank's macroeconomic model MONA, which was first constructed in the late 1980s and has been revised several times since then, cf. Danmarks Nationalbank (2003). As a model type, MONA corresponds to other well-known macroeconomic models in Denmark, including ADAM, which is developed and maintained by Statistics Denmark and forms the basis for the government's forecasts for the Danish economy, and SMEC, which is used in the same way by the chairmanship and the secretariat of the Economic Council (DØRS).[1]

ADAM and SMEC are annual models, while MONA is a quarterly model that focuses on capturing key short-term economic relations. These relations are described by way of equations estimated on quarterly data going back to the early 1970s.[2] The economic relations in the model thus reflect the average evolution of business cycles over the latest decades.

About forecasts based on macroeconomic models

An economic model is a tool that can be used to project how the economy will develop in future. The model can provide a suggestion of the development, depending on the estimated relations in the preceding years as well as a number of assumptions. It should be borne in mind that the relations in the model will always be simplified relative to reality as it is impossible to create a formula for all relevant aspects of the economic reality.

It is consequently up to the forecaster to determine the final design of the projection. Such an assessment includes information that is not contained in the model, e.g. 'soft' indicators of business and consumer confidence. Ultimately, all projections are, to a considerable extent, based on sound judgement. In this connection, using a macroeconomic model ensures that the many pieces of information and statistics present a consistent picture.

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1 ADAM is described in Knudsen (2012) and SMEC is described in Grinderslev and Smidt (2007).

2 While the first versions of MONA were based on the above-mentioned quarterly national accounts prepared by Danmarks Nationalbank, MONA has subsequently been based on the official quarterly national accounts for the periods and variables published by Statistics Denmark since then.

Basically, the economic variables included in MONA can be divided into two groups. One group consists of the exogenous variables determined outside the framework of the model. Based on the exogenous variables and the relations in the model, the model presents the other group of variables, i.e. the endogenous variables. When constructing the model, it should ultimately be decided how many relations the model should capture, how complex they should be, and how many conditions are included in the exogenous variables outside the model. In MONA, the majority of variables coming to us from abroad or decided politically are exogenous. They include fiscal policy, particularly public-sector demand, export market growth, interest and exchange rates and oil prices.

As mentioned above, the forecaster should determine the values of the exogenous variables in the projection period. It is often assumed that they develop more or less in line with their historical trend over a slightly longer period. Fiscal variables will typically be based on the Finance Act in force and the government's medium-term economic plans and, most recently, the related 4-year spending caps. Hence, fiscal policy reactions to movements in the economy will not be included in the projection.

At the same time, the model's equations entail a strong tendency for the economy to revert to a normal cyclical situation. Overall, this means that the projections tend to predict a calmer and more average development in the economy than what is normally the case in the real world. The uninterrupted series of events affecting the Danish economy – whether they come from abroad or occur in Denmark – is highly unpredictable and these events will, as a main rule, not be included in the projection. Accordingly, strong upswings and sharp declines in activity are both quite difficult to predict – especially if they are triggered by extraordinary factors such as the global financial crisis that began in 2007 and accelerated in 2008.

Uncertainty and risks

Danmarks Nationalbank's projection represents *the scenario that is estimated to be the most probable for the Danish economy* given the current economic policy. So while the purpose of the projection is to provide the most accurate overall picture of the current state of the economy and to identify the principal drivers of the near-term development, the specific forecast of the future development is subject to great uncertainty.

As already mentioned, there will often be substantial deviations between the projection assumptions concerning international and financial developments and actual developments, just as fiscal policy is changed in step with new economic challenges and political priorities.

More importantly, the economic and financial decisions of private agents will rarely match exactly what is implied by the model relations. This applies especially to the decisions of households to spend or save and their behaviour in the housing market; to the decisions of firms to invest, save or pay dividends to shareholders, and changes in their employment; and to wage formation trends in view of the current momentum in the labour market and labour-market reforms as well as economic policy in the broadest sense.

So according to experience, projections never hit the mark; however, that is not the decisive success criterion. An important and integral part of Danmarks Nationalbank's projection of developments in the Danish economy is to determine the major *risks* to the economic development – and thus the projection. Risks are those factors which, in the given situation, have considerable potential to decisively change the overall economic development relative to the projection assumptions. This often implies analysing general imbalances in the economy at risk of increasing further, or which may, conversely, be suddenly redressed. In other words, risks refer to factors and trends in the economy that are subject to considerable uncertainty and also have a marked impact on the current development, cf. also Box 1.

The macroeconomic model can be used to quantify the impact of major risks, whether in terms of growth patterns abroad, interest-rate trends in the financial markets, the design of next year's Finance Act or something entirely different. Danmarks Nationalbank often publishes alternative scenarios in connection with the projection in the Monetary Review, emphasising particularly uncertain conditions for the Danish economy and calculating their consequences for the projection.[1] Identification of major risks and their quantitative impact on the economic development is key to appropriate planning of economic policy.

PROJECTIONS FOR 2008-12 PRODUCED BY DANMARKS NATIONALBANK AND OTHERS

The following provides a comparison of Danmarks Nationalbank's forecasts of GDP, unemployment and inflation with those produced by other institutions (the government, DØRS, the OECD, the European Commission and the International Monetary Fund, IMF) for the period 2008-12.

[1] In recent years, the alternative scenarios have to a large extent affected the development in our export markets, which has been included in the risk scenarios in seven Monetary Reviews since 2008, most recently in the 2nd quarter of 2013. Economic policy is another factor considered, especially when new measures are being discussed; in the 2nd quarter of 2011 the effects of the retirement plan were calculated, and in the 1st quarter of 2013 the effects of the government's growth plan, Vækstplan DK, were assessed.

BASELINE SCENARIOS AND RISKS IN DANMARKS NATIONALBANK'S PROJECTIONS Box 1

Danmarks Nationalbank's projection published in its Monetary Review is to be seen as *the scenario for the Danish economy that Danmarks Nationalbank considers the most probable*. This is often called the baseline scenario.

The probability of deviations from the forecast is often considered to be almost the same in either direction at the time of forecasting. In special situations, however, the major risks to the forecast may tend to have the same effect. This is called an *asymmetrical risk scenario* and may e.g. concern a situation in which the Danish economy is overheating while tensions are building up in the international economy. In that case, several important as well as fairly uncertain factors may impact the economy negatively relative to the baseline scenario that is considered the most probable. Large adverse deviations are then more probable than the opposite.

Another form of *asymmetrical risk scenario* results from non-linear relations in the economy. A case in point is the low levels of unemployment during the overheating in the years leading up to the financial crisis when the relation between wages and unemployment could be different than seen in the 1990s and before. Another example is the impact of interest rates on housing demand or the propensity to invest; a change of 1 percentage point may have a notably different effect if the level of interest rates is 2 per cent rather than 20 per cent. This, in turn, means that if interest rates decline to 4 per cent from a level of e.g. 5 per cent, it may have a greater impact on business investment than a similar increase to 6 per cent. Hence, a symmetrical risk scenario for interest rates will skew the risk scenario for investment in the sense that the probability of notably larger investment than forecast is greater than the probability of notably smaller investment.

The three measures summarise the projection for the Danish economy. GDP summarises the assessment of economic activity, while unemployment provides an indication of the labour market. At the same time, unemployment supplements the description of economic activity and indicates wage and price formation trends, which are reflected in the rate of inflation. It is important to ensure a broad view of the projections, as this may be skewed if only one measure is used. It should be endeavoured not to focus on GDP only, since the preliminary compilations of GDP development in particular are subject to considerable statistical uncertainty.

Evaluation of macroeconomic projections often focuses on systematic imbalances and other technical issues. However, this requires a data basis consisting of at least an entire business cycle and preferably more and extending far beyond the five years during which Danmarks Nationalbank has published projections. The Ministry of Finance (2008) conducted such an analysis, cf. Box 2, which also presents results from Danmarks Nationalbank's internal projections.

The analysis also shows that over a period of almost 30 years, different forecasters have all produced average errors in the forecast of GDP of around 1 percentage point. The accuracy has only been higher in periods characterised by economic stability, as was the case in the 1990s.

We evaluate the forecasting accuracy for the following year. This shows the ability of the institutions to predict the future development before the forecasters have statistical information from the year in question. Furthermore, we compare forecasts for the same year to illustrate whether the forecasts are able to capture the trends that are revealed during the course of the year.

EVALUATION OF FORECASTS FROM 1980 TO 2006 Box 2

The most recent systematic analysis of the government's forecasting accuracy conducted by Ministry of Finance (2008) concerned the period 1980-2006. The analysis also contains a comparison with the forecasts of other institutions for the same period. Danmarks Nationalbank also produced analyses during the period mentioned, but since they have not been published, they are not included in the comparison.

In the box, the comparison is supplemented by Danmarks Nationalbank's forecasts, with similar calculations being made on the same data basis. We rely as much as possible on the template in Ministry of Finance (2008), using Danmarks Nationalbank's projections from November/December for the following year. The comparison concerns GDP growth, consumer prices, CPI, and unemployment.

Table 1 compares the accuracy of various forecasts in terms of a number of statistical measures. The average error in forecasting (known as bias or skewing) is a measure of whether forecast errors are systematically made in either direction. The accuracy (dispersion) of the forecasts is measured by the average absolute deviation or alternatively by RMSE[1], which focuses on squared deviations. Finally, the forecasts are compared with two mechanical projections, using Theil indices. In the first projection, Theil-1, the variable is assumed to mechanically follow the historical average over the last 10 years, and in the second, Theil-2, it is assumed to be unchanged relative to the most recently published value. A Theil value of less than 1 means that the forecasts are more accurate than the mechanical forecast.

Viewed over the entire period, Danmarks Nationalbank's forecasts are generally not subject to substantial bias and they are more or less in line with the forecasts made by other forecasters. Likewise, they do not differ from the other projections as regards the dispersion measures – with the exception of the inflation forecast, which seems to be comparatively accurate. Overall, there are no systematic differences in the quality of the forecasts made by the individual institutions. It is true of all the projections that they turn out well in some respects and less well in others. Conversely, it is clear for all forecasters and all variables that the forecasts are more accurate in the 1990s than in the 1980s. No doubt, this has to do with the fact that the 1990s were characterised by greater economic stability. For example, the standard deviation for GDP growth fell by just over one third. Since the millennium rollover, the accuracy of the GDP forecast declined again, while the inflation accuracy increased further.

[1] RMSE stands for Root Mean Square Error, i.e. the square root of the mean of the squared forecast errors.

CONTINUED Box 2

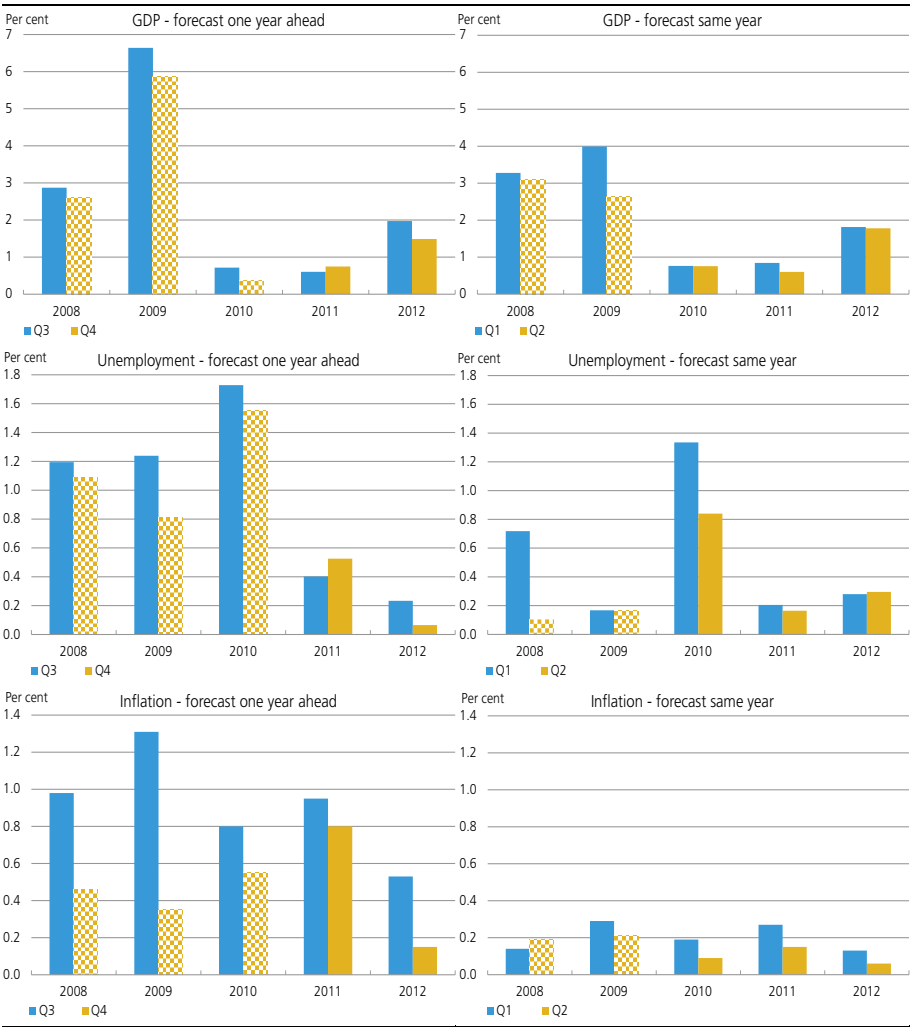
Comparison of forecasts, 1980-2006 Table 1

	DN	ØO/ØR	DØRS	DI	Nordea	EU	OECD
GDP, per cent year-on-year							
Avg. error (bias)	0.06	-0.05	0.24	0.27	0.20	-0.20	-0.01
RMSE	1.08	1.08	0.97	1.06	1.02	1.15	1.24
Avg. absolute deviation	0.86	0.85	0.76	0.86	0.75	0.90	0.97
Theil/Alternative 1	0.68	0.57	0.52	0.56	0.54	0.61	0.66
Theil/Alternative 2	0.44	0.43	0.39	0.42	0.40	0.46	0.49
Avg. absolute deviation							
1980-1989	1.13	1.08	0.74	0.91	0.91	1.17	1.33
1990-1999	0.61	0.63	0.67	0.76	0.47	0.62	0.70
2000-2006	0.82	0.85	0.94	0.94	0.82	0.62	0.86
Inflation, per cent							
Avg. error (bias)	0.07	0.10	0.23	0.33	-0.11	0.22	0.06
RMSE	0.58	0.85	1.02	0.99	0.84	0.81	1.03
Avg. absolute deviation	0.43	0.67	0.67	0.70	0.66	0.59	0.79
Theil/Alternative 1	0.22	0.33	0.39	0.38	0.32	0.31	0.40
Theil/Alternative 2	0.33	0.49	0.59	0.57	0.48	0.46	0.59
Avg. absolute deviation							
1980-1989	0.72	1.09	1.22	1.19	1.00	0.96	1.12
1990-1999	0.30	0.48	0.46	0.49	0.47	0.42	0.68
2000-2006	0.19	0.33	0.20	0.29	0.35	0.29	0.43
Unemployment rate							
Avg. error (bias)	0.03	-0.02	-0.46	0.02	-0.16	-0.10	-0.13
RMSE	0.67	0.69	0.81	0.75	0.69	0.98	0.82
Avg. absolute deviation	0.52	0.51	0.70	0.57	0.54	0.70	0.66
Theil/Alternative 1	0.31	0.26	0.30	0.28	0.26	0.37	0.31
Theil/Alternative 2	0.37	0.42	0.49	0.45	0.42	0.59	0.49
Avg. absolute deviation							
1980-1989	0.52	0.71	0.92	0.45	0.66	1.01	0.86
1990-1999	0.50	0.43	0.64	0.85	0.49	0.60	0.56
2000-2006	0.33	0.33	0.47	0.34	0.43	0.41	0.52

Source: Ministry of Finance (2008), *Economic Survey*, February 2008, and Danmarks Nationalbank.

It should be borne in mind, however, that forecasters are, all else equal, getting more information and are thus able to make better and more accurate forecasts over time. Accordingly, an autumn forecast is likely to be closer to the actual value than a forecast in a spring projection six months earlier. This trend is clearly evident in Chart 1 where the forecast error for the following year is reduced from the 3rd to the 4th quarter. Similarly, it is seen how the accuracy for the current year improves from the 1st to the 2nd quarter.

ABSOLUTE FORECAST ERROR FOR GDP, UNEMPLOYMENT AND INFLATION Chart 1



Note: The unshaded columns are based on projections published in the Monetary Reviews, while the shaded columns are based on internal projections.
Source: Statistics Denmark and Danmarks Nationalbank.

As expected, the chart also shows a clear tendency for forecasts for the current year being better than forecasts for one year ahead.

The institutions' projections are produced at different times of the year. To ensure the best possible time consistency between the compared projections, forecasts one year ahead are taken from the last projection from each institution in the preceding year. Projections from the 2nd quarter are used for forecasts of the same year. It should be noted that although it has been attempted to compare forecasts that are published at around the same time, the IMF's projections tend to be pub-

lished first.[1] In view of the above discussion of the forecast errors being reduced the later our own projection is published, the IMF's projections tend to be less well-founded than those of the other institutions.

Forecasts of economic activity (GDP)

The first challenge when assessing GDP forecasts and comparing them with the actual development is to determine which actual GDP measure is to form the basis for comparison. The GDP measures are adjusted regularly in step with revisions of the quarterly national accounts and subsequently of the annual national accounts.

Interest in the accuracy relative to the preliminary forecasts reflects that the primary purpose of the forecasts is to qualify the debate on current challenges and economic policy. This is bound to be based on the first preliminary compilations rather than the final compilations that are issued with a lag of several years. The preliminary national accounts also better reflect the data basis available to Danmarks Nationalbank and other institutions when predicting the development, thus ensuring greater comparability.

On the other hand, economic forecasts are essentially about capturing important features of the actual economic development. This indicates that the forecasts should also be compared with the best and most accurate data, i.e. the currently available national accounts figures for 2008-12.

The following provides a comparison of forecasts for the coming year with the current compilation of the national accounts for 2008-12. It shows the accuracy of prediction of the actual development at the time of planning economic policy. Forecasts for the current year, on the other hand, are compared with the first compilation of the national accounts. This reveals the institutions' ability to incorporate available statistics to provide an up-to-date picture of the economic development over the year.

Chart 2 shows how selected institutions predicted GDP growth in a given year from the beginning of the previous year to the end of the year in question. Statistics Denmark's first (full line) and current (broken line) compilations are also indicated.

The chart clearly shows that the recession in both 2008 and 2009 came as a complete surprise to the institutions. They were also taken aback by the strength of the setback right up to the end of the year concerned.

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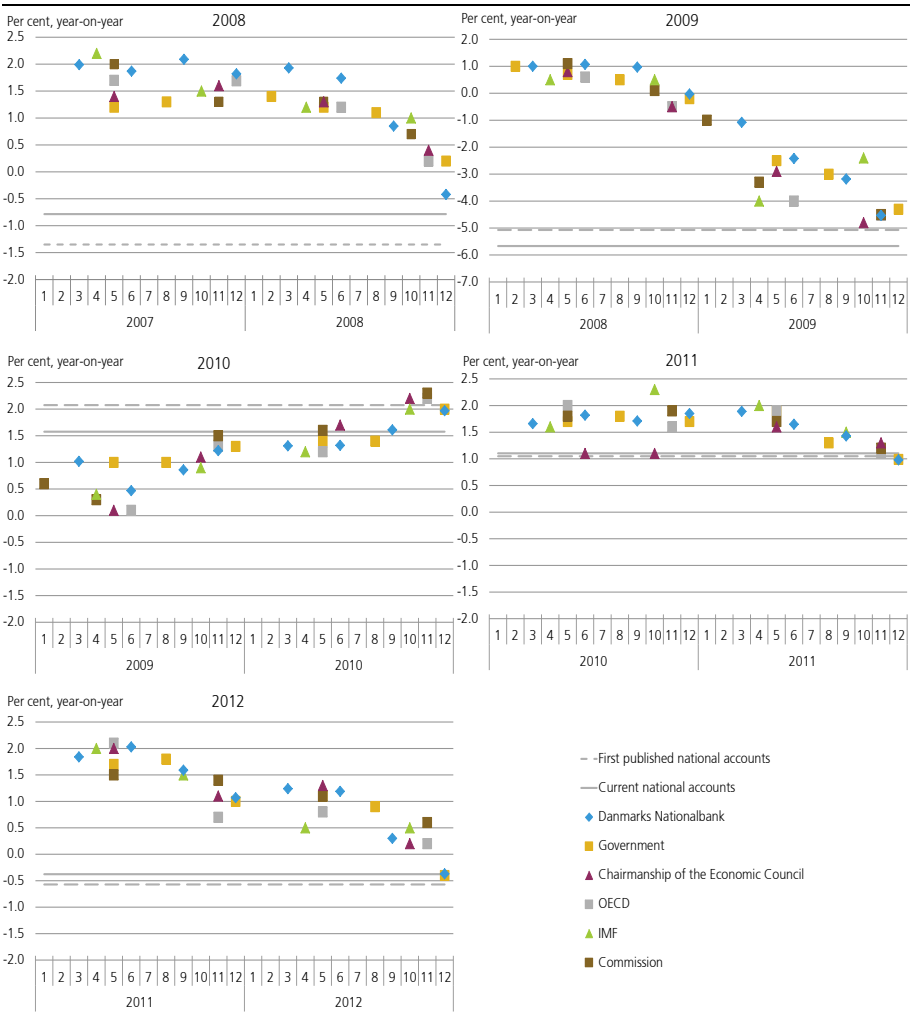
[1] The IMF's spring projection is published in April while the other institutions issue their projections in May/June. In the autumn, the IMF's projection is issued in October; DØRS, the OECD and the Commission issue their projections in October/November, and the Danish government and Danmarks Nationalbank finally publish their projections in December.

PREDICTED AND REALISED GDP GROWTH IN THE PERIOD 2008-12 Chart 2

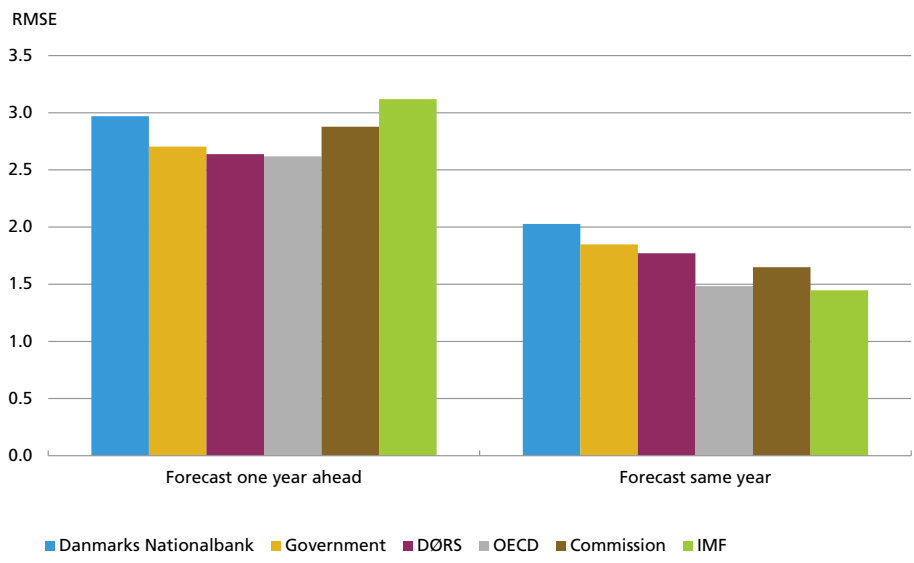


Source: Statistics Denmark, Danmarks Nationalbank, the Ministry of Finance's *Economic Survey* until May 2011 and subsequently the Ministry of Economic Affairs and the Interior's *Economic Survey* from December 2011, DØRS' semi-annual reports, the OECD's *Economic Outlook*, the European Commission's *Economic Forecasts* and the IMF's *World Economic Outlook*.

The growth forecasts in 2010 were considerably more pessimistic than the final compilation. This should be viewed in the light of the major recession in 2009, which affected the activity basis in 2010 and hence growth for 2009-10 (carry-over effects – or, in this case, carry-under effects).

In both 2011 and 2012, the institutions expected an upswing that failed to materialise to the predicted extent. This resulted in excessively high growth forecasts that were adjusted downwards over time, especially for 2012. In terms of Danmarks Nationalbank's forecast relative to

AVERAGE ERRORS IN THE FORECAST OF GDP Chart 3



Note: The forecast for year t one year ahead is the institutions' forecast in the last projection in year t-1, while the forecast for year t in the same year is from the spring projections in year t.
The forecasts for Danmarks Nationalbank are from internal projections up to and including the 2nd quarter of 2010.

Source: Statistics Denmark, Danmarks Nationalbank, the Ministry of Finance's *Economic Survey* until May 2011 and subsequently the Ministry of Economic Affairs and the Interior's *Economic Survey* from December 2011, DØRS' semi-annual reports, the OECD's *Economic Outlook*, the European Commission's *Economic Forecasts* and the IMF's *World Economic Outlook*.

those of the other institutions, it is a characteristic feature that the first forecast for 2008-09 was relatively high, and that Danmarks Nationalbank did not subsequently adjust the forecast downwards to the same extent as the other institutions.

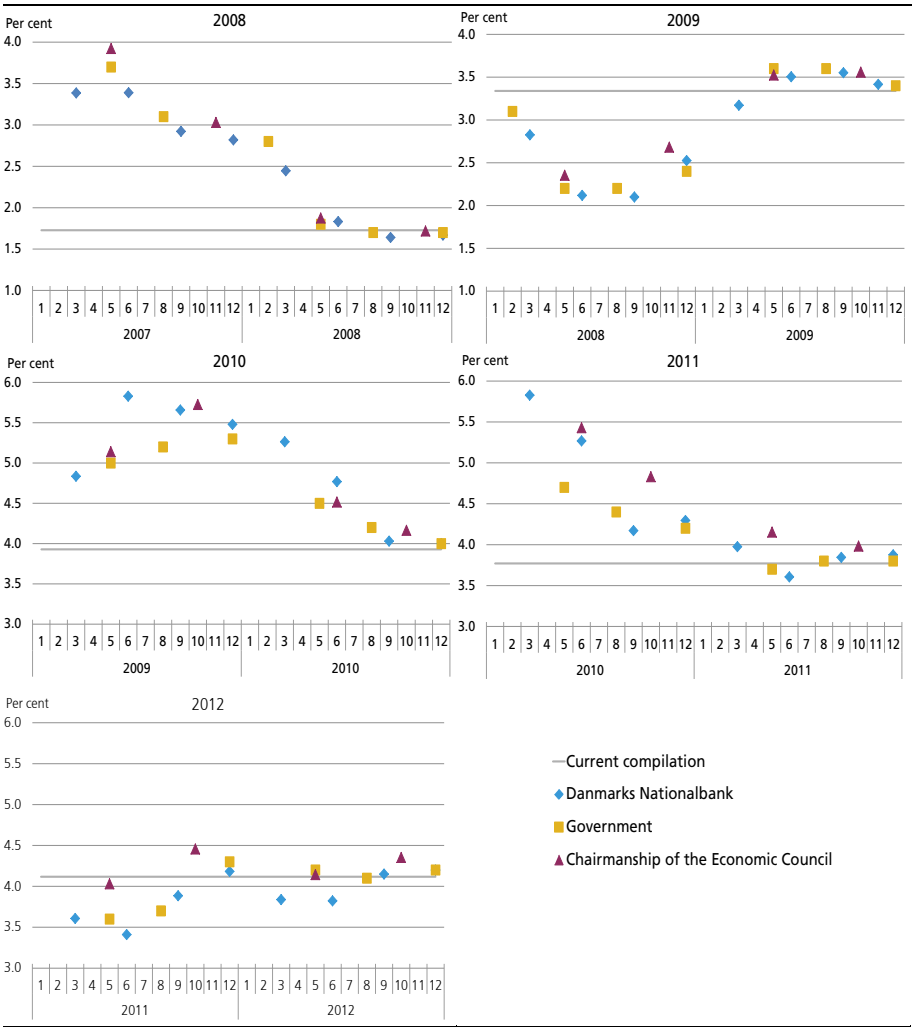
It has been attempted to summarise the overall picture for 2008-12 in Chart 3 using RMSE[1], which is an expression of the dispersion of the forecasts. Danmarks Nationalbank's forecasts of GDP growth one year ahead and in the same year are both among the comparatively inaccurate forecasts. The forecast errors can be explained mainly by the dramatic recession in 2008-09, cf. also the section below.

Unemployment forecasts

Different forecasters all use unemployment as a central forecast to describe the state of the Danish economy. The institutions do not use the

[1] RMSE stands for Root Mean Square Error, i.e. the square root of the mean of the squared forecast errors. The general reservation should be made that the RMSE calculation is based on only five observations, i.e. the years 2008-12.

PREDICTED AND REALISED NET UNEMPLOYMENT Chart 4



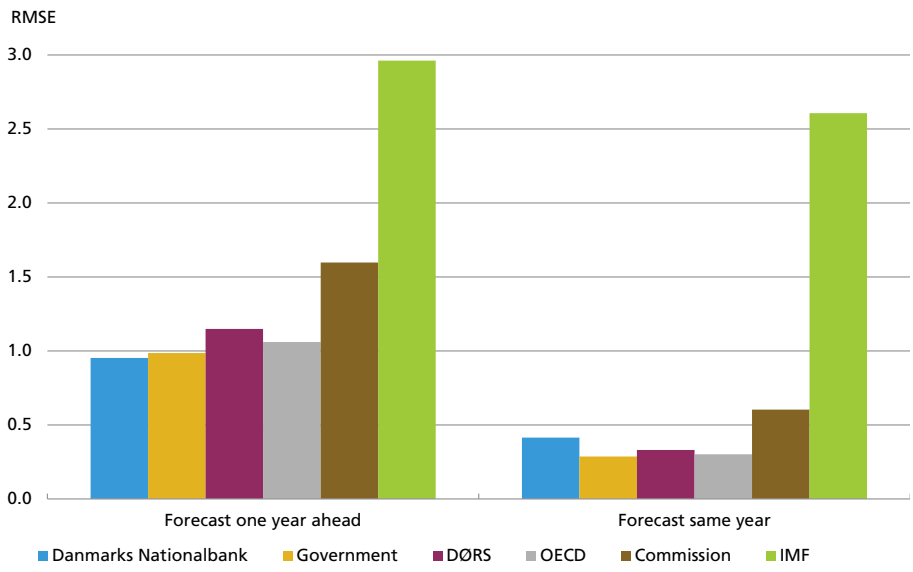
Source: Statistics Denmark, Danmarks Nationalbank, the Ministry of Finance's *Economic Survey* until May 2011 and subsequently the Ministry of Economic Affairs and the Interior's *Economic Survey* from December 2011, and DØRS' semi-annual reports.

same measure of unemployment, however.[1] So the following provides only a comparison of the Danish institutions' forecasts of the level of unemployment, cf. Chart 4, while comparing the average forecast errors for the unemployment rate from all the institutions, cf. Chart 5.

In 2008, the three Danish institutions overpredicted unemployment, which was extraordinarily low as a result of the economic boom, cf. Chart 4. Although the recession accelerated already in 2008, this was not

[1] The Danish institutions all use forecasts of net unemployment, i.e. register-based unemployment, which does not include those in activation. The OECD, the Commission and the IMF instead use a measure of unemployment based on the labour-force survey, LFS.

AVERAGE FORECAST ERRORS, UNEMPLOYMENT Chart 5



Note: The forecast for year t one year ahead is the institutions' forecast in the last projection in year t-1, while the forecast for year t in the same year is from the spring projections in year t.
Danmarks Nationalbank's forecast is from internal projections up to and including the 2nd quarter of 2010. For the Danish institutions, the forecast concerns net unemployment, while the forecasts made by the OECD, the European Commission and the IMF concern LFS unemployment.

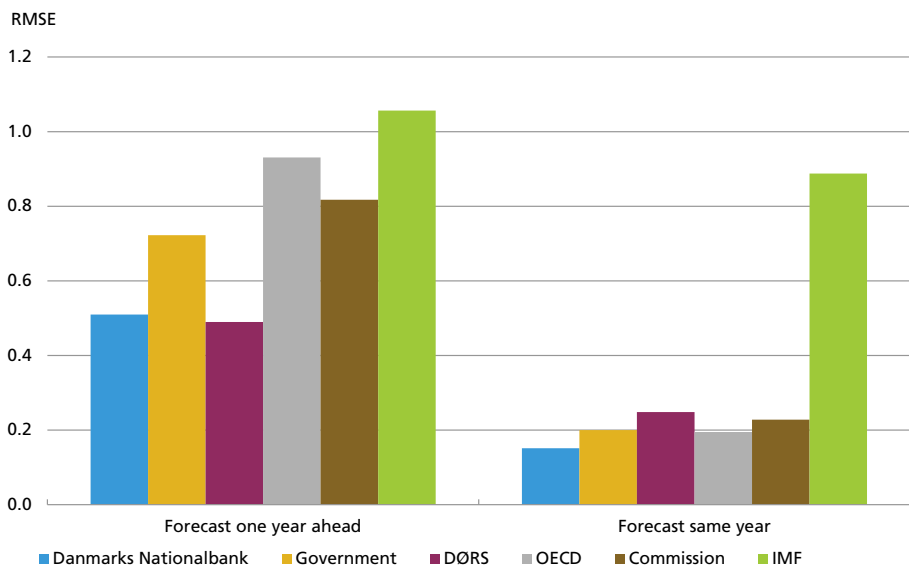
Source: Statistics Denmark, Danmarks Nationalbank, the Ministry of Finance's *Economic Survey* until May 2011 and subsequently the Ministry of Economic Affairs and the Interior's *Economic Survey* from December 2011, DØRS' semi-annual reports, the OECD's *Economic Outlook*, the European Commission's *Economic Forecasts* and the IMF's *World Economic Outlook*.

reflected in unemployment until 2009. It is normal for employment and unemployment to react to a decline in activity with a certain lag. The unemployment forecasts for 2009 reflected the underprediction of the scope of the setback. The forecasts should also be viewed in the light of the very low level of unemployment in 2008.

From 2010, unemployment stabilised at around 4 per cent. The rise in unemployment until that time was the result of more people becoming unemployed and more people experiencing longer spells of unemployment. Unemployment levels were overpredicted in the unemployment forecasts for 2010 and 2011, and the institutions were particularly slow to adjust the forecast downwards for 2010. In 2012, the forecasts were not far from the actual unemployment level.

Failing to foresee the reversal of the economy in time, the institutions made major forecast errors for 2009 and 2010, which is reflected in Chart 5. Danmarks Nationalbank's unemployment forecast for the next year is comparatively accurate. The chart also shows that the errors in the forecast of unemployment within the same year are relatively minor. Danmarks Nationalbank's forecast errors in the same year were particu-

AVERAGE FORECAST ERRORS, INFLATION RATE Chart 6



Note: The forecast for year t one year ahead is the institutions' forecast in the last projection in year t-1, while the forecast for year t in the same year is from the spring projections in year t.
The forecasts made by Danmarks Nationalbank and the Commission concern HICP, the forecasts made by the Danish government, the OECD and the IMF concern CPI, while DØRS has made forecasts for the deflator for consumer prices.

Source: Statistics Denmark, Danmarks Nationalbank, the Ministry of Finance's *Economic Survey* until May 2011 and subsequently the Ministry of Economic Affairs and the Interior's *Economic Survey* from December 2011, DØRS' semi-annual reports, the OECD's *Economic Outlook*, the European Commission's *Economic Forecasts* and the IMF's *World Economic Outlook*.

larly affected by 2010, in which year forecasts tended to be relatively too high and not adjusted downwards in time.

Inflation forecasts

Inflation increased sharply at the end of 2007 and in early 2008, driven primarily by rising energy and food prices. But the strong wage development also contributed to the increase in consumer prices. This was followed by a sudden drop in inflation, as the recession began. The declining growth in consumer prices was mainly attributable to falling energy prices. In 2010, prices rose by just over 2 per cent annually, which continued in the last two years of the period. This should be viewed in the light of rising energy and food prices as well as higher indirect taxes affecting the rise in 2010 in particular.

The institutions do not use the same price measures.[1] But the measures are characterised by displaying more or less the same level and develop-

[1] Danmarks Nationalbank uses the Harmonised Consumer Price Index, HICP, which is also used by the Commission. The government, the OECD and the IMF use the consumer price index, CPI, while DØRS publishes figures for the consumption deflator.

ment. As a result, the forecast errors for the different measures are compared, although the different concepts should be borne in mind. Characteristically, the institutions' forecast errors for inflation forecasts show a significantly greater dispersion for forecasts one year ahead than for forecasts for the same year, cf. Chart 6. Danmarks Nationalbank's forecast is comparatively accurate.

FORECAST ERRORS BROKEN DOWN INTO PRIMARY FACTORS

As described above, the economic model can be used to explain which forecast assumptions and preconditions caused the forecast to miss the mark in terms of key factors. In Table 2, the estimation errors for GDP, unemployment and inflation in the period 2008-12 are thus broken down into four different factors:

1. *International economy*, including growth in the export markets of Danish firms and foreign wage developments.
2. *Financial conditions*, including interest and exchange rates and oil prices.

ERRORS IN THE FORECAST OF KEY VARIABLES BROKEN DOWN BY PRIMARY FACTORS

Table 2

Year	2008	2009	2010	2011	2012
GDP, per cent year-on-year					
Forecast	2.1	1.0	0.9	1.7	1.6
International economy	-0.8	-4.9	2.2	0.9	-0.5
Financial conditions, etc.	-0.7	0.6	0.4	-0.8	0.4
Fiscal policy	0.0	0.2	-0.4	-0.3	0.3
Other factors	-1.4	-2.5	-1.5	-0.4	-2.2
Actual	-0.8	-5.7	1.6	1.1	-0.4
Unemployment (net), 1,000 persons					
Forecast	86	60	163	120	112
International economy	9	56	-24	-21	1
Financial conditions, etc.	9	-10	-3	8	-5
Fiscal policy	-5	-2	1	12	8
Other factors	-48	-6	-24	-12	3
Actual	51	98	114	108	118
Inflation (HICP), per cent year-on-year					
Forecast	2.4	2.6	1.4	1.7	1.9
International economy	0.0	-0.1	0.1	0.1	0.0
Financial conditions, etc.	0.3	-1.1	0.4	0.4	0.3
Fiscal policy	0.0	0.0	0.0	0.0	0.0
Other factors	0.9	-0.4	0.4	0.5	0.2
Actual	3.6	1.1	2.2	2.7	2.4

Note: The difference between the estimated and the actual scenario may not add up to the sum of the four sub-components due to rounding.
Source: Own calculations based on MONA.

3. *Fiscal policy*, including public investment and consumption.
4. *Other factors*, including, *inter alia*, other exogenous variables, data revisions and the financial transactions of the private sector in particular, i.e. Danish households and firms.

The calculation is based on the forecast for the individual years published by Danmarks Nationalbank in the preceding 3rd quarter. The selection reflects that this is the closest possible result to the statistical basis for the planning of the economic policy framework, including the Finance Act, for the year in question.

The period 2008-12 was severely affected by the global financial crisis. The development in the international economy differed considerably from the forecast development over the entire period, leading to substantial errors in the forecast of GDP growth and unemployment. The collapse in international trade at the end of 2008 and especially in the 1st quarter of 2009 led to substantial drops in activity by reducing demand for Danish exports, but also by households and firms showing greater restraint, which forms part of the negative contribution of other factors, cf. also Chart 7.[1] Thus, the large contributions to excessively high growth forecasts in 2009 can be attributed to the fact that the household consumption ratio and the corporate investment ratio for plant and equipment and buildings turned out to be lower than forecast, just as total demand led to increased inventory reduction rather than output relative to the forecast assumptions. This was contrasted by the unexpectedly sharp decline in interest rates which – viewed in isolation – contributed to higher-than-forecast activity and employment in 2009-10.

Nor was the rapid improvement in international trade in 2010-11 assumed in the forecasts for those years, which caused the positive contribution from the international factors to the errors in the forecast of GDP growth and the excessively high forecast of the scope of unemployment. In 2012, consumption showed a weaker-than-expected trend when compared with household disposable income, and demand was to some extent met via unexpected inventory reductions. These errors are included under Other factors.

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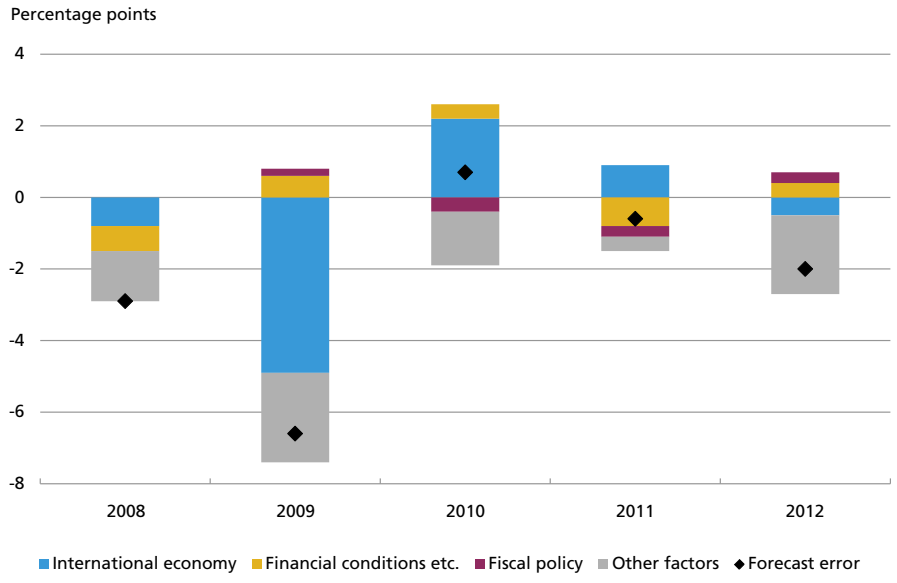
[1] A similar calculation of the impact of selected factors on the large forecast error regarding GDP growth in 2009 was presented in Spange (2010). The results therein are somewhat different from the ones presented here, on account of several factors, including that Spange (2010) was based on the projection from the 1st quarter of 2008 rather than the 3rd quarter. Moreover, the calculation in 2010 reflects the version of MONA available at the time, whereas this analysis applies the current version of MONA for every year. As a result, certain relations in the model are different from what they were when the forecasts were produced. A main result in Spange (2010) was that 2/3 of the estimation error regarding GDP growth was attributable to the much poorer export market development in 2009, where the result is 3/4 according to the calculation in this article. But if we had used the model in the 2008 version, the result would have been ½.

ERRORS IN THE FORECAST OF ANNUAL GDP GROWTH BROKEN DOWN BY PRIMARY FACTORS

Chart 7



Note: The forecast error for each year is calculated as Danmarks Nationalbank's projection in the Monetary Review, 3rd quarter of the preceding year, compared with the current compilation of GDP.
Source: Own calculations based on MONA.

Fluctuations in exchange rates and oil prices are directly passed through to inflation via the prices of imported goods and energy, and erroneous assumptions concerning those result in significantly skewed forecasts of price developments.

Deviations between estimated and actual fiscal policy also affected the errors in the estimation of growth and particularly unemployment, where deviations in public-sector employment are directly passed through.

As a result of excessively high forecasts of growth in public-sector demand, the estimated GDP growth was 0.3-0.4 percentage point too high in 2010-11. Public-sector consumption was subject to substantial uncertainty in those years in view of experience from the preceding years with major budget overruns and the escalating economic crisis. In the autumn of 2010, preliminary data for the first two quarters indicated major budget overruns, and in the 3rd quarter of 2010, Danmarks Nationalbank forecast substantially higher growth in both years, compared with the government. However, due to this particular uncertainty, Danmarks Nationalbank also compiled a risk scenario with lower public-sector consumption in 2011, which accompanied the projection in the Review. The scenario showed that GDP growth would be 0.2 percentage point lower

if public-sector consumption developed in accordance with the government's forecast. Ultimately, public-sector consumption turned out to be lower than forecast by the government.

THE OVERALL ECONOMIC SITUATION AND DANMARKS NATIONALBANK'S RECOMMENDATIONS IN 2008-12

As described above, the projections should more than anything be viewed as a tool to assess the current economic situation, and this assessment forms the basis for Danmarks Nationalbank's actions and recommendations. Hence, an overall evaluation of the projections should ultimately address how they affected Danmarks Nationalbank's assessment of developments in the economy and economic policy during the period since 2007.

A common feature of the Monetary Reviews for 2007 and into 2008 was that the Danish economy was assessed to be at the peak of a boom with strong capacity pressure and unsustainably low unemployment. On this basis, Danmarks Nationalbank repeated several times previous years' warning against continued expansionary fiscal policy that would result in further pressure on the labour market where wage inflation had increased and exceeded that of competitor countries.

During 2008 and into 2009, the conclusion was that the overheating had evolved into an economic slowdown, causing an unusually rapid rise in unemployment. At the same time, growing attention was paid to the development in banks and mortgage banks and their lending, including whether there were indications of a special credit crunch. In late 2008, Danmarks Nationalbank recommended temporary capital injections to well-managed banks to minimise the risk of a credit crunch that could exacerbate the deterioration of the economy. Such capital injections were implemented in Bank Rescue Package 2.

The government eased fiscal policy in a number of areas in 2009. Given the extraordinarily low level of interest rates, this meant that Danmarks Nationalbank was unable to recommend further easing. In this connection, Danmarks Nationalbank pointed out that the politicians had failed to tighten fiscal policy during the preceding boom. Furthermore, the recommendation was rooted in the fact that unemployment was rising from a very low initial level – far below its structural level – and that a period of low wage increases was necessary to restore Denmark's wage competitiveness. While Danmarks Nationalbank clearly underestimated the decline in activity in 2009, its labour-market expectations were more accurate – in fact, Danmarks Nationalbank overestimated unemployment in its forecasts for 2010-11.

In the 2nd half of 2009, Danmarks Nationalbank estimated that economic activity had bottomed out, but that unemployment would continue to rise. The sudden recession had put pressure on public finances, however, and there was increasing focus on government deficit and debt, including Denmark's obligations to the EU. The need for stronger mechanisms to manage public expenditure was stressed repeatedly. Danmarks Nationalbank also attached importance to the strongly increasing market focus on fiscal sustainability and credibility – the prospect of higher government debt being increasingly associated with the risk of substantial interest-rate hikes.

In the 3rd quarter of 2011, Danmarks Nationalbank presented a method to calculate cyclical gaps in the labour market and the overall economy, cf. Andersen and Rasmussen (2011), which was subsequently included in Danmarks Nationalbank's cyclical assessments. This supported the persistent focus on how to accommodate a renewed upswing by boosting the labour supply in a period when large generations will retire from the labour market.

The analyses for the period 2008-12 confirm previous experience to the effect that it is essential to maintain a broad perspective of the economy rather than focus purely on the most recent, uncertain compilations of GDP growth. This emphasises the extensive problems associated with conducting active, discretionary fiscal policy and getting the timing and dosage right. Furthermore, it can be politically difficult to implement sufficient tightening measures in good times.

The need for discretionary fiscal policy is generally lower in Denmark as the structure of the economy includes relatively large automatic stabilisers that set in fast. Danmarks Nationalbank stressed this several times in its cyclical assessments. In this connection, Danmarks Nationalbank has pointed out that it is inexpedient to deactivate automatic stabilisers, as was done in e.g. the housing market in the years leading up to the housing bubble.

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Lower Turnover in the Danish Money Market

Palle Bach Mindested, Martin Wagner Toftdahl, Banking and Markets, and Lars Risbjerg, Economics

INTRODUCTION AND SUMMARY

Activity in the money market has declined in 2013 relative to 2012, which is mainly attributable to lower turnover in uncollateralised money-market loans. This represents a continuation of the trend from the outbreak of the financial crisis in 2007-08, when focus on risks on uncollateralised interbank loans increased. A similar pattern has been observed internationally, e.g. in the euro area.

Especially the turnover in uncollateralised overnight loans has decreased. This should be viewed in the light of Danmarks Nationalbank's introduction of a negative rate of interest on certificates of deposit (CD rate) in July 2012 on account of the fixed-exchange-rate policy. The CD rate went from being higher than the current-account rate, to being lower, giving the banks (including mortgage banks) interest-rate incentive to increase their current-account deposits at Danmarks Nationalbank. At the same time, the credit institutions' access to place funds in current accounts was extended with the increase of the current-account limits. The higher current-account deposits have enhanced the credit institutions' scope for managing daily liquidity fluctuations without resorting to the money market.

Irrespective of the lower turnover in the money market, the monetary-policy transmission to the overnight interest rate remains intact. The higher current-account deposits have reduced the impact of changes in liquidity conditions on the interest-rate formation in the overnight market, compared with previously. The transmission to the overnight rate is illustrated in a simple econometric model.

The impact of monetary-policy instruments on the overnight rate is the first step in the interest-rate transmission. There has also been a clear pass-through from the negative CD rate to the slightly longer money-market rates, which determine the exchange rate of the krone. The krone has remained stable since the introduction of the negative CD rate in July 2012.

In the following, the development in money-market turnover is described, according to Danmarks Nationalbank's annual money-market survey. The interest-rate transmission from monetary-policy instruments to money-market interest rates is then analysed.

TURNOVER IN THE MONEY MARKET

In the 2nd quarter of 2013, daily turnover in money-market loans and interest-rate derivatives totalled kr. 126 billion[1], cf. Box 1, which contains a description of money-market products. Turnover in money-market loans in the Danish money market has generally declined relative to 2012. The market for uncollateralised deposits and loans accounts for the strongest drop in turnover. Turnover in interest-rate derivatives has increased, driven by higher turnover in CITA swaps.

Turnover in money-market loans

Turnover in uncollateralised deposits and lending has dropped by 40 per cent in 2013 relative to 2012, cf. Chart 1, left. This is mainly attributable to a decline in overnight loans, which nevertheless account for 77 per cent of total uncollateralised deposits and lending. The market for uncollateralised loans with longer maturities continues to be very limited, cf. Chart 2. Lending with maturities of more than one week show a daily average of kr. 15 million, or 0.2 per cent of total uncollateralised lending. This represents a continuation of the trend from the outbreak of the financial crisis in 2007-08, i.e. turnover in the uncollateralised money market has tended to decrease in Denmark, cf. Chart 1, right. The same development is seen in the euro area, cf. ECB (2013).

Part of the decline in uncollateralised overnight turnover reflects Danmarks Nationalbank's adjustment of the monetary-policy instruments in connection with the introduction of a negative CD rate in July 2012.

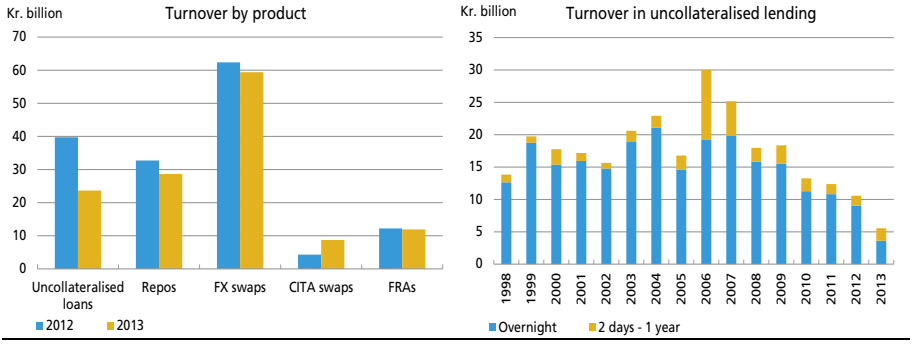
The CD rate went from being higher than the current-account rate, to being lower, giving the banks (including mortgage banks) an interest-rate incentive to place funds in current accounts, cf. Box 2, which contains a description of the monetary-policy instruments.[2] At the same time, the institutions' access to place funds in current accounts was extended with the increase of the current-account limits. The higher current-account deposits have enhanced the institutions' scope for managing daily liquidity fluctuations without resorting to the money market.

[1] The reporting population of the 2013 money-market survey consists of nine reporting banks. This article also uses statistics from T/N reporting banks' daily reports concerning turnover in the overnight money market.

[2] See Jørgensen and Risbjerg (2012) for a more detailed description of the introduction of a negative monetary-policy interest rate.

AVERAGE DAILY TURNOVER BROKEN DOWN BY PRODUCTS AND DEVELOPMENT IN UNCOLLATERALISED LOANS

Chart 1

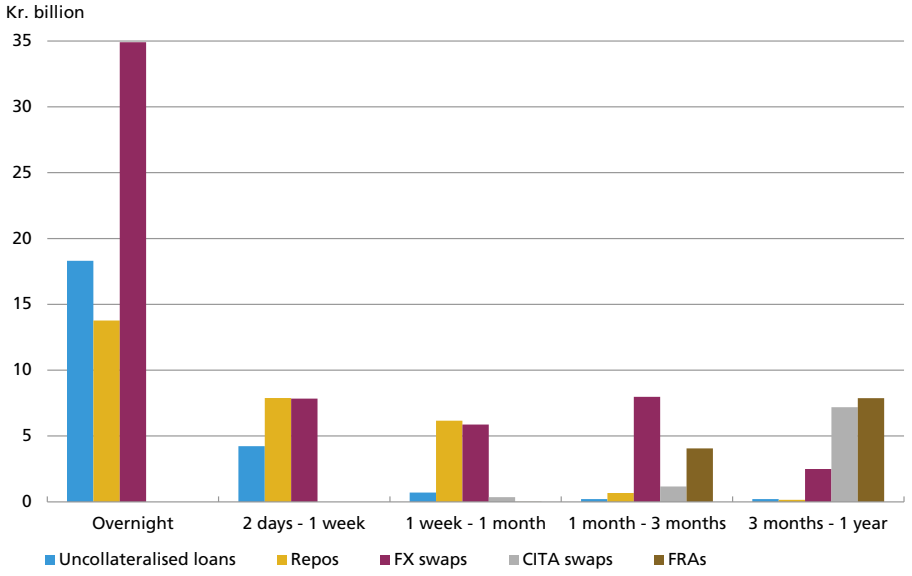


Note: Left-hand chart: Average daily turnover in the 2nd quarter of 2012 and 2013. Comprises deposits as well as lending for money-market loans. Right-hand chart: Average daily turnover in lending in April in the individual years. Turnover in total lending in 2008 and 2009 has been estimated on the basis of the T/N reporting banks' reporting as regards the overnight market and reporting of total turnover from a sample of T/N reporting banks.

Source: Danmarks Nationalbank.

AVERAGE DAILY TURNOVER IN MONEY-MARKET LOANS BROKEN DOWN BY MATURITIES AND PRODUCTS IN 2013

Chart 2



Note: Average daily turnover in the 2nd quarter of 2013. Comprises deposits as well as lending for money-market loans. The intervals cover the start of the interval and up to the end of the interval. For instance, 1 week – 1 month covers transactions with a maturity of more than 1 week up to and including 1 month.

Source: Danmarks Nationalbank.

PRODUCTS IN THE MONEY-MARKET SURVEY FOR DANISH KRONER Box 1

The money market for kroner is the interbank market up to and including 1 year for money-market loans and interest-rate derivatives.[1]

Money-market loans

Money-market loans are used to obtain or place liquidity and entail exchange of krone liquidity on the conclusion and expiry of the agreement.

Uncollateralised loans are loans in kroner without collateral with maturities from 1 day up to and including 12 months.

Repo transactions (repos or repurchase agreements) are collateralised loans in kroner with maturities ranging from 1 day up to and including 12 months. Repurchase agreements imply that on the conclusion of the agreement the seller of the bond (the recipient of the liquidity) undertakes to repurchase the securities at a future date at a price agreed on the conclusion of the agreement. The repo rate reflects the difference between the agreed purchase and sales prices.

FX swaps are collateralised loans in kroner with maturities from 1 day up to and including 12 months. In this case the collateral is provided in the form of foreign exchange. FX swaps can be seen as a simultaneous spot transaction and forward contract in foreign exchange. On the settlement of the spot transaction, for instance, kroner are exchanged for dollars while opposite payments are made on the settlement of the forward contract.

To this should be added krone-denominated bonds with a remaining maturity of up to and including 1 year, e.g. T-bills and mortgage bonds used to finance adjustable-rate loans. These are not comprised by the money-market survey.

Interest-rate derivatives

No initial exchange of liquidity takes place in connection with interest-rate derivatives. The exchange of liquidity is confined to the settlement of the interest-rate difference at a specified time in the future.

CITA swaps (Copenhagen Interest T/N Average) are short-term interest-rate swaps. A variable rate of interest (the T/N rate) is swapped for a fixed rate of interest determined at the start of the contract. On expiry of the agreement, the difference between the agreed fixed rate and the average T/N rate over the term of the agreement is settled. CITA swaps are used both for hedging interest-rate risks and for position-taking. Financial investors use CITA swaps, *inter alia*, to hedge the interest-rate risk of short-term securities such as 1-year mortgage bonds.

An *FRA (Forward Rate Agreement)* is an agreement to pay interest on a fictitious principal for an agreed future period at an agreed rate. At the beginning of the future period, an amount is settled equivalent to the difference between the agreed reference rate, e.g. CIBOR, and the agreed FRA rate on the principal. FRAs are typically entered for 3- and 6-month interest rates based on standardised contracts. If, in the future period, CIBOR exceeds the agreed FRA rate, the bank will receive an amount as compensation for the difference. However, if the interest rate is lower than the FRA rate, the bank must pay. FRAs are used both for hedging interest-rate risks and for position-taking.

[1] Cf. Mindested et al. (2012) and Danmarks Nationalbank (2009) for a more detailed description of the money market.

DANMARKS NATIONALBANK'S MONETARY-POLICY INSTRUMENTS Box 2

Monetary-policy instruments are the deposit and lending facilities made available by Danmarks Nationalbank for banks (including mortgage banks), the monetary-policy counterparties. The counterparties have access to two facilities at Danmarks Nationalbank: open-market operations and current-account deposits.

Through Danmarks Nationalbank's regular open market operations on the last banking day of each week, the counterparties can borrow against collateral and place the funds in certificates of deposits, CDs. If necessary, Danmarks Nationalbank also conducts extraordinary open market operations, in which it buys or sells CDs in order to manage the banking sector's liquidity.

Current accounts are demand accounts where the counterparties can place liquidity overnight. An overall limit has been determined for the counterparties' total current-account deposits with Danmarks Nationalbank at the close of the day. If the counterparties' current-account deposits exceed the overall limit, they will be converted into CDs.

[1] The monetary-policy instruments are described in more detail in Danmarks Nationalbank (2009).

Turnover in collateralised loans (repos and FX swaps) declined a little in 2013 relative to the 2012 survey.

FX swaps with one leg in kroner are primarily concluded with dollars as the other currency, cf. Chart 3, left. This reflects that the interbank market for FX swaps is generally dollar-based.[1] FX swaps between two currencies other than dollars are thus often executed via dollar swaps.[2]

In general, there is an overweight of foreign banks as counterparties in money-market transactions. This tendency is very clear for FX swaps, cf. Chart 3, right. One contributory factor is that foreign banks, in particular, have access to foreign exchange, e.g. dollars. The kroner that foreign banks receive via FX swaps can be placed, *inter alia*, in uncollateralised deposits in banks in Denmark. This is part of the explanation of foreign banks' large share of turnover in uncollateralised loans.

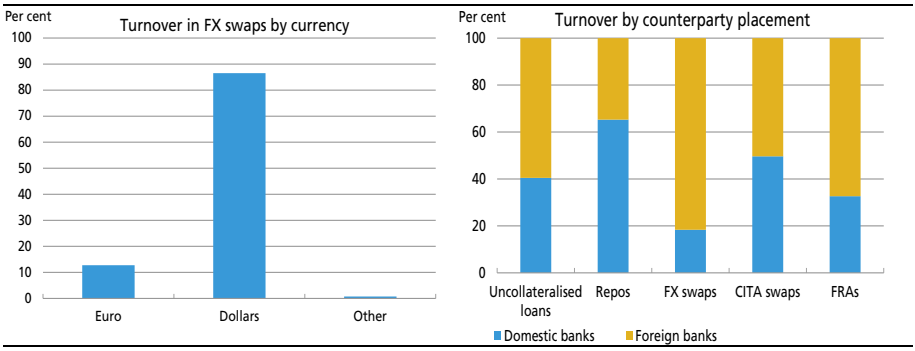
Turnover in the interest-rate derivatives market

The key interest-rate derivatives in the money market, CITA swaps and FRAs, are used by financial institutions, institutional investors and firms to hedge interest-rate risks and take positions. Maturities of more than 1 month account for the largest share of turnover, cf. Chart 2.

[1] For the first time since the annual money-market survey was introduced in 2010, it contains information on the currencies included in FX swaps with one leg in kroner. Every three years, the Bank for International Settlements, BIS, in collaboration with 53 central banks, conducts a survey of turnover in the global foreign-exchange and derivatives markets, i.e. the BIS Triennial Survey. The survey confirms that dollars were also previously included in most FX swaps. The volume of FX swaps with one leg in kroner is roughly the same in the BIS survey and the money-market survey.

[2] If, for instance, the objective is to receive pounds sterling, this can be achieved by first swapping Danish kroner for dollars and then swapping dollars for sterling. FX swaps are predominantly concluded with initial (spot) receipt of foreign exchange.

TURNOVER IN FX SWAPS BROKEN DOWN BY CURRENCIES AND TURNOVER BROKEN DOWN BY COUNTERPARTY PLACEMENT Chart 3



Note: Based on average daily turnover in the 2nd quarter of 2013. The survey concerns only transactions in which one of the currencies is Danish kroner.
Source: Danmarks Nationalbank.

FRA turnover is almost unchanged in 2013 relative to 2012, whereas turnover in CITA swaps has increased. According to market participants, one of the reasons is slightly higher uncertainty about the development in money-market rates in this period, compared with the very low level of uncertainty in 2012. Consequently, the incentive to hedge interest-rate risks and take positions has grown a little. Denmark's fixed-exchange-rate policy and a normally close relationship between interest rates in Denmark and the euro area have entailed that interest-rate risks are also to a considerable degree managed by means of the corresponding euro product, i.e. EONIA swaps.

INTEREST-RATE TRANSMISSION

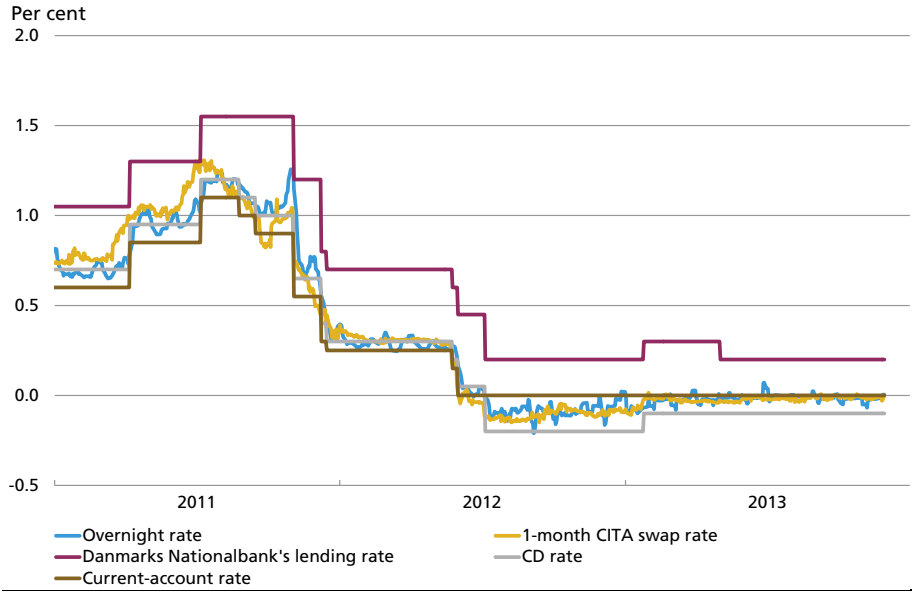
Irrespective of the lower turnover in the money market, the negative CD rate is clearly passed through to the short-term money-market rates, cf. Chart 4.

Interest-rate transmission in the overnight market

The transmission from monetary-policy rates to money-market rates is analysed further in a regression model.[1] The model explains the spread between the overnight rate and the current-account rate. The overnight rate in the model is the T/N rate, i.e. the reference rate for uncollateralised overnight loans.[2] The spread to the current-account rate has been chosen to avoid an artificially high explanatory power, which is

1 The model generally corresponds to the model in Andersen (2004).
2 T/N loans are overnight loans starting on the first banking day after the day of conclusion and expiring on the second banking day after the day of conclusion.

MONETARY-POLICY RATES AND MARKET RATES Chart 4



Note: Daily observations. The overnight interest rate is a 5-day moving average of the T/N rate.
Source: Reuters EcoWin and Danmarks Nationalbank.

solely a consequence of the general trend in overnight rate levels being determined by the current-account rate.

The spread between the T/N rate and the current-account rate is explained by the theoretical pass-through from monetary-policy rates (Interest-rate pass-through) and the spread between the CD rate and the current-account rate (Internal spread). The latter is included to describe the impact of the liquidity conditions in the money market. The possibility that the T/N rate may be affected by market perceptions of market risks (VIX) is also taken into account. The effect of the explanatory variables is permitted to be different before and after the introduction of a negative CD rate by using a dummy variable (D), assuming the value of 1 on days from the introduction of the negative CD rate, and zero before. The estimated model can be summarised in the following equation, which is estimated on daily data: [1]

[1] In order to take autocorrelation and heteoscedasticity into account in the residuals, Newey-West standard errors are used. The data period runs from 2 July 2007 to 30 August 2013. The estimation starts in the 2nd half of 2007, since the maturity of certificates of deposit was changed from 14 to 7 days in May 2007. The 14-day maturity meant that expectations of ECB interest-rate adjustments could have a strong effect on the T/N rate, cf. Danmarks Nationalbank (2007). (-1) denotes that the value from the previous day is included.

(1) T/N rate – current-account rate =

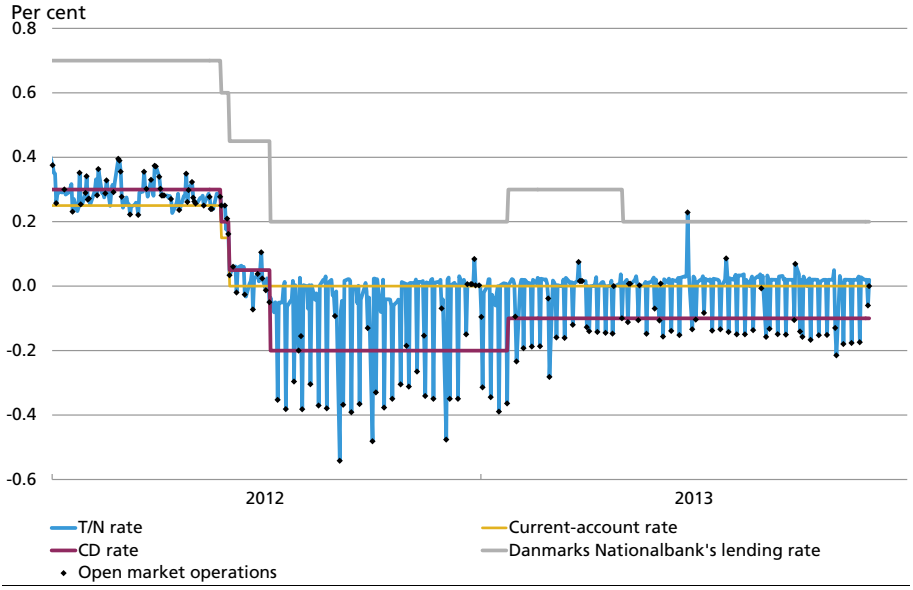
$\beta_0 + \beta_1$(Interest-rate pass-through) + β_2(Internal spread) + β_3VIX(-1) + $D\beta_{D,0}$ + $D\beta_{D,1}$(Interest-rate pass-through) + $D\beta_{D,2}$(Internal spread) + $D\beta_{D,3}$VIX(-1)

The explanatory variables and the results of the regression analysis are explained in more detail in the following.

Interest-rate pass-through

The T/N rate shows considerable day-to-day fluctuations, cf. Chart 5. Most of the fluctuations are technical and relate to the design of the monetary-policy instruments. The fluctuations arise in connection with Danmarks Nationalbank's open market operations, because the monetary-policy counterparties can thus place funds in certificates of deposit at a different interest rate and at longer maturities, compared to current-account deposits. The variable "Interest-rate pass-through" is included in order to examine whether the overnight rate is behaving according to the predictions made on the basis of monetary-policy interest rates. This relationship is described in more detail in Box 3.

MONETARY-POLICY RATES AND THE T/N RATE — Chart 5



Note: The T/N rate is affected on the day before the open market operation, since T/N loans are overnight loans that start on the day after conclusion. Hence, open market operations denote the T/N-rate value on the day before the open market operation.

Source: Danmarks Nationalbank.

TECHNICAL VOLATILITY IN THE OVERNIGHT RATE Box 3

It is possible to gain insight into the technical fluctuations in the overnight rate on the basis of the theoretical relation between the money-market rate and the monetary-policy rates. According to the relation, the overnight rate will, on days without open market operations, be equal to the current-account rate, which is the alternative rate of interest for overnight loans in the money market for the monetary-policy counterparties. On days with open market operations, the monetary-policy counterparties have access to buy (or sell) certificates of deposits (CDs), besides access to the current account. Accordingly, the CD rate is the alternative interest rate for the rate of interest on money-market placements until the next open market operation.[1] Counterparties with a liquidity surplus will assess the trade-off of the return on placing funds in CDs against current placement in the overnight money market until the next open market operation. As mentioned, the rate of interest on money-market placements corresponds to the current-account rate on the following days. When the CD rate is higher than the current-account rate, the overnight rate on the day of the open market operation should therefore be higher than the CD rate if the total return on placement in the money market is to be equal to placement in CDs.[2] In the current situation, with a negative CD rate lower than the current-account rate, the overnight rate on the day of the open market operation must be lower than the CD rate.[3]

The calculation of the theoretical overnight interest rate can be illustrated by an example involving a Friday when an ordinary open market operation is carried out. Assume that the next open market operation is 7 days away. The overnight rate on the Friday covers three days (Friday, Saturday and Sunday). On the following four days, the overnight rate is equal to the current-account rate. The counterparty's assessment of the trade-off between placement in certificates of deposit or in the money market can thus be written as:

(2) 3•Overnight rate + 4•Current-account rate = 7•CD rate

If the current-account rate is 0 per cent and the CD rate -0.10 per cent, the theoretical overnight rate on the basis of the above equation is -0.23 per cent. (= (7•(-0.10) – 4•0)/3 per cent). "Interest-rate pass-through" will have this value on the day of the open market operation and the value of zero on the other banking days when the theoretical overnight rate is equal to the current-account rate of 0 per cent.

Normally, the technical volatility in the overnight rate has no effect on the slightly longer money-market rates, which determine the exchange rate of the krone, cf. Andersen (2004).

[1] Besides buying and selling certificates of deposit, the counterparties in the ordinary open market operations may raise liquidity through loans from Danmarks Nationalbank. If the net position is positive, the CD rate tends to be key to the money-market rates. In June 2009, a spread was introduced between Danmarks Nationalbank's lending rate and the CD rate, which had been identical until then. The net position has been positive since the introduction of this spread.

[2] The effect on the overnight rate is stronger, the longer the time until the next announced open market operation, and the fewer the days until the next banking day, i.e. the fewer the days on which the overnight rate on the day of the market operation applies. If, for example, the open market operation falls on a Friday, the overnight rate on the day of the open market operation applies on three days (Friday, Saturday and Sunday), and the effect is distributed on the three days. The O/N rate is affected on the day of the open market operation, while the T/N rate is affected on the day before the open market operation, since the T/N rate is the rate of interest on an O/N loan starting on the following day.

[3] When counterparties' total placements in current accounts and certificates of deposit exceed the current-account limit, the counterparties can benefit from lending in the overnight market at a lower (more negative) interest rate than the CD rate, as the counterparties would thus avoid placing funds in certificates of deposit until the next open market operation.

ESTIMATION RESULTS FOR THE EFFECT ON THE SPREAD BETWEEN THE T/N RATE AND THE CURRENT-ACCOUNT RATE Table 1

	Before negative CD rate	After negative CD rate
Constant	-0.050*	0.010
	(0.030)	(0.021)
Interest-rate pass-through	0.545***	0.717***
	(0.025)	(0.017)
Internal spread	0.452***	0.363***
	(0.088)	(0.066)
VIX (-1)	0.003**	0.003**
	(0.001)	(0.002)
Adjusted R^2: 0.82		

Note: Based on daily data. *, **, *** denote levels of significance of 10, 5 and 1 per cent, respectively. Standard deviations are denoted in parenthesis. "Before negative CD rate" are coefficients on the explanatory variables. "After negative CD rate" shows estimates of the sum of the coefficients on the explanatory variables and the dummy variable*(explanatory variable). Standard errors and the level of significance have been found via a Wald test. The spread between the T/N rate and the current-account rate, "Interest-rate pass-through" and "Internal spread", are in percentage points.

The coefficient on "Interest-rate pass-through" is higher after the introduction of a negative CD rate, cf. Table 1. The increase is statistically significant. This means that the pass-through is intact. The coefficient after the introduction of a negative interest rate is 0.72, corresponding to an average increase by 0.72 percentage point in the T/N rate when "Interest-rate pass-through" indicates a 1-percentage-point increase. This reflects that the overnight rate is not only determined by "Interest-rate pass-through".

Internal spread

The interest-rate effect of monetary-policy rates is basically captured in "Interest-rate pass-through". "Internal spread" is included as an explanatory variable in order to describe the effect of liquidity conditions in the money market. Specifically, it captures the effect of a growing incentive – in step with widening of the spread – for monetary-policy counterparties to buy certificates of deposit rather than placing funds in current accounts. Hence the wider the spread, the smaller the balance on the current account, all else equal, which will have an upward effect on the spread between the overnight interest rate and the current-account rate, cf. Chart 6.[1] The coefficient on "Internal spread" before the

1 The monetary-policy counterparties do not have access to a standing lending facility at Danmarks Nationalbank for overnight borrowing. Thus, Danmarks Nationalbank's monetary-policy instruments do not put a cap on the overnight rate.

introduction of a negative CD rate is positive, as expected, and significant, cf. Table 1.[1]

After the introduction of a negative CD rate, which is, moreover, lower than the current-account rate, the counterparties have both an interest incentive and a liquidity incentive to place funds in current accounts rather than in certificates of deposit. At the same time, the current-account limits have been expanded. As a result, the monetary-policy counterparties have ample current-account deposits to cope with liquidity fluctuations, so there will be no low current-account balances which could push up the overnight rate, cf. Chart 6. The spread between the CD rate and the current-account rate now captures the conversion of counterparties' current-account deposits beyond their current-account limits into certificates of deposits if the total current-account balance exceeds the total current-account limits, cf. Box 2. If the counterparties find that the overall current-account limits are likely to be exceeded, they may be willing to lend at a lower interest rate than would otherwise be the case. The effect of "Internal spread" is positive, as expected, and still statistically significant, cf. Table 1. The coefficient is smaller after the introduction of a negative CD rate, but the change in the coefficient is not statistically significant. [2]

VIX

The overnight rate is also impacted by a number of other factors, including market perceptions of risk in the uncollateralised market, interest-rate expectations, etc.[3] The VIX index, which indicates the implied volatility of options on the US stock index S&P 500, has been included as an explanatory variable. The VIX index is often used as an indicator of financial turmoil and the general risk perception in the market. Higher uncertainty is expected to entail a higher T/N rate relative to the current-account rate, which gives a positive coefficient. The change in the coefficient at the introduction of a negative CD rate is not statistically significant.

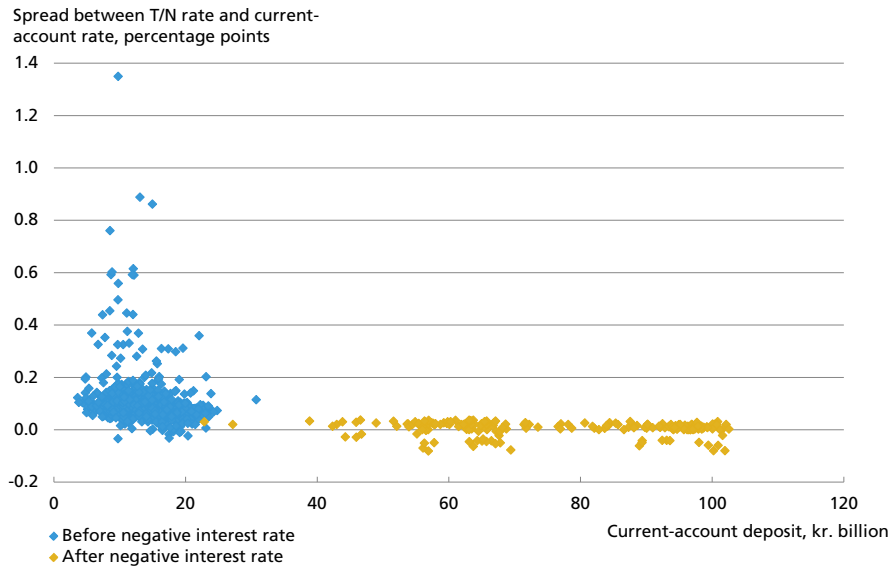
Overall, the model can explain most of the variation in the overnight interest rate both before and after the introduction of a negative CD

1 Regressions have been performed where the total current-account balance is included as explanatory variable (not shown). The related coefficient tends to become insignificant or have the opposite sign compared with what is expected in regressions that also include "Internal spread". In regressions including current-account balances as an explanatory variable instead of "Internal spread", the coefficient is negative, as expected, cf. Chart 6, and significant before the introduction of a negative CD rate.

2 If the current-account balance is included instead of "Internal spread" in the regression, the related coefficient is close to zero, as expected, cf. Chart 6, and insignificant after the introduction of a negative CD rate (not shown).

3 The credit risk on uncollateralised overnight loans points to a higher interest rate than the current-account rate. However, the credit risk is limited by the short maturity of the loans.

RELATION BETWEEN CURRENT-ACCOUNT DEPOSITS AND THE SPREAD BETWEEN THE T/N RATE AND THE CURRENT-ACCOUNT RATE Chart 6



Note: Daily observations for the period 2 July 2007 – 30 August 2013. Observations from days when Danmarks Nationalbank does not carry out open market operations.
Source: Danmarks Nationalbank.

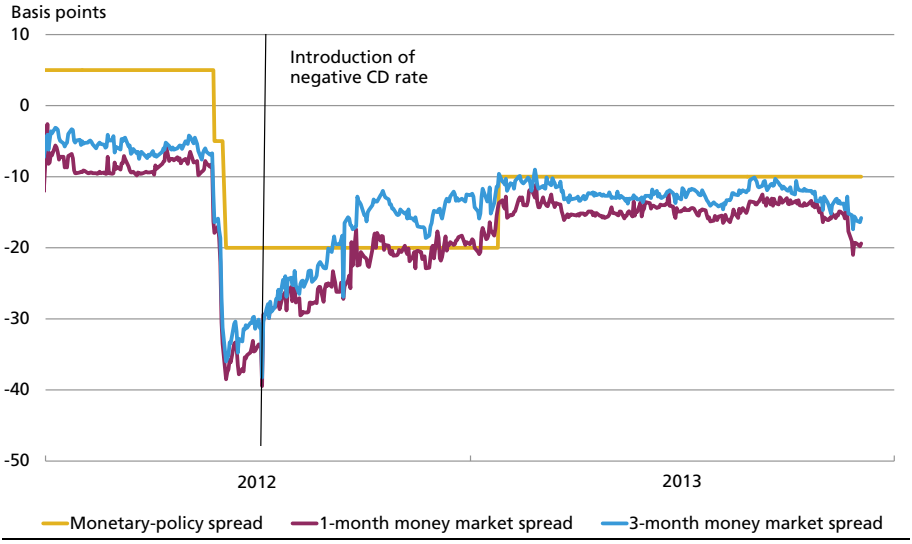
rate, and its explanatory power regarding the variation is at least as good after as before.[1] The effect of "Interest-rate pass-through" is increased by the introduction of a negative CD rate, supporting that the interest-rate pass-through is intact after the introduction of a negative CD rate.

Interest-rate transmission to longer money-market rates

The impact of monetary-policy instruments on the overnight rate is the first step in the interest-rate transmission to the longer money-market rates, in which expectations of future changes in monetary-policy rates play a key role. Likewise, a clear pass-through has been observed from the negative CD rate to the slightly longer money-market rate, e.g. the CITA rate, cf. Chart 4. The interest-rate spread to the euro area determines the exchange rate of the krone against the euro. The spread between the longer money-market rates in Denmark and the euro area has mirrored the development in the spread between Danmarks Nationalbank's and the ECB's monetary-policy rates, cf. Chart 7, and the krone has remained stable since July 2012.

1 As an alternative to a model with dummy variables, the model can be estimated on data before and after, respectively, the introduction of a negative CD rate. The explanatory power of the model (adjusted R^2) is highest when estimated on data after.

INTEREST-RATE SPREAD BETWEEEN DENMARK AND THE EURO AREA Chart 7



Note: The monetary-policy spread is the CD rate less the ECB's deposit rate. The money-market spread is the difference between the CITA rate and the EONIA swap rate.
Source: Danmarks Nationalbank and Reuters EcoWin.

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Normalisation of the Collateral Basis and Discontinuation of 6-Month Loans

In connection with the financial crisis, the opportunities of banks and mortgage banks to borrow from Danmarks Nationalbank were expanded to include 6-month loans. At the same time, banks' credit claims and a number of other assets were included in the collateral basis for loans from Danmarks Nationalbank.

The situation in the financial markets and in the sector is now stable. Furthermore, use of the additional opportunities to borrow from Danmarks Nationalbank has been limited.

The opportunity of raising 6-month loans will be discontinued as from 1 July 2014. Accordingly, Danmarks Nationalbank will offer 6-month loans for the last time on 27 June 2014. Loans raised will run until they mature.

As from 1 July 2014, the banks' own credit claims of good quality as well as sector company shares and bonds will no longer be included in the collateral basis. Government-guaranteed uncollateralised debt issued by credit institutions will remain part of the collateral basis until the arrangement expires in 2016.

Backdrop to the arrangements

Danmarks Nationalbank's 6-month lending facility was introduced in October 2011. At the same time, banks' credit claims of good quality became part of Danmarks Nationalbank's collateral basis. The new opportunities to borrow were introduced with a view to supplementing the banks' access to liquidity and facilitating the transition on expiry of the individual government guarantees in 2012-13.

In August 2011, the temporary collateral basis was expanded with sector company shares, i.e. shares in the companies jointly owned by the banks, e.g. data processing centres.[1] In May 2012, the temporary collateral basis

[1] The arrangement constituted a partial reopening of a temporary arrangement that was phased out in February of the same year.

was supplemented by sector company bonds, i.e. bonds issued by sector companies.

Use of the arrangements

Use of the above arrangements has been limited. Very few banks have made use of the 6-month lending facility, and total outstanding lending under the arrangement currently amounts to kr. 3.4 billion.

The assets to be phased out from the collateral basis have only to a modest extent been pledged as collateral for loans at Danmarks Nationalbank. At the end of November 2013, the banks pledged credit claims for kr. 7 billion, corresponding to 8 per cent of the assets pledged to Danmarks Nationalbank. In November, the banks' pledging of sector company shares amounted to about kr. 0.6 billion. Currently, no sector company bonds are eligible as collateral.

Following the adjustment of the collateral basis, the sector as a whole and the individual banks will generally have sufficient eligible assets to meet their borrowing requirements in Danmarks Nationalbank. The banks will still be able to meet the statutory liquidity requirements.

Speech by Governor Lars Rohde at the annual meeting of the Association of Danish Mortgage Banks on 26 September 2012

The global economy is recovering at a moderate pace. In the 2nd quarter, the euro area saw positive growth for the first time in 18 months, and looking ahead, the economy is expected to pick up further, albeit slowly. Activity in the US economy is also set to grow, although bond yields are beginning to rise. Growth is supported by extremely accommodative monetary policy, with the Fed funds target rate close to zero and current large-scale asset purchases.

Activity in the Danish economy remains below its potential level, but here, too, there are signs that the situation is beginning to improve. GDP grew by 0.5 per cent in the 2nd quarter. Private consumption was flat, as it has basically been since 2010. In Danmarks Nationalbank's assessment, macroeconomic balances have now more or less been adjusted following the years of overheating of the economy and the subsequent downturn, and the foundations for renewed growth are in place. Signals from abroad are also more encouraging. Danmarks Nationalbank projects growth at just over 1½ per cent in 2014 and 2015. That is higher than the average growth rate expected for the euro area, but in line with the outlook for Germany.

Over the last year, households have begun to take a more optimistic view of the housing market, and more people now expect prices to rise. But the recovery is unevenly distributed across the country. Prices of flats in Copenhagen have risen by more than 10 per cent over the last year.

With the most recent overheating of the Danish housing market in mind, we might now begin to ask whether things are moving a bit too fast in Copenhagen. However, the price increases should be seen in the light of the preceding strong fall in 2008-09 and the decline in 2011. An article in Danmarks Nationalbank's most recent Monetary Review compares price levels for flats in northern European capitals. While an average flat of 100 square metres costs kr. 2.3 million in Copenhagen, it would cost about twice as much in Stockholm and Oslo and three times as much in Paris. In Berlin, on the other hand, the price is kr. 1.9 million. Although these differences can hardly be used as indicators of national

price developments, they are illustrative and show that the price level in Copenhagen is not particularly high in an international perspective. Judging by the economic fundamentals, prices are not likely to continue to rise at the pace seen over the last year, and nor should they. In Danmarks Nationalbank's assessment, prices of flats in Copenhagen are not far from their equilibrium – although the equilibrium level is difficult to identify precisely. The equilibrium price can be expected to increase by 2-3 per cent annually, but experience shows that there may be large deviations from this trend. As Danmarks Nationalbank has previously pointed out, the structure of housing taxes contributes to instability in the housing market.

The outlook that the Danish economy will begin to pick up steam highlights the issue of how much spare capacity we actually have, and when the economy will begin to experience capacity problems. Danmarks Nationalbank compiles the output gap at minus 2½ per cent of GDP. That is not tremendously large, and the economy is expected to approach its potential level in the coming years. It is estimated that employment can increase by around 55,000 without creating inflationary pressures in the economy. This is a snapshot. A couple of years down the line, the figure will be higher if structural unemployment falls and the structural labour force increases as expected. Most of the increase in employment is to be achieved via a higher participation rate, while it is estimated that there is room for unemployment to fall by approximately 15,000. Irrespective of the measure of unemployment applied, unemployment is low viewed over the last few decades. In fact, we are already seeing the first signs that labour is becoming scarcer. For example, there has been a small increase in the number of firms reporting a shortage of labour, and there has also been a higher influx of foreign labour into the Danish labour market in the last few years. This does not indicate that unemployment is far from its structural level.

The outlook for the Danish economy does not indicate that fiscal policy should be eased. The timing could prove to be bad, by which I mean that fiscal stimulation of demand might accelerate an upswing, with the risk that the economy rapidly experiences capacity problems.

The new fiscal policy framework does not leave scope for further easing. The budget deficit is close to 3 per cent of GDP this year and in both 2014 and 2015 if the expected extraordinary revenue from early taxation of capital pensions is disregarded, as it should be. When the bill was passed, it was a precondition that revenue from such taxation that had been moved forward should be used to reduce the government debt. This revenue is extraordinary and temporary, and will entail a shortfall at a later time. The structural budget balance will deterio-

rate in 2014 and is close to the Budget Act's limit of minus 0.5 per cent of GDP. The conclusion is clear. There is neither a need for nor scope for fiscal easing.

Lending by banks and mortgage banks to the corporate sector has been virtually unchanged since 2008. But there has been a redistribution among the credit institutions, so that lending by mortgage banks has increased, while lending by banks has declined. This may reflect the need for some banks to consolidate after the financial crisis, encouraging customers – especially firms – to raise mortgage loans rather than bank loans. At the same time, some firms may have found mortgage loans more attractive. In addition, firms have increasingly sought alternative sources of funding, such as corporate bonds, sector loans and trade credits, export guarantees, etc.

The mortgage banks have been able to meet the demand for loans and have thereby contributed to a stable supply of credit in the crisis years. This applies not only in relation to corporate customers, but also in relation to households.

The number of families falling behind on their mortgage payments has been low since the mid-1990s. Even the financial crisis led to only a small increase in the arrears ratio for mortgage debt. The question is whether this is also likely to be the case in future. Danish households have far more debt relative to income than families in other countries. This has caused some concern among observers of the Danish economy as to whether the families will be able to service their debt, especially if the Danish economy were to be affected by another serious recession . Let me state this very clearly: Danmarks Nationalbank does not share the view that the high debt ratio among households is a problem in relation to financial stability. Even financially squeezed households typically service their mortgages and cut down on private consumption instead. This affects demand in the economy and hence the corporate sector. That has an impact on macroeconomic stability rather than financial stability, but indirectly the banks may also be affected.

Danmarks Nationalbank's most recent Monetary Review evaluates a number of stress scenarios in which interest rates and unemployment soar and house and equity prices dive. While the selected stress scenarios would led to loan impairment charges for the financial sector overall, the calculations do not point to the mortgage banks being particularly severely affected. This is because the mortgage loan is nearly always the last item of debt that a family with a tight budget defaults on. For most families, even considerable worsening of their finances would lead to only a small increase in the probability of falling behind with mortgage payments.

The Danish economy has stabilised. That is also true of the financial sector. For the first time since the collapse of Roskilde Bank in the early summer of 2008, the summer has been quiet – and even sunny. But there are, nevertheless, a couple of financial summer stories to tell.

The first one is about F1 loans, i.e. mortgage loans with annual refinancing. The current debate was triggered by a word of warning from S&P. But the debate on the robustness of the construction behind the F1 loans is much older. Particularly after the auction in December 2008, people began to say, "suppose that...". Suppose that the bonds had not been sold. At that time it was more the rule than the exception that markets froze. Liquidity typically dried up if doubts arose as to the credit risk.

Households' long-term loans with annual refinancing are based on bonds with much shorter maturities. This has given mortgage banks qualities resembling those of ordinary banks, in that there may be "runs" on them. That risk did not exist under the old mortgage credit model since all loans were "prefinanced".

So the question is, what would happen in practice if a mortgage bank finds itself in a situation – due to uncertainty about the credit risk, perhaps – in which it cannot sell short-term bonds in connection with refinancing.

The brief answer is that Danmarks Nationalbank will act as the lender of last resort – as it does for other banks – if the mortgage bank is solvent and can pledge adequate collateral. In practice, the latter would presumably be all the bonds not sold in the market.

Mortgage bonds, also bonds issued by the mortgage banks themselves, are now part of Danmarks Nationalbank's collateral basis, i.e. they may be pledged to Danmarks Nationalbank as collateral. This option will limit the impact of a scenario in which bonds are difficult to sell. So the response to S&P and others is that this is not an immediate threat to financial stability in Denmark.

BUT this does not mean that a business model based on Danmarks Nationalbank as the backstop is expedient for private-sector financial institutions. That is not a sustainable solution.

One of the strengths of the Danish mortgage credit model should be that it is, inherently, so robust that no subsidisation whatsoever is required. That is exactly what the balance principle aims at. To the extent that it is possible, the mortgage bank should take on credit risk, but no other types of risk.

Investor confidence in the creditworthiness and liquidity of mortgage bonds is at the core of the Danish mortgage credit system. I have on other occasions argued that, in order to maintain this confidence, the mortgage banks should take a cautious approach and not go too near

the statutory limits. The more resilient the mortgage banks are to losses, the greater is the probability that they can meet their obligations to investors. And all other things being equal, it will take a greater shock to trigger a "run" on the mortgage banks.

I would like to take this opportunity to acknowledge the initiatives already taken with a view to addressing this issue. Auctions are now spread over the year, business models and product ranges are being adjusted, and pricing structures are being changed in order to give borrowers incentives to choose products with lower refinancing risk. All these initiatives make positive contributions to the sustainability of Danish mortgage credit. But the system still involves considerable refinancing risk. In 2014, bonds linked to adjustable-rate loans totalling more than kr. 750 billion are currently set to fall due, and the auctions towards the end of the year will be of more or less the same size – just over kr. 400 billion – as the auctions in December 2008.

The Danish mortgage credit system has served us well for many years and proved its worth during the financial crisis. All the same – and for good reasons – it remains a subject of debate. I do not believe that we can or should return to the old mortgage credit model. But it is important that you find long-term solutions.

The second summer topic has been regulation of the financial sector in the wake of the financial crisis. Both at the international and national level, politicians have taken action during the crisis. A wide range of measures have been introduced: increased capital and liquidity requirements, enhanced governance requirements for financial institutions, a new crisis management regime, to mention but a few. In addition, the Danish Financial Supervisory Authority has been given additional resources and powers. The crisis revealed various weaknesses, and they have been addressed. But as we have seen previously, pressures to ease the rules will emerge at some point.

Personally, I am rather surprised to see what is happening in Denmark. The Bank Rescue Packages enjoyed broad political support and until recently they had a clear aim: a financial crisis – never again! The time had come to tidy up and tighten the rules. However, winds of change seem to be sweeping across the political landscape. Has the Danish Financial Supervisory Authority now been given too much power, and have the requirements imposed on mortgage banks become too tight? It is as if the financial crisis has already been forgotten. But I would be surprised if our collective political memory is that short. If so, it would be shorter than in other European countries.

So I would like to remind you that in Denmark we provided massive support during the financial crisis, and the government took on huge

risks on behalf of the tax-payers. Under Bank Rescue Package 1, the government provided guarantees for an astronomical kr. 4,200 billion. With Bank Rescue Package 2, the government gave the financial sector a capital injection of kr. 46 billion in order to prevent a potential credit crunch, and it guaranteed debt issuances of kr. 194 billion. On the fifth anniversary of the introduction of the general government guarantee, the government has still injected capital totalling kr. 31 billion into the sector. So far, the government has not had any direct costs that have not been covered by the sector's payments for this support, but the risk has been enormous.

In that perspective there can be no doubt that there was a need for tightening. Yes, we have come a long way in terms of tidying up, but it would be unfortunate if the pendulum has already begun to swing back.

Thank you for inviting me to speak.

Speech by Lars Rohde at the annual meeting of the Danish Bankers Association on 2 December 2013

A few months ago, the sixth Danish Bank Rescue Package was neatly wrapped up. I would like to take this opportunity to acknowledge the political responsibility shown in that connection.
Danmarks Nationalbank welcomes the agreement. It broadly observes the recommendations of the SIFI Committee to identify systemically important financial institutions and impose extra requirements, including stricter capital requirements, on these institutions.

The agreement is an important milestone in the follow-up of the crisis, but it is too early to put our feet up. As the agreement indicates, there are still important issues that the parties need to settle, presumably in 2014. These include crisis management and crisis management buffers. The final level of the Danish SIFI requirements will also be reviewed in 2017 at the latest. If it does not match the level of comparable European countries such as Sweden, Germany and the UK, it will be adjusted.

Compared with the rest of the Nordic region, Denmark is imposing lower capital requirements on SIFIs and phasing them in more slowly. But besides the regulatory requirements there are market requirements. Particularly for SIFIs, which often operate internationally, market standards are typically one step ahead of financial regulation. I am convinced that, irrespective of the regulatory requirements, the market will ensure that actual capital adequacy is evened out over time.

The countercyclical buffer differs from the other capital requirements. It is not an immediate requirement, but a framework that can be activated if credit developments and the economic situation call for it. Unlike the other Nordic countries, Denmark is phasing in this framework gradually. In other words, new legislation will be required if economic developments in the transitional period until 2019 require a larger countercyclical buffer than the limitation of the framework for that year.

In the same way as Bank Rescue Package 6 underpins the largest credit institutions, the bill to address the mortgage banks' refinancing risk is an important contribution to financial stability.

The immense popularity of loans that are not prefinanced has led to a potential refinancing risk. Unlike in the old days, mortgage banks have a continuous need for refinancing in the market, and they might experi-

ence a situation resembling a "run" on a bank. It is very unlikely that this will happen, but the consequences could be enormous. At Danmarks Nationalbank we have pointed out this risk, and the rating agencies have also focused on it.

Let me make it very clear that in Danmarks Nationalbank's opinion compulsory, conditional maturity extension provides a solution to this problem.

The bill leaves no doubt as to what will happen if interest rates suddenly rise very sharply or an auction fails. The refinancing risk is transferred to investors. For the mortgage banks, risk is, once again, limited to credit risk, which was the original idea behind the balance principle.

It is important that the bill includes an interest-rate trigger, so that maturity extension takes effect in connection with very large, but well-defined interest-rate rises. This makes it possible for investors to determine the price of maturity extension.

This structure does not affect Danmarks Nationalbank's role as lender of last resort, but it ensures that the mortgage banks' business model does not rely on Danmarks Nationalbank as back stop. In connection with the preparatory work, Danmarks Nationalbank indicated that the bill does not in itself give reason to change Danmarks Nationalbank's collateral basis.

The bill also presents a credible resolution model. All doubts will be eliminated as to what will happen to mortgage bonds that have not been prefinanced if a mortgage bank is wound up. The bonds will be converted into long-term fixed-rate bonds with the same payment series as the underlying loans.

Irrespective of the bill, borrowers with variable-rate loans will remain sensitive to general developments in interest rates. As long as the Danish economy is in synch with the international economy, increased interest-rate sensitivity may dampen fluctuations in the economy and have a stabilising effect. Variable-rate loans have unquestionably helped to stabilise the housing market during the financial crisis.

Variable-rate loans entail a payment risk for the borrower, while fixed-rate loans entail a price risk. In order to maintain investor confidence in the mortgage-credit system, the mortgage banks should take a portfolio view when assessing their total lending. The future Supervisory Diamond for mortgage banks will lay down the overall framework for the mortgage banks' risk profile, but first and foremost it is the mortgage banks themselves that are responsible for their own risk management.

In the interests of investor confidence and financial stability the mortgage banks should generally stay well within the statutory limits – also after this bill has been passed.

During the last 18 months, the Danish Productivity Commission has analysed the reasons for many years' low productivity growth in Denmark. Some sectors are more severely affected than others. The Commission has also presented a long list of proposals for improving productivity in various parts of the economy.

The financial sector plays an important role in Danish society as a provider of capital to households and firms, and it also offers products such as pension saving schemes and hedging of various types of risk. In addition, the sector ensures that domestic and cross-border payments can be transacted efficiently. So from society's point of view it is important that this sector is as efficient as possible – which means that its production costs should be as low as possible.

A rough indicator of developments in labour productivity in the financial sector can be obtained by looking at domestic lending – or alternatively financial assets – relative to employment in the sector. Calculated in this way, labour productivity was more or less constant in the decades before the liberalisation of the financial markets, which really took off in the early 1980s.

Liberalisation of capital flows across borders and deregulation of the financial sector in Denmark have provided considerable welfare gains. These gains are the result of lower prices and a larger product range, coupled with better opportunities for planning individual savings, consumption and investment. At the same time, financial sector productivity has increased substantially.

In fact, since 1980 productivity has grown by an average of 4-5 per cent annually in the financial sector. But in recent years lending by banks and mortgage banks relative to employment has been stagnant or shown a weak trend compared with previously. Domestic lending by banks relative to employment has even fallen.

Compared with the rest of the EU, Denmark is among the member states with the largest balance-sheet sum or domestic lending per employee. But in terms of cost-to-earnings ratio, Denmark is in the middle of the table. This could indicate that, at least on average, there is scope for further efficiency improvements in Danish credit institutions in the coming years. However, there are large differences within the sector. Comparisons of individual Danish and foreign banking groups show that some Danish banks are fully able to match the most efficient foreign banks. But at the same time a number of Danish banks are less efficient than the top Danish and foreign banks. For these banks, the scope for improvement is even greater than the average numbers indicate. Badly managed banks have been a key factor behind the sector's problems in the years after the financial crisis and the preceding overheating of the

economy. I welcome the Danish Bankers Association's new code of management. In your own words, this code is to address the "individual cases of bad management, mismanagement and inexpedient management structures seen during the crisis".

Turning to the international agenda, negotiations on a banking union are currently underway. Danmarks Nationalbank is following these negotiations closely. No decision has yet been made about Danish participation, but the banking union will, in any case, have great importance for Denmark. Even if Denmark opts out, two of the largest banks in Denmark will be subject to supervision by the ECB in relation to considerable parts of their euro area activities. At present, these two banks account for more than 50 per cent of total lending by Danish banks.

At the same time, it is essential to all EU member states that the project is a success. Financial stability in the euro area is a prerequisite for financial stability throughout the EU and has a large impact on future growth in the EU. At the same time, it is important that the banking union strengthens the single market for financial services.

A well-functioning banking union requires strong confidence in the single supervisory authority. An important step will be taken with the ECB's assessment of the assets and risks of credit institutions subject to direct supervision; this will take place in the coming year. A credible exercise of that nature will give the banks involved a solid, and in some cases much-needed, stamp of quality.

It is positive that the Danish Financial Supervisory Authority plans to replicate this exercise for the large Danish banks, to the extent that it is possible. In this context I would like to mention the results of Danmarks Nationalbank's most recent stress test, which will be published soon. They show that in all the stress scenarios the large banks have a Common Equity Tier 1 ratio of more than 8, which is the threshold in the ECB's stress test. Recent years' improved capitalisation is a major reason for this.

Danmarks Nationalbank generally takes a positive view of the banking union outlined. It is an important step towards strengthening the single market for financial services and hence cross-border competition. Competition forces both banks and firms to be "on their toes" and improve their skills. That is healthy and good for everyone.

It is important that euro area and non-euro area member states can participate in the banking union on equal terms. Otherwise, there is a risk that the single market for financial services becomes fragmented.

In addition, Danmarks Nationalbank finds it essential that the banking union includes an insurance element in relation to the systemic institutions in Denmark. A single, strong bank resolution fund could ensure

that. For the euro area member states, the ESM – the single euro rescue fund – provides extra insurance and will act as the ultimate back stop when all other funds have been depleted. Again, it is important to ensure equal treatment of participating euro area and non-euro area member states.

Now I would like to turn to the economy. The USA is in an upswing and growth accelerated a little in the 3rd quarter. Both the OECD and the IMF expect activity to pick up further over the next year. The upswing is being driven by private investment and consumption, supported by rising employment and an improved housing market.

In the euro area, macroeconomic developments have matched expectations, which is something we have not seen for quite a while. The weak positive growth is set to continue into the 2nd half of 2013, but still with large differences within the area. Especially German domestic demand is beginning to fuel growth. Unemployment is low in Germany and wage inflation rising, but Germany's competitiveness remains strong. The UK has seen a continuous series of positive economic indicators, and so has Sweden to some extent, although the Swedish economy did slow down in the spring. Overall, the outlook is getting brighter in some of Denmark's largest export markets.

In Denmark, both households and firms have begun to take a more optimistic view of their own finances and the Danish economy in the last six months, but for the households this has not really been reflected in increased spending yet. All the same, the stage seems to be set for increased private sector spending. Households and firms have been consolidating for a while, and the level of unemployment is stable and not high by historical standards. Moreover, financial conditions are strongly expansionary with a low level of interest rates.

The housing market has shown positive signs over the last year with rising cash prices. However, there is wide regional variation. So far, prices have predominantly risen in the Copenhagen area, while no improvement has yet been seen in the areas outside the cities. Presumably it will come if the market continues to pick up. All the same, there are regions in Denmark where the population is declining as many, especially young, people migrate to the cities. Outside the cities, the supply of homes for sale is high in many places, and there are no indications that the situation will change.

For the corporate sector, the outlook is slightly better, possibly because investments have been brought forward before the investment window closes at the end of the year. But activity remains low in the construction sector. Firms have accumulated considerable savings surpluses, and the future framework for banks and mortgage banks is to a

large extent in place. So it is not lack of financing opportunities that is dampening the level of investment.

Another positive factor is that some of Denmark's largest export markets seem to be keeping up steam, as I have already mentioned. All in all, there is reason for cautious optimism about the Danish economy, although we still have little tangible proof that the upswing has started. Inflation has been very low over the last year, both in Denmark and in the euro area. In Denmark, a number of factors – from energy prices to indirect taxes – are keeping inflation at bay. With low inflation and well-anchored inflation expectations, the ECB's Governing Council expects to keep the ECB's key interest rates at the current level or lower for some time yet.

The financial markets and the financial sector are now on a stable course, so Danmarks Nationalbank plans to phase out the additional borrowing options introduced in connection with the financial crisis.

The 6-month loans which Danmarks Nationalbank has offered to credit institutions since 2011 will be phased out from July 2014. Loans already raised will run until they mature.

At the same time, the list of assets eligible as collateral for loans from Danmarks Nationalbank will be restored to normal. This means that banks' credit claims and sector company shares will be phased out of the collateral basis.

Danmarks Nationalbank has carefully considered these changes and assessed the consequences for the sector overall and for the individual credit institutions. In Danmarks Nationalbank's assessment, the credit institutions can handle these changes. Use of 6-month loans has been very limited, and the assets to be phased out have only to a modest extent been pledged as collateral to Danmarks Nationalbank. And the credit institutions will still be able to meet the statutory liquidity requirements.

Overall, both the sector as such and the individual institutions will still have sufficient eligible assets for execution of Danmarks Nationalbank's monetary policy and settlement of payments.

Finally, I would like to touch upon our concerted efforts in relation to the new retail payments infrastructure. This year, it became possible for citizens and firms to transfer money within the same day. If we meet at the same time next year, I expect real-time transfers to be possible around the clock. These initiatives will bring productivity gains for banks, for Danmarks Nationalbank, for citizens and for firms in Denmark. I take this opportunity to express my appreciation of the sector's work on this project and of our good cooperation.

Thank you for your attention.

Press Releases

18 SEPTEMBER 2013: STATEMENT BY GOVERNOR LARS ROHDE ON THE PUBLICATION OF THE REPORT FROM THE COMMITTEE ON THE CAUSES OF THE FINANCIAL CRISIS

Publication of the Committee's report is part of the follow-up on the financial crisis. The costs to society have been high, so it is important to draw the lessons from the crisis.

In my view, the report gives a balanced account of the period before, during and after the crisis. As the Committee notes, many necessary and reasonable initiatives have already been taken.

The Committee points to various areas where improvements are still required. Danmarks Nationalbank supports the Committee's recommendations, but attaches special importance to two areas.

The Committee concludes that it is difficult to pursue discretionary economic policy and that automatic stabilisers are therefore important. Specifically, the Committee recommends amending the structure of property taxation so that it follows house prices. Danmarks Nationalbank has previously advocated this.

The report addresses the issue of capital requirements for credit institutions and presents several proposals for ensuring that their capitalisation is robust and transparent in future. This is an important area, and in Danmarks Nationalbank's opinion work on this should continue.

The Committee's report underlines how important it is to prevent crises by having sound macroeconomic and financial foundations. Experience from recent years shows that the costs to society of financial crises are high.

6 NOVEMBER 2013: SOLUTION TO THE MORTGAGE BANKS' REFINANCING PROBLEM

Danmarks Nationalbank is pleased to note that the government plans to present a bill to solve the mortgage banks' refinancing problems.

Danmarks Nationalbank has recommended the introduction of a law on compulsory maturity extension in case of very large yield increases for mortgage bonds with shorter maturities than the underlying loans. Such extension will take effect if the yield rises by more than 5 percent-

age points compared with the level at the previous auction, or if the auction fails.

This structure will also protect borrowers against sizeable increases in their interest payments.

Governor Lars Rohde, Danmarks Nationalbank, says: "Danmarks Nationalbank has repeatedly warned against excessive refinancing risk in the mortgage-credit system. In our assessment, compulsory, conditional maturity extension will solve this problem."

Lars Rohde adds: "Danmarks Nationalbank's analyses show that particularly short-term mortgage bonds have been more or less as liquid as Danish government bonds during the crisis. We expect that bonds with compulsory, conditional maturity extension will also be highly liquid. This is positive in terms of both financial stability and the functioning of the money market.

7 NOVEMBER 2013: DANMARKS NATIONALBANK'S INTEREST RATES UNCHANGED

The lending rate, the interest rate on certificates of deposit, the current account rate and the discount rate are unchanged.

The European Central Bank has decided to reduce its rate on the main refinancing operations by 0.25 percentage point and keep the rate on the deposit facility unchanged. In the current liquidity situation in the euro area the money market rates are marginally above the deposit facility which as mentioned is kept unchanged.

Since the monetary policy counterparties – the banks – have a large need to place funds at Danmarks Nationalbank, the monetary deposit rates de-termine the money market rates and the exchange rate. For this reason Danmarks Nationalbank keeps the interest rates un-changed.

Danmarks Nationalbank's interest rates are:

Lending rate: 0.20 per cent

Certificates of deposit: -0.10 per cent

Current account: 0.0 per cent

Discount rate: 0.0 per cent

11 NOVEMBER 2013: THE DANISH PAYMENTS COUNCIL'S REPORT ON NEW PAYMENT SOLUTIONS

The Danish Payments Council has published a report on the payments market in Denmark, focusing on new payment solutions used by retailers and on the Internet. The purpose of the report is to describe developments in the market for payment services, weigh the pros and cons of

a number of new payment solutions and identify any barriers to the rollout of such solutions.

Among other things, the report concludes that users of payment solutions want fast and inexpensive solutions, but also that users are a heterogeneous group when it comes to embracing new solutions. Technological advances, including the use of mobile phones as payment instruments, blur the distinctions between different payment methods. The new payment solutions mean that new market players gain in-creasing importance, and hence the European Commission has found it necessary to propose regulation on access to e.g. bank deposit ac-counts. The emergence of new market players, payment situations, and solutions creates new risks that users should be aware of. Finally, it is concluded that there are no major legislative or similar barriers that prevent the rollout of new payment solutions.

The Council was set up in 2012 as a forum for the future cooperation on retail and corporate payments in Denmark. The object of the Council is to promote the efficiency and security of these payments. The re-port was prepared by a working group comprising representatives of the Council members as well as other stakeholders and experts on payments in Denmark. The Council hopes that the analyses and results of the report will contribute to a constructive debate on future pay-ment solutions in Denmark.

The report will be translated into English and published at Danmarks Nationalbank's website, www.nationalbanken.dk in the near future. Information about the Council can be found at Danmarks Nationalbank's website.

2 DECEMBER 2013: NORMALIZATION OF THE COLLATERAL BASIS AND TERMINATION OF 6-MONTHS LOANS

During the financial crisis Danmarks Nationalbank widened the banks' access to collateralised credit facilities at Danmarks Nationalbank by introducing 6-months loans. In the same period banks' credit claims and a number of other assets were included in the collateral basis.

The current state of the financial markets and financial sector is stable. Furthermore the use of the widened credit facilities and collateral basis has been limited.

For these reasons the possibility of raising 6-months loans will be terminated with effect from July 1, 2014. Already granted loans will run to maturity. At the same time, sector company shares and banks' credit claims will be omitted from the collateral basis.