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Nationalbank

Monetary Review  
1st Quarter



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## MONETARY REVIEW 1st QUARTER 2008

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

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## Recent Economic and Monetary Trends

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*This review covers the period from mid-December 2007 to the beginning of March 2008*

There are now clear indications that the turmoil in the financial markets has real economic consequences. Growth in the West is expected to slow down. The same applies in the emerging markets economies, including China and India, but growth will remain strong. Inflation is high in most parts of the world, driven by higher food and energy prices.

Growth in the Danish economy is also declining. Both private consumption and investments saw lower growth in 2007 than previously. In spite of a sluggish housing market and falling share prices, the wealth of the Danish households remains sound, however, and employment is high.

Although demand is more subdued, there is a pronounced shortage of labour, which has led to a higher rate of wage and price increases. The Finance Act 2008 implies a continuation of the expansionary fiscal policies seen in recent years. This entails a risk that Denmark's competitiveness will be further undermined, which can lead to an unnecessarily high and protracted rise in unemployment, particularly if the strong global economic growth slows down.

### **THE GLOBAL ECONOMY**

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The global economy is expected to dampen in 2008 following several years of very high growth. Expectations have thus been adjusted downwards in line with an increasing awareness that the subprime turmoil will have real economic implications. The International Monetary Fund, IMF, estimates that global growth will fall to 4.1 per cent in 2008, from 4.9 per cent in 2007, cf. Table 1. The slowdown will be most pronounced in the West, while growth is expected to remain high in the emerging markets, despite a small decline.

Tightening of liquidity in the wake of the subprime turmoil meant that the spread between collateralised and uncollateralised money-market interest rates widened considerably. Central banks worldwide have gradually smoothed the functioning of the money markets, e.g. by providing liquidity, and by increasing access to dollar funding. The spreads between collateralised and uncollateralised interest rates in both the USA and the euro area have narrowed by around 0.50 percentage point

GDP GROWTH, FORECASTS

Table 1

Per cent p.a.	2007		2008	
	IMF	OECD	IMF	OECD
USA .....	2.2	2.2	1.5	2.0
Euro area .....	2.6	2.6	1.6	1.9
Japan .....	1.9	1.9	1.5	1.6
China .....	11.5	11.4	10.0	10.7
World <sup>1</sup> .....	4.9	n.a.	4.1	n.a.

Note: The IMF's forecasts are from January 2008, the OECD's from December 2007.

Source: IMF World Economic Outlook and OECD Economic Outlook, No 82.

<sup>1</sup> In relation to the IMF's October forecast, global growth has been adjusted downwards by approximately 0.4 percentage point for all years as the weights used for calculating PPP-GDP have been changed.

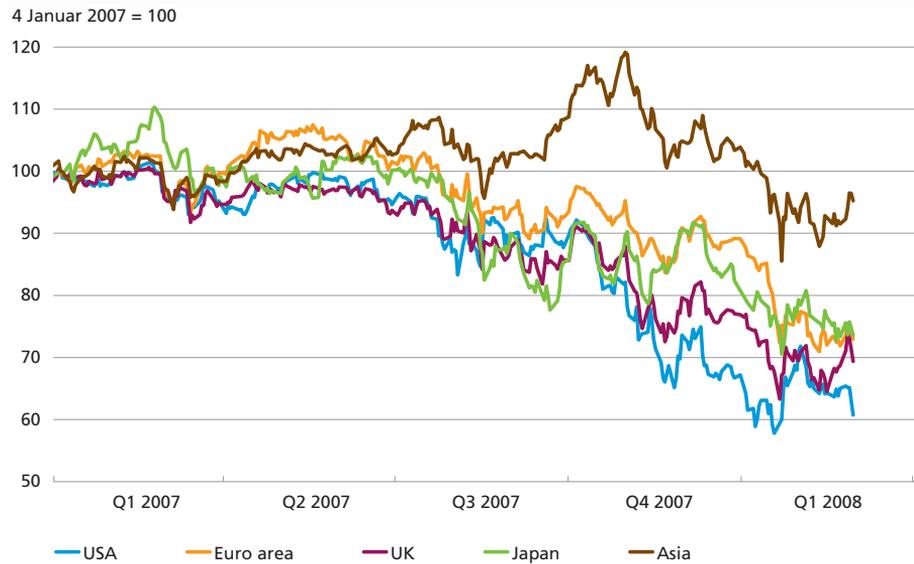
since their peaks, but remain above the very low level seen before the problems emerged in the late summer of 2007.

Risk premiums, i.e. the additional interest required for taking risk, have risen. Since the beginning of November 2007, the spread between government bonds and bonds rated BBB or higher has widened by 0.8 percentage point in the USA and 1 percentage point in the euro area, to approximately 2.3 percentage points in both economies.

Known subprime-related losses in the financial sector total around 120 billion dollars, but estimates indicate total losses could be as high as 400 billion dollars, cf. the statement by the German Minister of Finance after

PRICES OF BANK SHARES

Chart 1



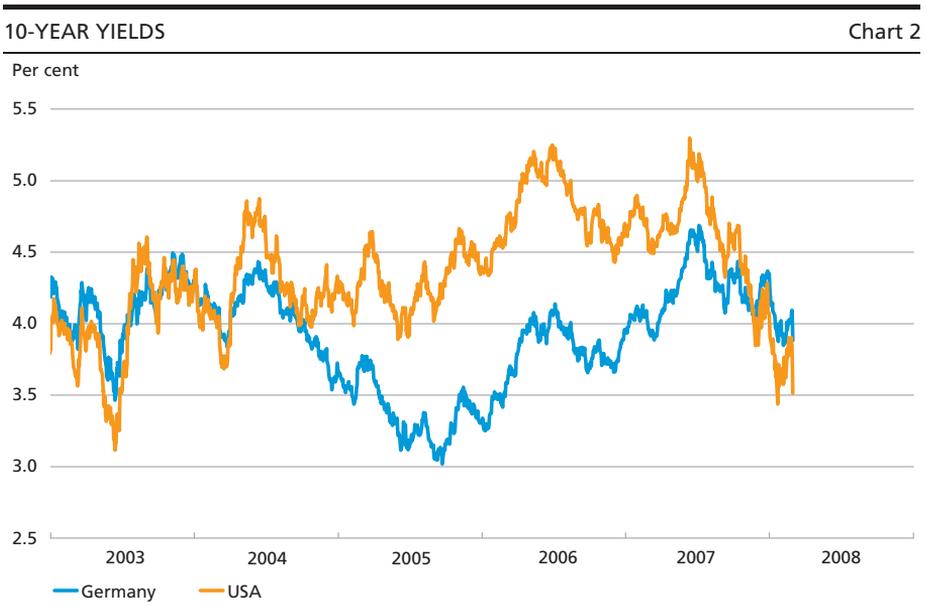
Note: The following stock indices have been applied. USA: Standard & Poor's, 500 Industry Group, Banks; euro area: FTSE, E300 Eurobloc Industry Sectors, Banks; UK: FTSE, All-Share Industry Sector, Banks; Japan: Nikkei, 500, Banking; Asia: FTSE/Hang Seng, Banks.

Source: EcoWin.

the G7 meeting in February. The subprime crisis and the mounting losses have had a negative impact on the price of bank shares worldwide, cf. Chart 1. Subprime-related losses, the calling of guarantees and the downgrading of a number of assets have reduced the solvency of several US and European banks. Since October 2007, banks in the USA and Europe have reported tightening of their credit terms.

In recent months monoline bond insurance companies have also come into focus. These companies provide insurance against credit risk on bonds, including securities linked to the subprime market. The financial turmoil has considerably increased the value of the policies, and thus the commitments of the insurance companies. The shares of two of the largest bond insurance companies have dropped by more than 80 per cent since the summer of 2007, and the companies potentially face downgrading. In that case, securities insured by the monoline companies will also be downgraded, which in turn will increase market uncertainty and entail further bank losses. Recent developments, however, indicate that for the time being these companies will not generally be downgraded. At the end of February, Standard & Poor's and Moody's retained their credit ratings for the largest US monoline bond insurance company. Moreover, the authorities and a number of financial enterprises are working on a restructuring plan, as well as a plan for raising further capital.

The prospect of lower growth means that US long-term yields have declined steadily since the summer of 2007, to 3.5 per cent at the beginning of March, cf. Chart 2. During this period, the Federal Reserve has

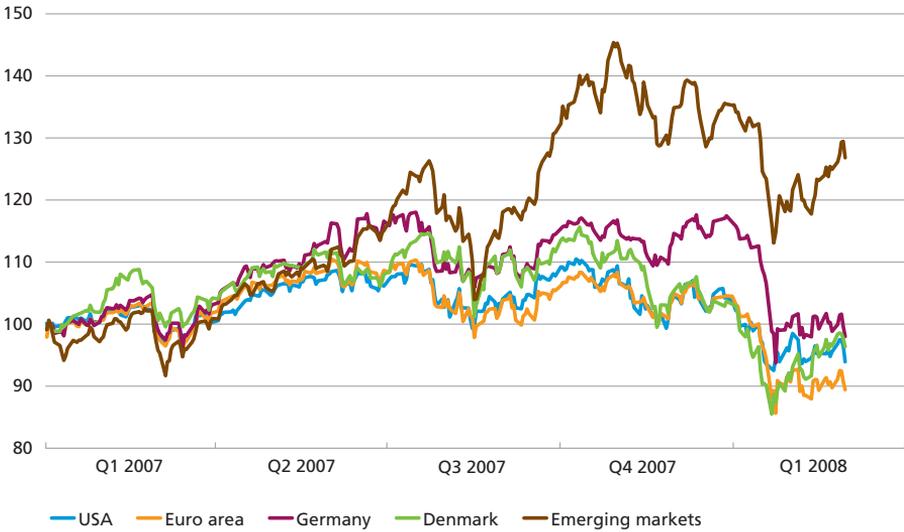


Note: 10-year benchmark government securities.  
Source: EcoWin.

## DEVELOPMENT IN STOCK PRICES

Chart 3

3 Januar 2007 = 100



Note: The following stock indices have been applied: *USA*: Standard & Poor's, 500 Composite; *euro area*: Standard & Poor's, Euro Composite; *Germany*: Deutsche Boerse, DAX 30; *Denmark*: Copenhagen SE, OMXC20 Index; *emerging markets*: MSCI, USD.

Source: EcoWin.

lowered the fed funds target rate by 2.25 per cent. The US 10-year yield is now just over 0.35 percentage point below its German equivalent.

The stock markets have also reacted to the weaker growth prospects, cf. Chart 3. The price falls on Monday, 21 January 2008 were among the largest in recent times. The Germany DAX30 index declined by more than 7 per cent and the MSCI<sup>1</sup> emerging-market index by almost 6 per cent. For both indices, this is the most pronounced drop since 2001. The Danish OMXC20 index fell by more than 5 per cent. In early March, share prices the USA, the euro area and Denmark were 5-10 per cent below their level one year earlier.

Oil prices remain very high. The strong economic growth in non-OECD countries has boosted the demand for oil. Combined with geopolitical tensions and only marginal increases in oil production, this has for short intervals pushed up oil prices to a level of more than 100 dollars per barrel, cf. Chart 4 on p. 7. The higher oil prices, together with higher food prices, have led to rising inflation in most countries worldwide, cf. Box 1. Inflation excluding energy and food has been relatively stable.

<sup>1</sup> MSCI: Morgan Stanley Capital International.

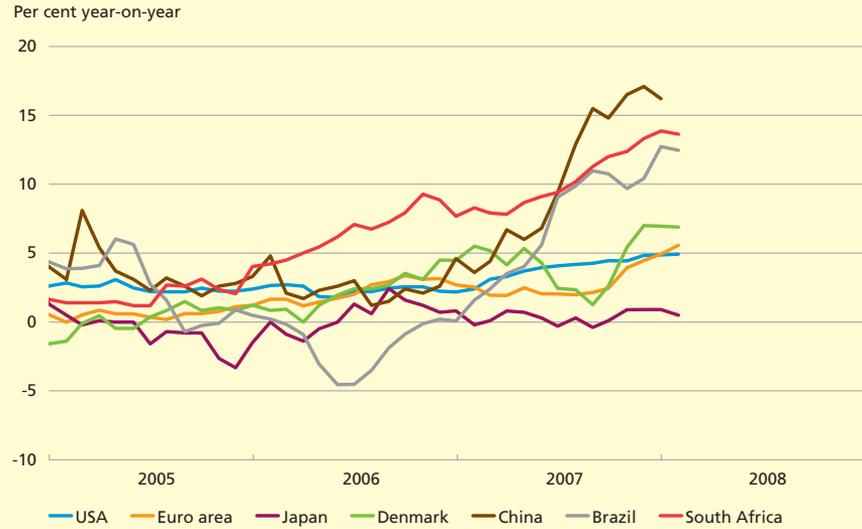
FOOD PRICES

Box 1

Food prices have risen steeply throughout most of the world in the last couple of years, cf. Chart 5. This is not a new phenomenon, but the current increases have received much attention and have been linked to e.g. higher production of biofuel derived from grain, sugar and maize.

FOOD PRICE INFLATION

Chart 5



Source: EcoWin.

Food price inflation is particularly pronounced in the developing countries. The reason is that higher prices for unprocessed food have a more significant impact on the prices of processed food in these countries. Commodity costs constitute a larger share of total manufacturing costs for processed food; for example, wage costs are lower in the developing countries than in the industrialised countries. This means that overall food prices are more severely affected by rising commodity prices, and consequently food price inflation is higher. In November 2007, food prices in China were thus 17.1 per cent higher than in November 2006, while food prices in the euro area rose by just under 5 per cent in the same period.

The elevated food prices are attributable to several factors. High energy prices have pushed up the cost of fertilisers and transport. Moreover, the supply of e.g. grain has been limited, one of the reasons being poor harvests in Australia, which has been hit by draughts for several years. Wheat production in Australia dropped by more than 60 per cent from 2005 to 2006, while global wheat production fell by approximately 4.5 per cent. The low harvest in 2006 meant that by the end of the year global grain inventories had reached the lowest level since 1983. This inflated prices further in 2007.

While global production has shrunk, demand has been growing. Greater affluence, particularly in Asia, has boosted the demand for meat and dairy products. Producing 1 kg meat requires around 8 kg of grain, and hence the demand for grain is rising.

CONTINUED

Box 1

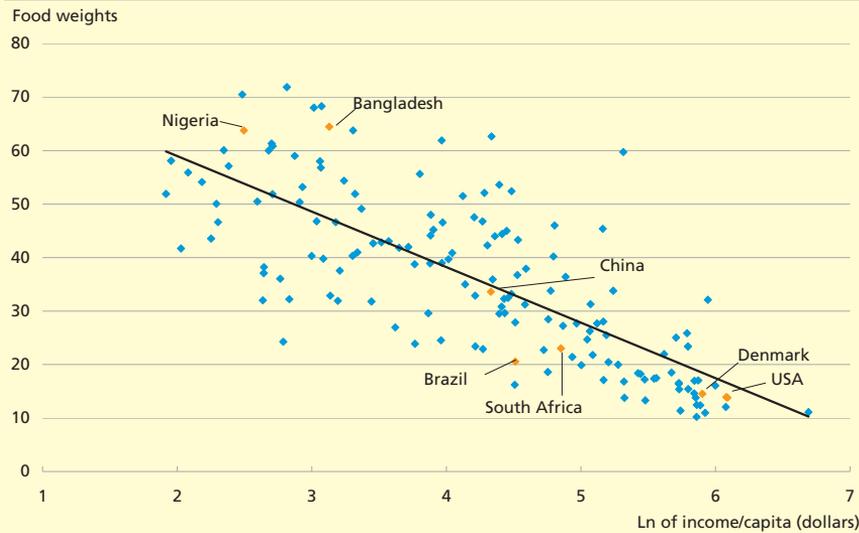
The strong focus on biofuel in the USA and the EU has also increased the demand for grain and maize. Higher prices have induced farmers to switch to these crops, which has kept price rises at bay, but has pushed up the prices of other crops. The decline in production in 2006 was four times higher than the consumption of grain for biofuel. "Normalisation" of weather conditions should therefore lead to a substantial rise in production and thereby to lower prices.

In the slightly longer term it is expected that residue such as straw and wood chips can be substituted for grain, maize and other food in biofuel production. In addition, it should be possible to enhance agricultural productivity in developing countries significantly. In Asia and South America the average yield per hectare is only one third of the yield in Europe.

The immediate consequence of rising foods prices is higher inflation and thus an undermining of purchasing power. Households in the developing countries are most severely affected since they spend a larger proportion of their income on food, cf. Chart 6.

FOOD WEIGHTS AND INCOMES

Chart 6



Note: Food weights indicate the weighting of food in the consumer price index.  
Ln is the natural logarithm.

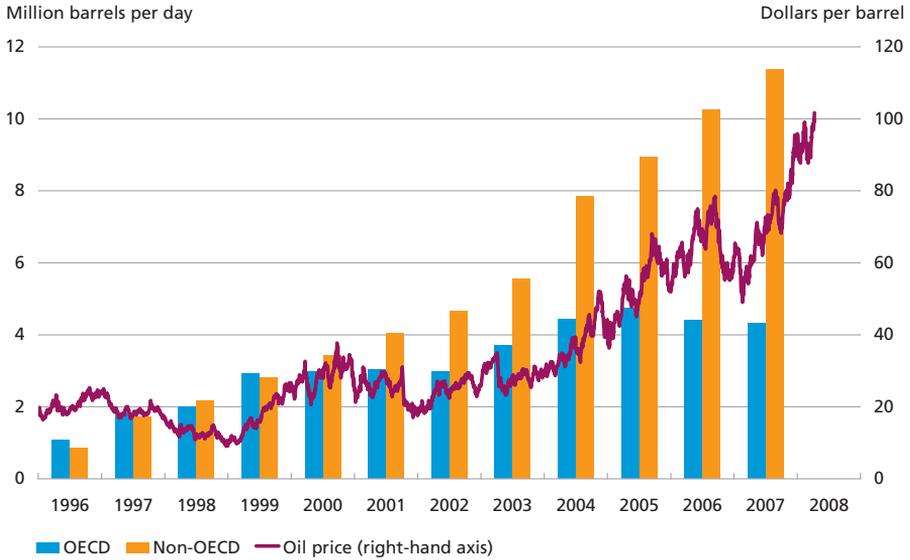
Source: IMF, World Economic Outlook, October 2007.

After having been steady for some months, the euro in February appreciated against the US dollar and the pound sterling, cf. Chart 7. The Chinese renminbi depreciated in line with the US dollar. Conversely, the euro has weakened vis-à-vis the Japanese yen and the Swiss franc during the last quarter.

The strengthening of the latter two currencies is attributable to the development in the stock markets, and in risk appetite in general. "Carry trades" – i.e. speculation in the spread between interest rates by borrowing in low-yield currencies such as the yen and the Swiss franc and

DEMAND FOR OIL AND OIL PRICE

Chart 4

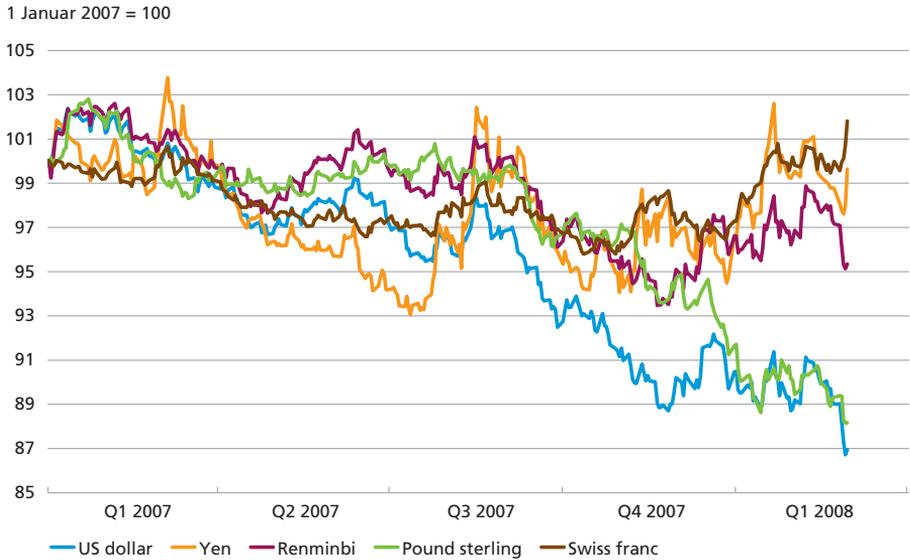


Note: The bars show the increase in daily oil consumption compared with 1995.  
 Source: EcoWin and OECD Economic Outlook, No 82.

investing in high-yield currencies – have had a major impact on the exchange rates of these currencies. In recent months, risk appetite has waned in the financial markets. This has led to the settlement of speculative positions, which in turn has strengthened the Japanese yen and the Swiss franc.

CURRENCY FLUCTUATIONS VIS-A-VIS THE EURO

Chart 7



Note: Euro per foreign currency unit. A falling index represents a strengthening of the euro.  
 Source: EcoWin.

## USA

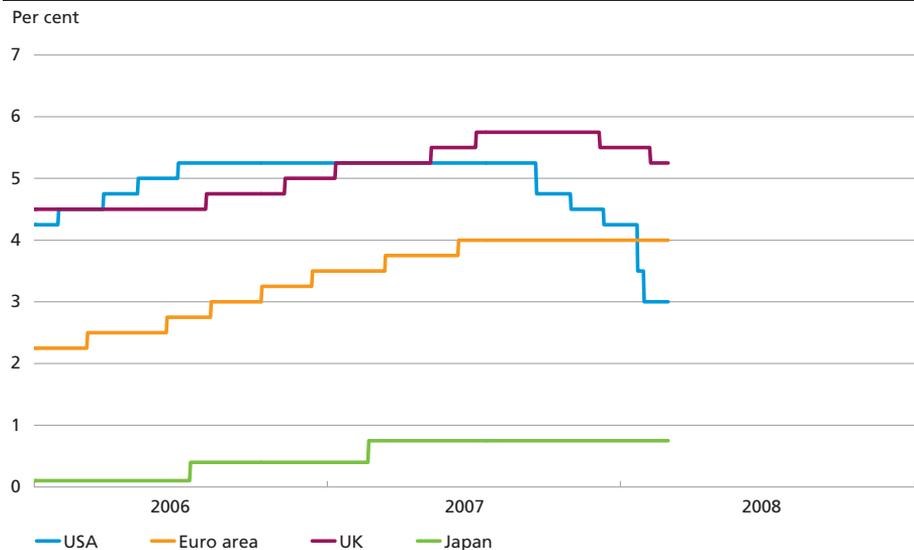
The USA is at the centre of the financial turmoil and the global slow-down. GDP rose by a mere 0.2 per cent in the 4th quarter of 2007, compared with 1.2 per cent in the 3rd quarter. The low growth was primarily related to residential investments falling by 25 per cent from the 3rd to the 4th quarter, which reduced overall investments by 0.9 per cent on the previous quarter. Private consumption, on the other hand, continued to show robust growth. US exports are still buoyed up by the weak dollar. The trade deficit was stable in 2007.

The labour market is also showing signs of weakness. In January, non-agricultural employment fell for the first time since 2003. Unemployment rose from 4.7 per cent in November 2007 to 4.9 per cent in January 2008. The ISM index, which is a confidence indicator for non-manufacturing enterprises, i.e. primarily the service, agriculture and construction sectors, rose again in February, having reached its lowest level since 2002 in January.

The signs of weakness in the US economy have triggered reactions from both the Bush administration and the Federal Reserve. Fiscal policy has been eased by 150 billion dollars, equivalent to just over 1.0 per cent of GDP, primarily by way of cash tax discounts, increased unemployment benefits, food assistance for the destitute and more lenient depreciation rules for the business sector. The administration is also working on a solution whereby more than 300,000 homeowners at

MONETARY-POLICY INTEREST RATES

Chart 8



Source: EcoWin.

risk can have the interest rates on their mortgages frozen at a fixed, low level for a certain period.

The Fed has lowered the fed funds target rate by a total of 2.25 percentage points over the last six months, cf. Chart 8, and expects inflation to fall in the coming months. In addition, the Fed, in collaboration with other central banks, has sought to smooth the functioning of the money markets. Access to dollar funding has been eased and a new lending facility has been introduced, whereby a broader range of assets may be pledged as collateral in connection with normal market operations.

## EMERGING MARKET ECONOMIES

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The emerging market economies have been growing at a rapid pace for many years. China and India now contribute approximately one third of global growth and have won considerable global market shares. The Asian emerging markets, spearheaded by China, account for more than one third of total global trade. Economic progress has made these economies more self-sustained, and they are expected to grow by 6.9 per cent in 2008 compared with 7.8 per cent in 2007.

*China's* GDP rose by 11.2 per cent in the 4th quarter compared with the 4th quarter of 2006. This is only slightly below the growth rate observed in the previous two quarters. Output growth was mainly driven by domestic investments. Export growth remains high, albeit declining on account of weaker demand in the USA and the strengthening of the renminbi.

In December 2007, annual inflation in China was 6.5 per cent, primarily reflecting rising food prices. The risk of overheating led the People's Bank of China to raise its interest rates by some 0.25 per cent in December 2007. In an attempt to curb lending growth, the central bank in January 2008 raised the reserve requirement imposed on banks to 15 per cent.

In *India* growth is high, but slowing down. Economic growth was 8.7 per cent from March 2007 to March 2008. Although the Indian rupee has appreciated against the US dollar over the last year, the Reserve Bank of India has kept its interest rate unchanged, citing a risk of higher inflation due to rising energy and food prices.

## EUROPE

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In the *euro area* there are indications that the economy is shifting to a lower gear. GDP growth was 0.4 per cent in the 4th quarter compared with the preceding quarter. In both Germany and France growth more than halved, to 0.3 per cent.

Retail turnover in the euro area was down by 1.2 per cent year-on-year in November and by a full 2 per cent in December, a rate of decline not seen for a decade. Industrial production also fell in both November and December.

The labour market has seen a favourable development with unemployment reaching 7.1 per cent in January, an all-time low for the euro area. Forward-looking confidence indicators have fallen somewhat in recent months, but remain at a sound level. The Purchasing Managers Index, PMI, is still above 50, which indicates expansion.

Consumer prices rose by 3.2 per cent in January. The high rate of inflation is primarily attributable to higher food and energy prices.

The ECB has maintained its key interest rate at 4.0 per cent since 13 June 2007. Money-market interest rates in the euro area (Eonia swap rates) indicate that market participants expect the minimum bid rate to fall by up to 0.75 per cent over the next year.

In the *UK*, GDP rose by 0.6 per cent in the 4th quarter, which was only slightly below the growth seen in the preceding quarters. There are, however, indications that growth in private consumption is declining, partly on account of steadily falling housing prices throughout the autumn and further tightening of credit conditions.

Inflation has been stable at around 2 per cent for the last six months after having exceeded 3 per cent in the spring of 2007. On 7 February, the Bank of England, BoE, lowered the bank rate by 0.25 percentage point to 5.25 per cent. In the assessment of the BoE there is a medium-term risk that inflation may fall below the target of 2 per cent as a result of declining activity.

In *Sweden*, Sveriges Riksbank raised the repo rate by 0.25 percentage point to 4.25 per cent in February, citing expectations of high inflation in a still favourable cyclical environment. Inflation was 3.2 per cent in January 2008.

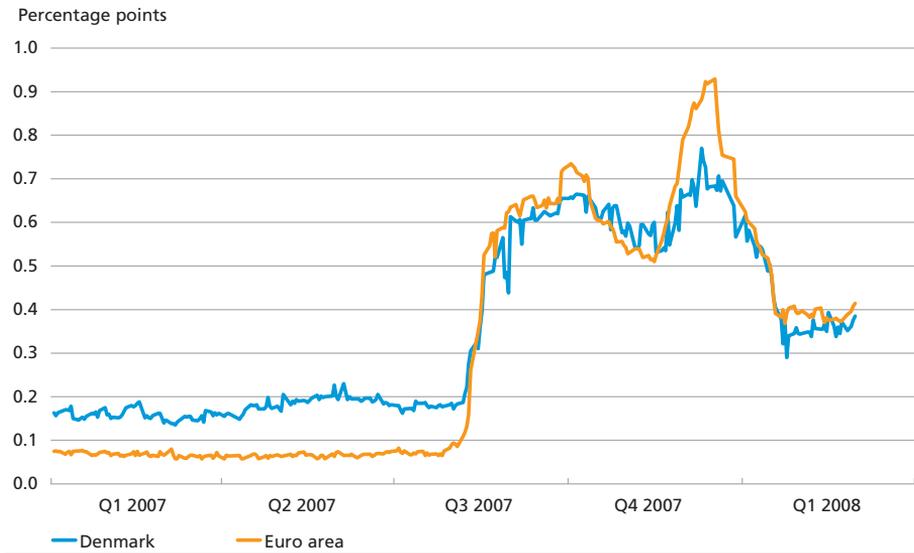
## **THE DANISH ECONOMY: MONETARY AND EXCHANGE-RATE CONDITIONS**

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The Danish krone has been stable around its central rate in ERM II. Tensions in the euro area money market meant that the short-term yield spread to the euro area was narrow in December, while there was a forward discount for trading euro against kroner, as opposed to the forward premium usually applicable to such trading. This caused the krone to weaken somewhat up until Christmas. The weakening coincided with considerable net capital outflows, primarily purchase of foreign bonds by Danish residents and sale of Danish bonds by non-residents. Danmarks Nationalbank intervened in the foreign-exchange market to purchase kroner against foreign exchange for around kr. 12 bil-

## SPREAD BETWEEN UNCOLLATERALISED AND COLLATERALISED 3-MONTH INTEREST RATES

Chart 9



Note: Spread between 3-month Cibur and repo rate for Denmark and between 3-month Euribor and repo rate for the euro area.

Source: Danmarks Nationalbank and EcoWin.

lion. The krone strengthened slightly from the end of December when forward rates in the foreign-exchange market normalised. In January, Danmarks Nationalbank purchased foreign exchange for just under kr. 8 billion in order to stabilise the krone. The foreign-exchange reserve was kr. 180.3 billion at end-February.

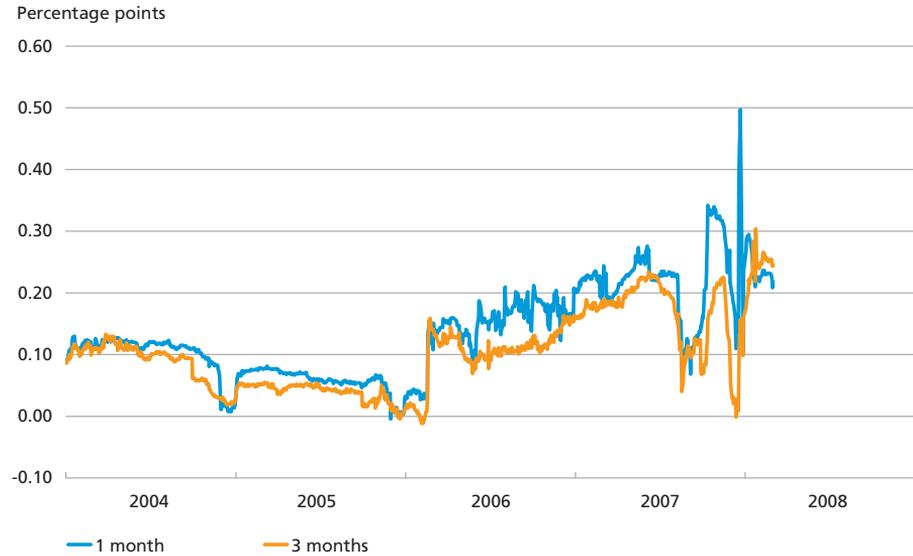
The yield on 10-year Danish government bonds has declined by 0.2 percentage point since December, to 4.0 per cent at the beginning of March. In the same period, the maturity-adjusted yield spread between 10-year Danish and German government bonds widened to around 0.15 percentage point.

During the international financial turmoil in the 2nd half of 2007, the longer-term uncollateralised money-market interest rates in both Denmark and the euro area rose considerably in relation to the collateralised money-market interest rates, cf. Chart 9. Since the turn of the year, money-market tensions have subsided, and the spread between the collateralised and uncollateralised money-market interest rates has narrowed.

The spread between uncollateralised money-market interest rates in Denmark and the euro area for various maturities has been highly volatile in the period since August 2007, cf. Chart 10. As in many previous years, the spread narrowed significantly over year-end. Money-market interest rates in the euro area usually rise around New Year. Subse-

**SPREAD BETWEEN UNCOLLATERALISED MONEY-MARKET INTEREST RATES  
IN DENMARK AND THE EURO AREA**

Chart 10



Note: The uncollateralised money-market interest rates are 1-3-month Cibur for Denmark and 1-3-month Euribor for the euro area. Daily observations.

Source: Danmarks Nationalbank.

quently spreads between uncollateralised money-market interest rates in Denmark and the euro area have returned to a level of 0.25 percentage point, corresponding to the difference between monetary-policy interest rates.<sup>1</sup>

The banks' interest rates on corporate lending increased by 0.2 percentage point in the 2nd half of 2007. The reason was that part of the banks' lending is linked to the uncollateralised money-market interest rates, which soared in connection with the international financial turmoil. In early 2008 several banks announced that they were raising lending rates by 0.25 percentage point, referring to higher financing costs in the money and capital markets. Higher financing costs have also intensified competition for deposits. A few banks have raised their deposit rates, while others have introduced new deposit types.

Overall growth in lending by banks and mortgage-credit institutes, which was 12.6 per cent year-on-year at the end of January, cf. Chart 11, has been declining since the beginning of 2007. The moderation has been most pronounced for lending to households, mirroring the slightly lower growth in private consumption.

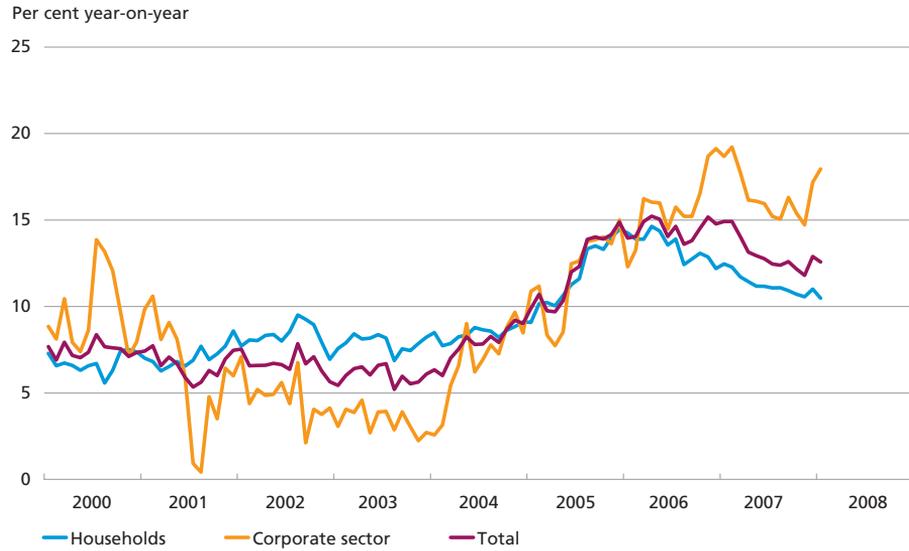
<sup>1</sup> For a more detailed description of the financial turmoil and central banks, see Morten Kjærgaard and Lars Risbjerg, *Financial Turmoil, Liquidity and Central Banks*, in this publication.

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**TOTAL GROWTH IN LENDING BY BANKS AND MORTGAGE-CREDIT INSTITUTES**


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Chart 11



Note: Including lending by foreign units of Danish banks. Adjusted for the inclusion of FIH in the balance-sheet statistics for banks since January 2003. The corporate sector includes financial undertakings (except MFIs). The total includes the public sector and lending not broken down by sector.

Source: Danmarks Nationalbank.

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**THE DANISH ECONOMY: REAL ECONOMY**


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**Economic activity and the housing market**

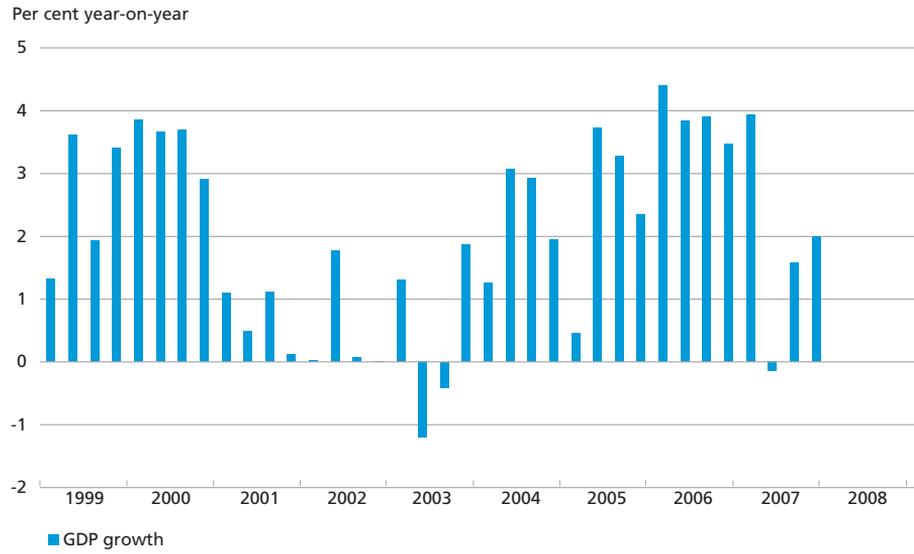
Growth in the Danish economy is declining, cf. Chart 12. There are indications of a dampening of demand pressure, but nevertheless the economy remains at its capacity limit with resultant pressure on the labour market. The shortage of labour is expected to peak in 2008 and then to ease in step with falling demand. Growth will continue to be determined by supply-side factors, i.e. the development in the labour force and in productivity. This entails a slowdown in economic growth in the coming years, cf. Table 1 on p.2.

The pressure on the economy has resulted in a strong increase in the propensity to import and a rapidly decreasing current-account surplus in the last few years. In recent quarters the rate of wage increase and domestic price pressures have risen, reflecting the normal pattern whereby prices and wages react with a considerable lag to cyclical developments. This also applies in connection with downturns, which may be deep and long if the level of costs has become too high in relation to that of Denmark's foreign competitors.

GDP at constant prices grew by 0.4 per cent in the 4th quarter, while full-year growth was 1.8 per cent. Consumption and investments rose at a faster rate than GDP in the 4th quarter. The reason why overall

GROWTH IN DANISH GDP AT CONSTANT PRICES

Chart 12



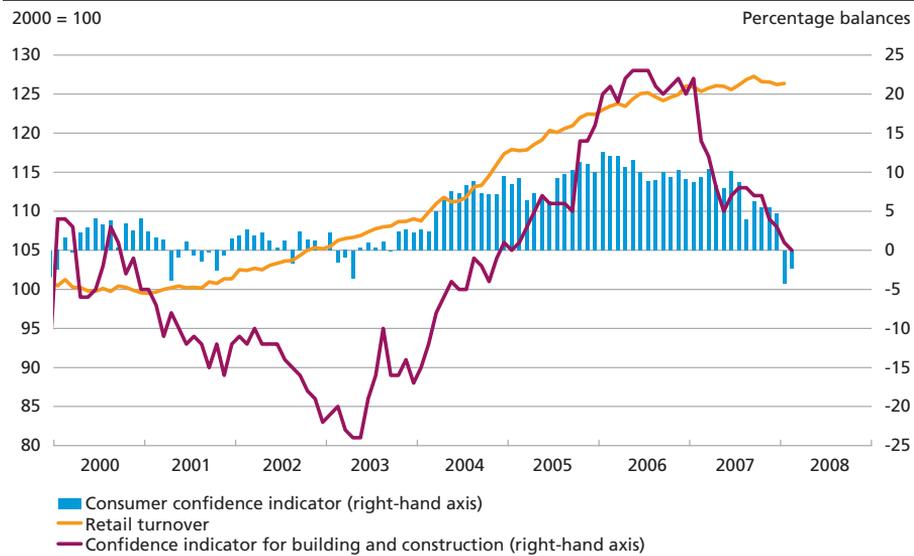
Source: Statistics Denmark.

growth was nevertheless modest was that demand was to a large extent aimed at foreign products. Imports of goods and services increased by 3.3 per cent, while inventory investments declined substantially.

The confidence indicator for building and construction showed a downward trend in the 2nd half of 2007, cf. Chart 13. The share of con-

RETAIL TURNOVER INDEX AND CONFIDENCE INDICATORS

Chart 13



Note: Seasonally adjusted consumer confidence. Retail turnover is a 3-month moving average.  
Source: Statistics Denmark and own calculations.

struction enterprises reporting labour shortages has declined, but still exceeded 25 per cent at the turn of the year. Building and construction is one of the most cyclically sensitive sectors of the economy and thus one of the first to feel the impact of a slowdown.

Residential investments have been stable since 2006. This marks the end of a period of virtually uninterrupted growth since 1993, combined with rising real cash prices for owner-occupied housing, which trebled over the period.

Against the backdrop of strong economic growth with robust earnings and mounting capacity pressure, business enterprises have increased their investments substantially since 2004, but the rate of growth subsided in 2007. Particularly investments in machinery and software have been high. The elevated investment level in relation to output entails a higher capital-to-worker ratio. This development has been accelerated by the shortage of labour, but is also important if the Danish wage level, which is high in an international context, is to be maintained. That is only possible if productivity is high in Denmark.

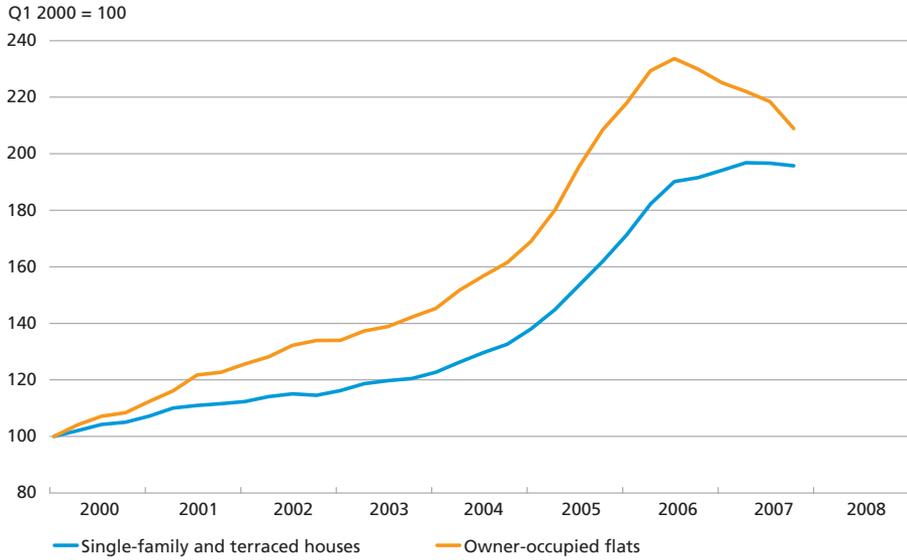
Private consumption grew by 2.5 per cent in the 4th quarter of 2007 and by 2.7 per cent for the full year, i.e. at a lower rate than in the preceding years. The slowdown is accentuated by factors such as consumer confidence, which fell towards the end of the year and was negative in January for the first time since the upswing started in 2003. The primary reason is increased concern about Denmark's economic prospects, presumably partly on account of the financial turmoil.

From the peak in October 2007 until the end of February the households have lost an estimated kr. 250 billion on share portfolios, equivalent to approximately 7 per cent of their total wealth. The price drop follows a period of considerable growth in wealth. The estimated consumption effect of the declining share portfolios is sizeable, but not dramatic. Calculations using Danmarks Nationalbank's macroeconomic model show that, viewed in isolation, losses of this magnitude can dampen the development in private consumption by 1 per cent over a 2-year horizon. The GDP impact is more modest, approximately 0.25 per cent over a 2-year horizon, since imports account for a large share of the adjustment. If the level of interest rates, which has fallen by approximately 0.25 percentage point over the same period, is taken into account, the effect of the lower share prices on private consumption is less pronounced, and the decline in GDP growth is virtually zero.

Apart from share prices, the primary factor affecting household wealth is the price of housing. According to the statistics of the Association of Danish Mortgage Banks, single-family houses have risen only slightly in recent quarters, while owner-occupied flats have fallen by al-

DEVELOPMENT IN CASH PRICES FOR OWNER-OCCUPIED HOUSING

Chart 14



Note: The most recent observations are from the 4th quarter of 2007.

Source: Association of Danish Mortgage Banks.

most 10 per cent over the last year, cf. Chart 14. Price developments are subject to considerable regional differences. The dampening of the housing market is also reflected in sales of owner-occupied homes, which were lower in the 4th quarter of 2007 than previously. At the same time, the number of homes for sale is high.

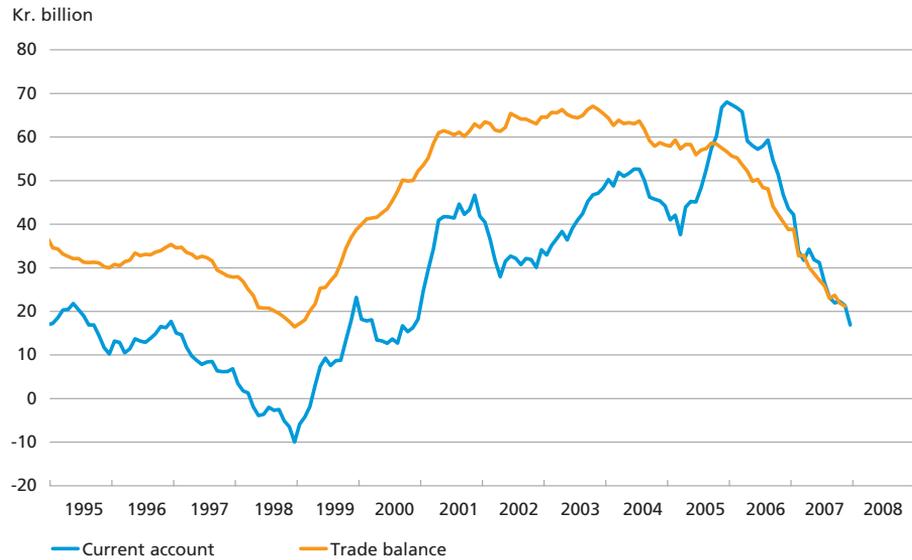
In general, the finances of the households are sound, and combined with good employment opportunities this means that the households are resilient to the slowdown in the housing market and the global decrease in share prices. This is underlined by the fact that the number of foreclosures remains low. The propensity to consume has risen only slightly in recent years. To the extent that home equity has been mortgaged, the proceeds have in many cases been used to reduce other debt, boost pension savings or improve the home.

### Foreign trade and balance of payments

A shortage of domestic production capacity means that an increasing share of demand must be met by foreign production, which has reduced the trade and current-account surpluses. In 2007, the current-account surplus was down to kr. 17 billion, from almost kr. 70 billion in 2005, cf. Chart 15. Particularly the balance of goods, which includes bunker costs for the large Danish merchant fleet, has deteriorated. Bunker costs rose from kr. 19 billion in 2005 to kr. 33 billion in 2007.

TRADE AND CURRENT-ACCOUNT BALANCES

Chart 15



Note: 12-month sums. Trade balance excluding ships, etc. The most recent observations are from December 2007.  
Source: Statistics Denmark.

The sustained external surplus in the current cyclical phase is primarily attributable to North Sea oil and gas production, as well as a considerable expansion of the merchant fleet. Viewed in isolation, both contribute to the current-account surplus with relatively limited input of Danish production resources.

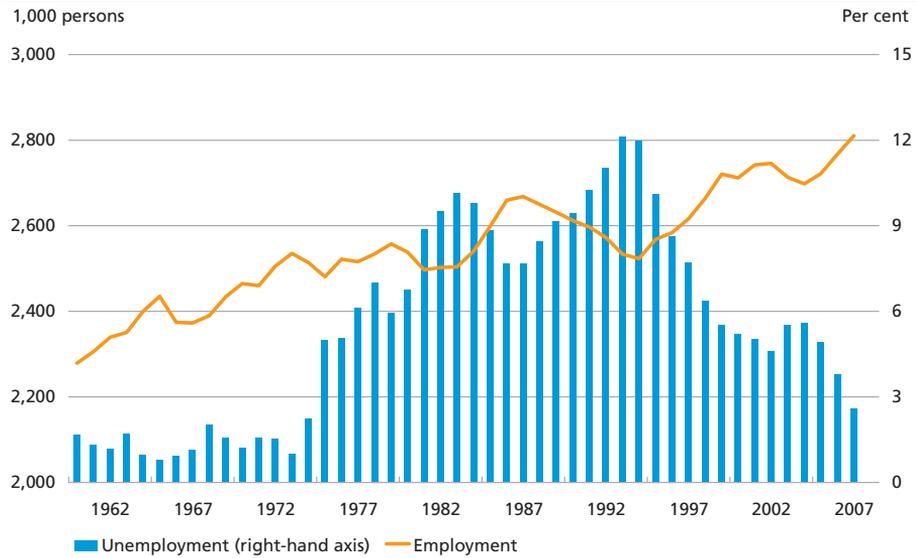
### Labour market and wages

According to the national accounts, seasonally adjusted employment grew by 11,000 from the 3rd to the 4th quarter of 2007, to an all-time high of more than 2.8 million persons. Growth in employment has exceeded the decline in unemployment, which means that the labour force has increased, despite a decline in the age groups from which the labour force is mainly recruited. A major reason has been an influx of foreign labour.

Statistics Denmark has changed its method for compilation of unemployment figures, which has reduced unemployment by 0.5 percentage points in relation to the previously published figures. The labour statistics have been revised backwards to April 2000 using the new method. The overall picture remains the same: unemployment has been steadily declining, to 2.1 per cent of the labour force in January. This is the lowest rate of unemployment in Denmark since the early 1970s, cf. Chart 16. Unemployment is now well below the structural level that is

EMPLOYMENT AND UNEMPLOYMENT

Chart 16



Note: Employment stated on the basis of the national accounts. A break in the unemployment series occurs in 2001.  
Source: Statistics Denmark.

compatible with a balanced economy, cf. Box 2, which means that a certain increase in unemployment is necessary to ease the capacity pressure and prevent wages and prices from accelerating.

Confidence indicators show that a pronounced shortage of labour still exists in the construction sector and in industry, although the situation has improved a little in recent months. Other parts of the economy also have problems filling vacant positions, e.g. the public sector. The number of jobs advertised on the Internet is high, so even if the economy is set to cool down, the labour market will remain tight.

The squeezed labour market has triggered a wage response. In recent quarters the rate of wage increase has risen, to 4.3 per cent year-on-year in the 4th quarter of 2007, from 4.0 per cent in the preceding quarter according to Statistics Denmark. At 5.2 per cent, the rate of wage increase in building and construction was among the highest. The new collective agreements for employees in central government and parts of local government and in the financial sector, which have now been concluded, but not yet adopted, entail wage increases in the range of 13 per cent over three years. For the public sector, a large part of the increase is in the early part of the agreement period.

### Competitiveness

Denmark's competitiveness has weakened substantially since 2000 on account of several factors: strengthening of the krone vis-à-vis a number

## STRUCTURAL UNEMPLOYMENT

Box 2

Structural unemployment reflects the level of unemployment that is compatible with stable wage and price developments a few years ahead. When actual unemployment is equal to structural unemployment, the labour market is thus in balance, entailing a stable development in wages at a level corresponding to growth in productivity plus the 2-per-cent inflation which signals price stability. Structural unemployment is closely related to the concepts of natural unemployment and NAIRU (Non-Accelerating Inflation Rate of Unemployment).

When unemployment falls below structural unemployment this will, all other things being equal, lead to accelerating wage increases, whereas unemployment above the structural level leads to lower wage increases. The wage response is, however, normally lagged, one reason being that many wages are only adjusted in connection with collective bargaining. If low unemployment leads to wage increases that are not matched by higher productivity, manufacturers will at some point have to raise their output prices, whereby price developments are affected by labour-market imbalances.

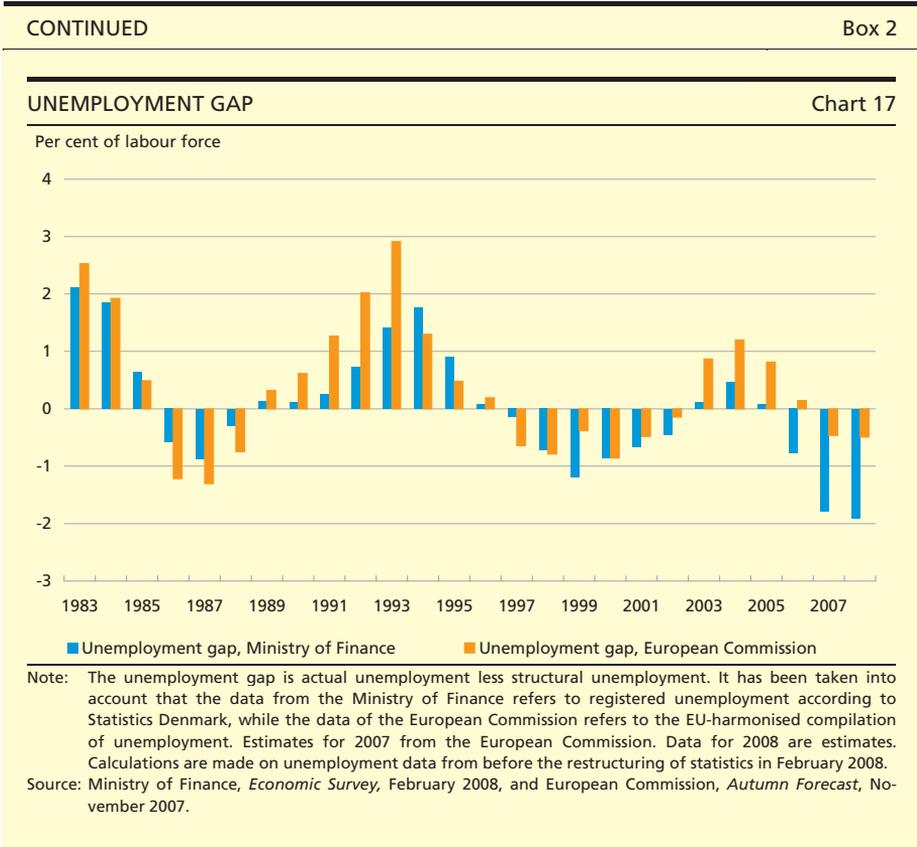
The wage response to fluctuations in unemployment around its structural level is asymmetrical since wage acceleration in periods of lower actual unemployment typically exceeds wage moderation in periods of higher actual unemployment. In other words, the more unemployment falls below its structural level, the greater the risk that a protracted period of high unemployment is required in order to restore competitiveness.

Structural unemployment is determined by institutional conditions, mainly in the labour market, and experience from the 1990s shows that it is possible to reduce structural unemployment through reforms, e.g. by reducing the period of entitlement to cash benefits and speeding up activation. Structural unemployment is not directly observable, but is regularly estimated by the Ministry of Finance<sup>1</sup>, the European Commission and the OECD, among others. Such calculations are naturally subject to considerable uncertainty and the estimates are revised from time to time.

The difference between actual and structural unemployment – the unemployment gap – is important in relation to the planning of economic policy, but is not the only factor to be taken into account. In a situation when unemployment is falling it is difficult to say whether structural unemployment has also fallen or whether the unemployment gap has changed. In theory it is possible to distinguish between the two situations by examining whether or not wage increases have accelerated, but in practice this is not possible due to the lagged wage response. Consequently, there is a risk that economic policy is not tightened in time if a decline in unemployment is initially misinterpreted as an expression of falling structural unemployment.

In the current situation there is consensus that actual unemployment is lower than structural unemployment, although the estimates of e.g. the Ministry of Finance and the European Commission are far apart, cf. Chart 17. According to the Ministry, the pressure on the labour market is the strongest for 25 years, and the Ministry does not expect the unemployment gap to narrow in 2008 compared with 2007.

<sup>1</sup> The Ministry's calculation of structural unemployment is described in Appendix 2.2 of the Financial Report 2004 (*Finansredøgørelse* – in Danish only).



of currencies; higher wage increases in Denmark than in competitor countries; and weaker productivity development in Denmark than abroad.

Firstly, the Danish krone has strengthened, particularly against the US dollar, the Japanese yen and the pound sterling. Its appreciation against these currencies far exceeds its depreciation against a number of Eastern European currencies, cf. Table 2.

The effective krone rate is calculated using weights determined on the basis of trade in goods. If trade in services is included, the krone has strengthened even more over this period, since the dollar has a greater weighting in the index including services<sup>1</sup>.

Secondly, Danish industrial wages have increased at a faster pace than those of Denmark's competitors every year since the mid-1990s. An index of wage developments abroad and in Denmark, expressed in the same currency, has thus fallen more than the strengthening of the krone would warrant, cf. Chart 18.

<sup>1</sup> Cf. Erik Haller Pedersen, *The Effective Krone Rate and Trade in Services*, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2007.

**FACTORS CONTRIBUTING TO THE STRENGTHENING OF THE EFFECTIVE KRONA RATE**

Table 2

Index points	Q1 2000 - Q4 2007	Q3 2004 - Q4 2007
Euro .....	-0.13	-0.16
Swedish krona .....	0.84	0.34
Pound sterling .....	1.37	0.40
Czech koruna, Polish zloty and Hungarian forint ...	-0.49	-0.49
US dollar .....	2.92	1.35
Japanese yen .....	2.17	0.73
Chinese renminbi and Hong Kong dollar .....	...	0.32
Other currencies .....	0.62	-0.11
<b>Total change in effective krona rate .....</b>	<b>7.30</b>	<b>2.38</b>

Note: In the calculation of the effective krona rate, a set of weights is applied based on trade in industrial goods. The weights were changed as from 1 October 2004, when China and Hong Kong were included, bringing the total to 27 countries. Viewed in isolation, an increase in the effective krona rate implies weaker competitiveness.

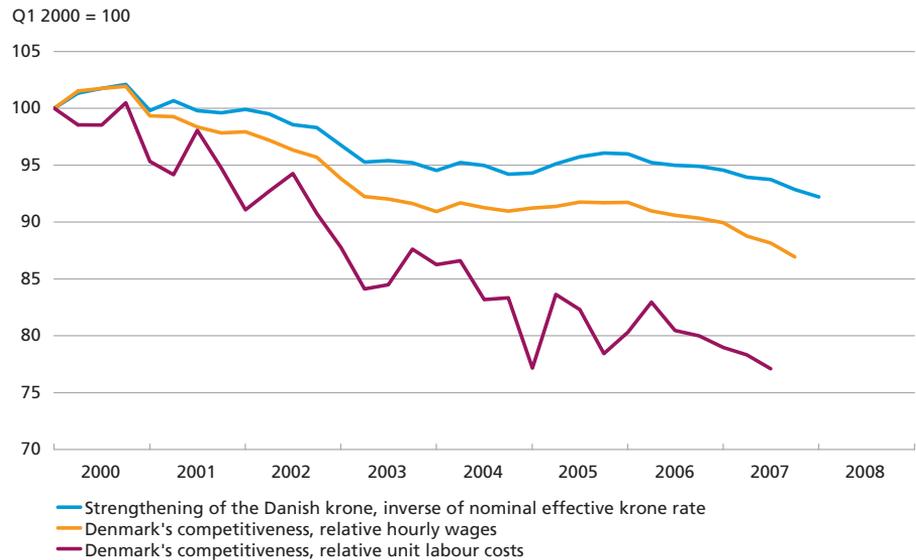
Source: Danmarks Nationalbank.

Thirdly, industrial productivity has improved less in Denmark than in competitor countries in recent years, which means that Denmark's competitiveness in terms of unit labour costs has deteriorated even further.

The trend is particularly strong in a broader perspective, but less pronounced in relation to the euro area member states. In the same period, the price of Danish industrial production grew more rapidly than that of the euro area, but slightly slower than unit labour costs, indicating a

**UNDERMINING OF DENMARK'S COMPETITIVENESS**

Chart 18



Note: Relative wages and unit labour costs are measured as foreign wages and unit labour costs, respectively, over the corresponding figures for the Danish economy, converted into the same currency. A falling index thus indicates deterioration of Denmark's competitiveness.

Source: OECD and Statistics Denmark.

small increase in labour costs as a share of value added. Calculations of productivity development, and thus of unit labour costs, are subject to considerable uncertainty.

In spite of the deterioration in competitiveness, strong growth in Denmark's export markets has boosted exports in terms of both current prices and volumes. This applies even if energy is disregarded. Wage competitiveness is not the only factor determining the degree of success in export markets. Denmark has to some extent lost market shares, but that is natural during a strong domestic boom with good sales opportunities in the domestic market. The undermining of Denmark's competitiveness will really be felt when the international boom subsides. In that situation it may be difficult for business enterprises to find foreign alternatives to the domestic market if Danish products are too highly priced. Consequently, it may be necessary – in order to restore competitiveness – for unemployment to rise to a level above that which is necessary to ensure a balanced economy in the long term.

### **Prices**

The Harmonised Index of Consumer Prices, HICP, rose by 3.0 per cent in January. That is quite a leap compared with the development in the autumn, and the highest increase since the beginning of 2003. The acceleration is mainly attributable to higher energy and food prices. The latter rose by 5.9 per cent year-on-year, and since they account for almost 20 per cent of HICP, such an increase is clearly reflected in the overall index, as is also the case abroad. The year-on-year increase in energy prices was 8.3 per cent in January.

Domestic market-determined inflation, IMI, has been rising from a low level since the end of 2004, to 1.3 per cent in January. The IMI index is more sensitive to the cyclical situation in Denmark than the HICP index, and the rise in IMI reflects factors such as the tighter labour market. The existence of underlying inflationary pressures is also reflected in large price increases for Danish wholesale goods, industrial products and building materials during 2007.

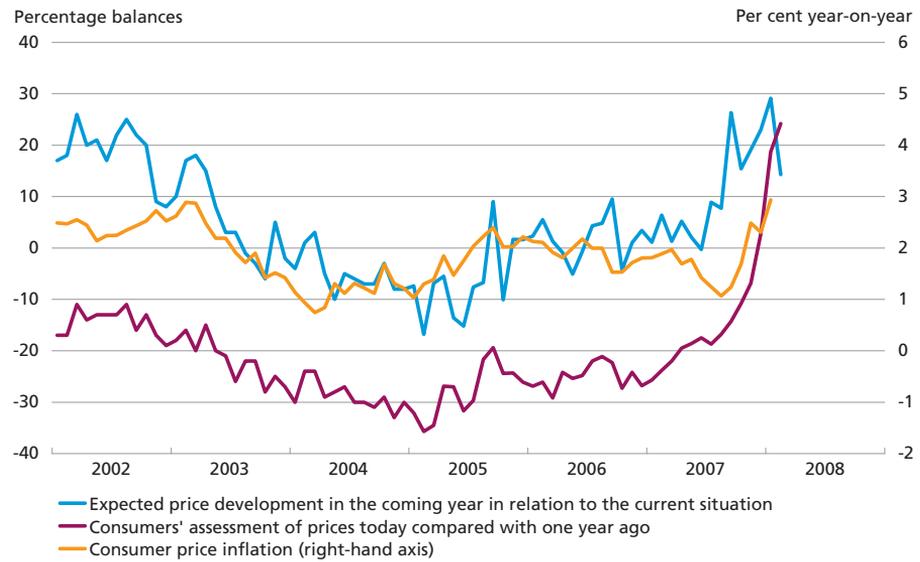
The higher prices have not gone unnoticed by consumers. There is widespread sentiment that prices have risen, and moreover they are increasingly expected to continue their upward trend in the coming year, cf. Chart 19.

### **Economic policy**

Government finances have a strong automatic stabilising impact on the Danish economy. For example, expenditure for unemployment benefits increases with the rate of unemployment. This is one of the reasons why

ACTUAL AND EXPECTED PRICE DEVELOPMENTS

Chart 19



Note: A rising percentage balance indicates that more and more respondents say that the price level has increased over the last year or that they expect further increases within the coming year.

Source: Statistics Denmark.

active fiscal policy in the form of economic intervention is seldom required. Nevertheless, it is an advantage if fiscal policy contributes to dampening output when the latter exceeds the potential of the economy, i.e. the maximum output that is compatible with stable wage and price developments over a few years.

In recent years, the fiscal-policy stance has changed. While in the 1980s and 1990s fiscal policy was counter-cyclical, i.e. aimed at smoothing fluctuations in GDP, it has for some years been pro-cyclical, cf. Box 3. Fiscal policy affects GDP not only within the current year, but also several years into the future. A compilation based on data from the Ministry of Finance shows that the fiscal policy conducted since 2002 has contributed substantially to the strong capacity pressure on the economy in recent years. Fiscal policy has thus been an underlying factor of the current labour-market squeeze.

Because of the general election in the autumn of 2007 the Danish government did not present its Finance Bill 2008 until the beginning of February. The fiscal stance whereby government finances have an expansionary impact on the economy will be upheld in 2008, amidst pronounced labour shortages and clear signs of overheating of the Danish economy, e.g. high rates of wage increase.

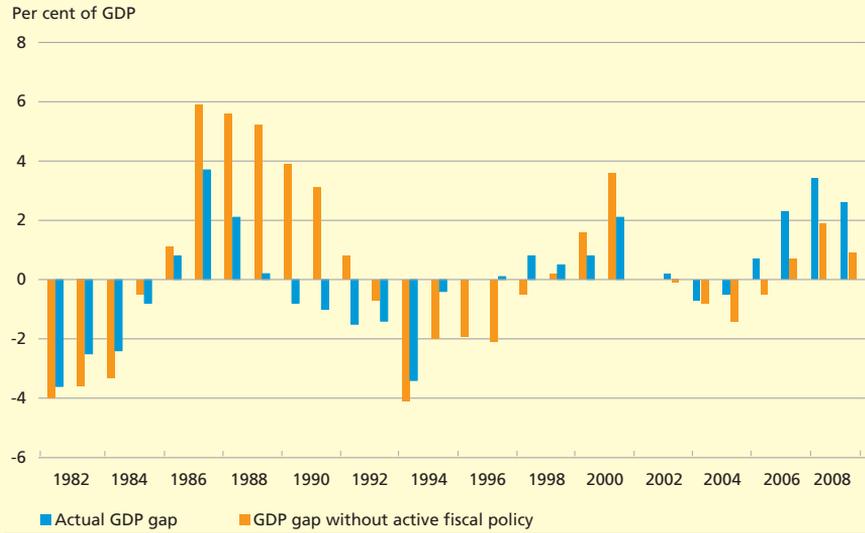
FISCAL POLICY AND ECONOMIC CYCLES

Box 3

Capacity pressure on the economy can be quantified by determining actual GDP in relation to potential GDP, i.e. an estimate of the maximum output volume that will not lead to pressure on the labour market. In the most recent Economic Survey, this GDP gap is calculated at 2.5 per cent in 2008. An aggregation of the multi-annual fiscal effects shows that fiscal policy since 2002 has increased GDP by 1.7 per cent. A substantial part of the current GDP gap is thus attributable to an expansionary fiscal policy in this period.

ACTUAL AND POLICY-ADJUSTED GDP GAPS

Chart 20



Note: GDP gaps with and without an active fiscal policy for the period 1981-2000 are derived from the Financial Report 2000 (in Danish only), the actual GDP gap being represented by the OECD's current calculation, while the assessment of fiscal policy in the years 2001-08 has been based on various volumes of the Economic Survey.

Source: Ministry of Finance, OECD and own calculations.

The stabilising effect of fiscal policy can be illustrated by eliminating the fiscal effect from the GDP level and relating the resulting "policy-purged" GDP to potential GDP. The outcome is the GDP gap, had fiscal policy been neutral. Chart 20 shows that actual GDP gaps in recent years have been wider than the GDP gap without an active fiscal policy, 2004 being an exception. This means that fiscal policy has amplified the upswing. In the period 1980-2000 it was the other way round. Fiscal policy helped to smooth GDP developments, as reflected in the fact that in this period the blue bars are closer to zero than the orange ones.

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# The Danish Economy 2008-10

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## INTRODUCTION AND SUMMARY

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This article reviews Danmarks Nationalbank's forecast for the Danish economy in the years 2008-10. The forecast has been made using the macroeconomic model *Mona*<sup>1</sup> and is based on available economic statistics, including Statistics Denmark's quarterly national accounts for the 4th quarter of 2007<sup>2</sup>.

Economic growth in Denmark was lower in 2007 than in the preceding three years. After weak development in the 1st half of 2007, growth picked up again in the 2nd half, resulting in an overall increase in GDP by 1.8 per cent in 2007 compared with 2006. The slowdown in growth – primarily attributable to supply-side factors such as labour shortage and pressure on the capital stock – is expected to continue in the coming years. Growth is estimated to be 1.9 per cent in 2008, partly buoyed up by the strong growth in the 2nd half of 2007, and to decline to 1.0 per cent in 2009 and 0.4 per cent in 2010, cf. Table 1.

The growth estimate for 2008 is generally in line with the prospects for the USA and the euro area, cf. Chart 1. The slowdown in the Danish economy thus mirrors the dampening of international growth, particularly in the affluent Western economies. Denmark has been ahead of the euro area, but behind the USA in the economic cycle. The capacity pressure is lower in the latter two economic regions, paving the way for some recovery in 2009, while growth in Denmark is expected to decline in the coming years. The increase in domestic demand is expected to be close to zero in 2010.

As a result of recent years' economic growth, employment has risen to a record-high level, and unemployment has fallen steadily to the lowest level for more than 30 years. Despite the inflow of foreign labour and an increasing participation rate, the pressure on the Danish labour market is severe, and the unemployment rate is well below the level that is compatible with wage and price stability. There is a large output

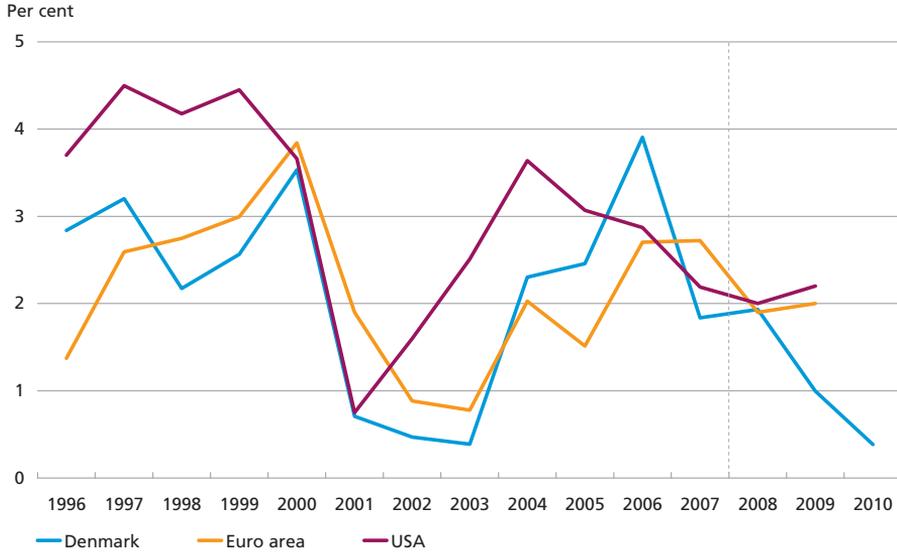
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<sup>1</sup> The model is described in *MONA – a quarterly model of the Danish economy*, Danmarks Nationalbank, 2003.

<sup>2</sup> The calculations are based on statistical information up to and including 29 February 2008.

GDP GROWTH IN DENMARK, THE EURO AREA AND THE USA

Chart 1



Note: Estimates after the broken line.

Source: Statistics Denmark, EcoWin, OECD Economic Outlook, no. 82, December 2007, and own forecast.

gap, i.e. the gap between actual GDP and GDP in a scenario with normal utilisation of production resources.

Growth in demand fell in 2007 from the high level in the preceding years. The decrease reflected weak development in the 1st half of 2007 and a subsequent recovery in the 2nd half. The trend was most pronounced in exports, although growth in domestic demand also declined.

KEY ECONOMIC VARIABLES

Table 1

Real growth on previous year, per cent	2007	2008	2009	2010
GDP .....	1.8	1.9	1.0	0.4
Private consumption .....	2.7	3.0	1.4	0.8
Public consumption .....	1.3	2.3	1.6	1.3
Residential investments .....	4.4	-2.8	-2.1	-4.6
Public investments .....	-13.6	7.0	5.4	4.6
Business investments .....	10.6	7.9	-0.1	-3.0
Inventory investments <sup>1</sup> .....	-0.2	-0.1	-0.3	-0.4
Exports .....	3.7	3.2	2.6	3.3
Industrial exports .....	5.3	2.8	4.1	5.2
Imports .....	6.1	5.5	2.2	2.1
Consumer prices, per cent year-on-year .....	1.7	3.3	2.4	2.0
Unemployment <sup>2</sup> , 1,000 persons .....	76.7	54.9	65.7	95.2
Balance of payments, per cent of GDP .....	1.0	0.1	0.4	1.0
Government balance, per cent of GDP .....	4.5	3.8	2.9	1.9
Hourly wages, per cent year-on-year .....	4.0	4.8	4.8	4.2

<sup>1</sup> Contribution to GDP growth.

<sup>2</sup> Statistics Denmark has restructured the unemployment statistics. Unemployment is compiled according to the new definition. However, the calculations are based on observations according to the old definition, converted by deducting 16,000 persons, i.e. the average difference for 2007 as a whole.

The projection assumes continued dampening, especially of domestic demand, but also reduced export growth as a result of lower growth in export markets and weaker competitiveness. Consequently, the output gap is expected to narrow in 2009 and 2010, but to remain positive.

Recent years' strong capacity pressure has resulted in a higher import ratio and weakened the balance of payments. Both the rate of wage increase and price inflation rose during 2007. In accordance with the normal pattern, this has taken place late in the economic cycle. The lag also emphasises that wage and price pressures and the consequent deterioration of competitiveness may continue for some time after a cyclical reversal. The weaker international cyclical position, which dampens export-market growth, will make higher demands on competitiveness. At the same time, the risk associated with the international cyclical development is assessed to be asymmetrical, with the possibility of a more pronounced slowdown in the USA and a stronger spill-over effect on Europe and the rest of the world, cf. Box 1.

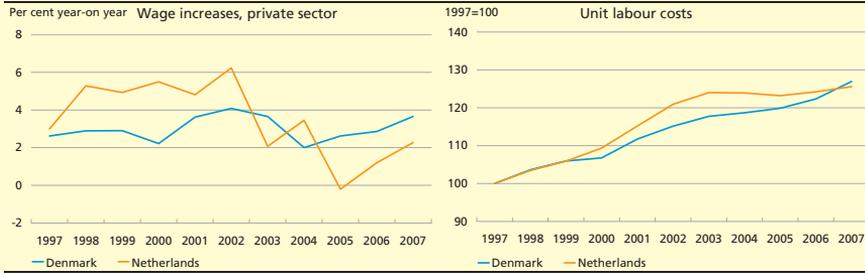
RISKS	Box 1
<p>The capacity pressure on the Danish economy remains strong. GDP growth declined in 2007, but since it did not fall below the rate of potential growth, the output gap has not narrowed. The pressure on the labour market is sustained and employment has fallen month by month to a very low level. The risk of high wage increases that are not related to productivity growth, but to labour shortage, thus persists. The implication is further weakening of competitiveness, which will result in weaker export development. This will imply a longer adjustment period with unemployment above the structural level, wage moderation and recovery of competitiveness.</p> <p>The international economic outlook has weakened since the previous forecast in September. At the same time, the risk outlook is assessed to be asymmetrical – the risk of a severe downturn is greater than the prospect of economic growth correspondingly above the estimate. More specifically, there is a risk of stronger-than-expected slowdown in the USA and more pronounced spill-over effects on Europe and the rest of the world. This scenario clearly implies weaker growth in Denmark's export markets. Lower market growth will diminish export growth and lead to deterioration of the balance of payments. The extent of the negative effect on GDP growth in Denmark and the increase in unemployment will depend on the scale of the international downturn. In view of the normally lagged wage adjustment process, competitiveness will remain weak. Together with low or negative export-market growth, this will be an unfortunate combination that may entail unemployment above the structural level for a prolonged period.</p> <p>The lessons learned by the Netherlands after the boom in the 2nd half of the 1990s can illustrate the risk. The rate of wage increase in the Netherlands rose significantly in 1998, cf. Chart 2 (left), when unemployment had dropped to around 4 per cent. The strong wage dynamics in the following years were not sufficiently supported by productivity increases, which caused unit labour costs to rise by around 20 per cent from 1997 to 2002, cf. Chart 2 (right).</p>	

CONTINUED

Box 1

WAGE DEVELOPMENT, DENMARK AND THE NETHERLANDS

Chart 2



Source: OECD, Economic Outlook, no. 82, December 2007.

Competitiveness in the Netherlands had thus weakened when the international economic slowdown occurred after the millennium rollover. The Dutch economy was hard hit by the recession, and unemployment rose by around 2.5 percentage points from 2001 to 2004. For comparison, unemployment in Denmark rose by 1 percentage point in the same period, also measured in terms of the EU-harmonised definition. Wages in the Netherlands responded to the unemployment growth with a lag – the rate of wage increase grew to more than 6 per cent in 2002, but subsequently decreased. In 2005 the rate of wage increase was zero, corresponding to a drop in real wages. As a result of the low rate of wage increase in recent years, unit labour costs have been virtually unchanged since 2003.

In Denmark, unit labour costs have risen generally every year since 1997, and, according to OECD observations, Denmark and the Netherlands overall showed similar levels of growth in costs, i.e. 25 per cent, for the last decade.

The revisions of the forecast compared with the September 2007 forecast are described below, followed by a more detailed review of the forecast, including its underlying assumptions.

**REVISIONS IN RELATION TO THE PREVIOUS FORECAST**

The estimates of GDP growth in 2008 and 2009 have been adjusted downwards slightly compared with the September 2007 forecast, cf. Table 2. This reflects weaker development in exports as a result of lower market growth and the appreciation of the effective krone rate. At the same time, domestic demand declines at a slightly faster pace due to such factors as reduced growth in real disposable incomes as a result of consumer price inflation. Recent months have seen a stronger-than-expected drop in unemployment, which has led to slightly higher pressure on the labour market at the outset of the forecast period, but this projection also operates with rising unemployment from the 2nd half of

REVISIONS IN RELATION TO THE PREVIOUS FORECAST Table 2

	Actual	This forecast			Previous forecast		
	2007	2008	2009	2010	2007	2008	2009
GDP, per cent year-on-year	1.8	1.9	1.0	0.4	1.9	2.1	1.3
Unemployed <sup>1</sup> , 1,000 persons	76.7	54.9	65.7	95.2	79.4	69.9	80.3
Balance of payments, kr. billion .....	16.9	1.8	6.4	19.2	24.8	26.6	40.8
HICP, per cent year-on-year	1.7	3.3	2.4	2.0	1.6	2.4	2.4

Note: The previous forecast was published in September 2007.

<sup>1</sup> Unemployment compiled according to the new definition in both forecasts, cf. note 2 to Table 1.

2008. The current-account surplus has been adjusted downwards in the light of the stronger-than-expected deterioration towards the end of 2007, and weaker export growth.

The estimate of consumer prices in 2008 has been increased substantially, reflecting recent months' surging prices, not least food and energy prices. The projection maintains the current higher price level, but the forward-looking rates of increase are almost the same as in the previous projection.

## ASSUMPTIONS IN THE PROJECTION

The projection is based on a number of assumptions concerning the international economy, the financial conditions and fiscal policy, cf. Table 3.

FORECAST ASSUMPTIONS Table 3

	2007	2008	2009	2010
International economy:				
Export market growth, per cent year-on-year	7.9	6.9	6.4	6.3
Export market price, per cent year-on-year ..	0.4	1.0	1.9	2.0
Foreign price, per cent year-on-year .....	0.9	1.3	1.9	2.0
Foreign hourly wages, per cent year-on-year	2.7	3.0	3.1	3.2
Financial conditions, etc.:				
3-month money-market interest rate, per cent per annum .....	4.1	3.9	3.6	3.7
Average bond yield, per cent per annum .....	4.7	4.6	4.6	4.9
Effective krone rate, 1980=100 .....	103.2	105.4	105.5	105.5
Dollar rate, DKK per USD .....	5.4	5.0	4.9	4.9
Oil price, Brent, USD per barrel .....	72.7	97.0	96.2	95.2
Fiscal policy:				
Public consumption, per cent year-on-year ..	1.3	2.3	1.6	1.3
Public investment, per cent year-on-year .....	-13.6	7.0	5.4	4.6
Public-sector employment, 1,000 persons .....	826.8	831.0	833.3	835.6

**The international economy**

After several years of high global economic growth, a slowdown was observed, especially in the West, at the end of 2007. The slowdown can be attributed to e.g. the real-economic spill-over effect of the turmoil in the financial markets. The pace of the US economy has slackened, and there are several signs that the economic cycle has peaked in the euro area. Overall, the growth prospects for Denmark's largest export markets have deteriorated. Consequently, export-market growth in the projection has been revised downwards from the previous forecast, to a level close to the long-term average. The price increases on the Industrial export markets are expected to gain momentum, but remain modest in the forecast. This also applies to foreign price and wage increases.

**Interest rates, exchange rates and oil prices**

In the forecast, the development in short-term and long-term interest rates is based on the expectations that can be derived from the yield curves in the financial markets. In the projection the short-term interest rate will fall by approximately 0.75 percentage point until the beginning of 2009, and then rise a little. The forecast assumes a modest increase in the long-term interest rate from the current level.

For a number of years, the krone has strengthened gradually in relation to the currencies of Denmark's trading partners, particularly the dollar, entailing an increase in the nominal effective exchange rate of the krone. This trend has continued since the autumn of 2007, resulting in a higher initial effective exchange rate than in the previous forecast. In the projection, the dollar rate and the effective krone rate are assumed to be unchanged from the level at the end of February 2008.

The prices for oil and other commodities have increased, and at the end of February the oil price climbed to approximately 100 dollars per barrel. In the projection the oil price is assumed to follow futures prices, which are expected to decline a little from the current high level. As a result, the oil price is almost 35 per cent higher than in the September forecast.

**Fiscal assumptions**

The fiscal assumptions are based on the Finance Bill 2008 as presented in Economic Survey, February 2008, and in the recently concluded job-plan agreements. Growth in public consumption is expected to be 2.3 per cent in 2008, driven by higher expenditure for procurement of goods and services and more modest increases in the public sector's own production and employment. Growth in public consumption is higher than the estimate in Economic Survey, reflecting the normal tendency to ex-

ceed the target. Annual growth in public investments is expected to be 6 per cent on average in the forecast period. Overall, fiscal policy is expected to stimulate economic activity in 2008-10.

## **FORECAST FOR THE DANISH ECONOMY 2008-10**

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### **Output and employment**

Output grew by 1.8 per cent in 2007, in spite of the strong development in the 2nd half. This is the lowest annual output growth since 2003, and it is expected to dampen further in the forecast period. The dampening can be viewed as a natural reaction after recent years' output expansion. The current low level of unemployment and high capacity utilisation makes it difficult to maintain output growth. The capacity pressure is expected to peak this year and then ease a little as growth in demand recedes.

One of the signs of labour-market pressure is that unemployment is considerably lower than the structural level, cf. Box 2 on p.19. The forecast operates with a further decrease in unemployment in the coming months, albeit smaller than the monthly average of just over 2,000 persons observed in recent years. After the summer of 2008, unemployment will begin to rise slowly in response to the declining growth in demand. However, the unemployment rate will remain lower than the structural level until 2010. This underscores the very strong initial pressure, which is assumed to subside only slowly.

As a result of the demographic development, the supply of labour is assumed to fall by approximately 5,000 persons per year in 2008 and 2009 and slightly less in 2010. This contributes to sustaining the pressure on the labour market. The labour force has grown since 2005, despite the negative contribution from the demographic development. The reason is that favourable employment opportunities have attracted more people to the Danish labour market, including foreign labour. The positive contribution from favourable employment opportunities is nevertheless expected to decline, and the forecast operates with a fall in the labour force by 14,000 people in total from 2007 to 2010, cf. Table 4.

In view of the low rate of unemployment and declining labour force, productivity growth will be the determining factor for output growth in Denmark over the next few years. Productivity, measured as output per employee, rose by 0.2 per cent from 2006 to 2007, according to the available national accounts. In the projection, annual productivity growth is expected to rise again and approach the average level observed since 1990, i.e. approximately 1.8 per cent.

THE LABOUR MARKET				Table 4
1,000 persons, annual averages	2007	2008	2009	2010
Total employment .....	2,810	2,826	2,811	2,778
Of which private sector .....	1,984	1,995	1,977	1,942
Unemployed <sup>1</sup> .....	77	55	66	95
Labour force <sup>1</sup> .....	2,887	2,881	2,876	2,873

<sup>1</sup> Unemployment and the labour force are compiled according to the new definition of unemployment, cf. note 2 to Table 1.

The underlying development in the labour force and productivity points towards annual potential GDP growth of 1.6 per cent. Since actual GDP growth is expected to be lower than potential GDP growth in 2009 and 2010, the capacity pressure will subside.

The expected productivity growth masks a decrease in the number of employees and a small increase in output. Employment is assumed to fall by a total of 32,000 persons from 2007 to 2010 as the capacity pressure gradually subsides and business enterprises begin to adjust the number of employees to the lower growth in demand.

### Wages and prices

The very low and decreasing unemployment rate entailed higher wage increases throughout 2007, and the rate of wage increase is expected to rise further in 2008. This is supported by the 3-year collective agreements concluded in the central government area, parts of the local and regional government areas and the financial sector, in February and March 2008. The pressure on the labour market is expected to subside towards the end of the forecast period, and annual wage increases in the manufacturing sector will fall to around 4 per cent, cf. Table 5.

Wage increases in the euro area are expected to rise, albeit modestly, in the light of falling unemployment, and wage developments in Denmark's trading partner countries taken as one are expected to remain subdued in the coming years. Consequently, growth in hourly wages in industry will remain higher in Denmark than in other countries. In the projection this entails further deterioration of competitiveness and falling Danish export market shares.

WAGES, ETC. IN NON-AGRICULTURAL SECTOR				Table 5
Per cent year-on-year	2007	2008	2009	2010
Hourly wages .....	4.0	4.8	4.8	4.2
Hourly wage costs .....	4.4	4.9	4.8	4.1
Hourly productivity .....	1.0	0.4	1.7	1.9
Wage share, per cent of gross value added ....	65.8	67.6	67.6	67.5

Hourly wage costs are expected to mirror the development in wages. After weak growth in 2007 and 2008, productivity, measured as output per hour worked, is expected to grow by 1.5-2 per cent annually in 2009 and 2010. Since growth in hourly productivity is lower than growth in hourly wage costs, unit labour costs increase in the projection.

The increase in unit labour costs is not fully offset by higher prices for manufactured goods. The tendency in recent years towards a higher wage share thus continues in the forecast. A higher wage-earner share of total value added is normal when the pressure on the labour market is strong.

Price inflation has increased since the autumn of 2007, and in January 2008 annual consumer price inflation was 3.0 per cent in terms of HICP. The higher consumer price inflation is primarily attributable to a significant increase in energy and food prices. Domestic market-determined inflation, IMI, on the other hand, has been almost constant at around 1.3-1.4 per cent since October 2007, after increasing since the end of 2004. The development in IMI is normally weak when import and energy prices are rising because price increases are not fully passed on to consumers. Moreover, it should be noted that the calculated IMI fails to capture food price inflation if it is caused by rising wages and profits, as food prices are not included in IMI.

Notwithstanding the fact that the tendency towards rising domestic market-determined inflation has recently been curbed, the high payroll costs in combination with rapidly increasing wholesale prices for Danish goods and rising sales prices in industry, indicate a continued domestic price pressure.

In the coming months price inflation is expected to remain high on account of sustained high energy and food prices and higher price increases for imported goods and administered prices, cf. Table 6. The reduction of

CONSUMER PRICES						Table 6					
Per cent year-on-year	Weight <sup>1</sup>	2007	2008	2009	2010	2007 and 2008					
						Q4	Q1	Q2	Jan.	Feb.	Mar.
HICP .....		1.7	3.3	2.4	2.0	2.2	3.1	3.2	3.0	2.9	3.2
Index of net retail prices .....	100.0	1.9	3.6	2.6	2.2	2.6	3.3	3.7	3.4	3.2	3.4
Exogenous:											
Energy .....	7.1	0.5	11.8	0.9	0.5	5.7	11.5	13.4	13.0	10.9	10.6
Food .....	14.4	4.3	6.6	2.4	1.9	5.9	7.2	7.0	7.0	6.9	7.6
Adm. prices .....	4.7	0.6	3.9	4.6	4.2	1.0	1.7	4.2	1.4	1.2	2.4
Rent .....	24.3	2.2	2.5	3.0	2.7	2.2	2.3	2.4	2.2	2.4	2.4
Excl. exogenous ..	49.5	1.4	2.1	2.5	2.1	1.4	1.6	1.9	1.6	1.5	1.6
Imports .....	15.0	1.5	3.1	2.7	2.3	1.5	2.5	3.0	2.3	2.5	2.7
IMI .....	34.5	1.4	1.6	2.5	2.0	1.4	1.2	1.4	1.3	1.1	1.1

Note: The most recent actual figures cover January 2008.

<sup>1</sup> Weight in the index of net retail prices, per cent.

day-care institution tariffs in 2007 no longer impacts the calculation, which explains a part of the increase in annual price inflation for administered prices. In the 3rd quarter of 2008 the annual increases in the index of net retail prices are expected to exceed 4 per cent.

Energy price inflation is expected to be only modest in 2009 and 2010, assuming virtually unchanged oil prices, cf. Table 3. At the same time, annual food price inflation will recede somewhat. On the other hand, the higher wage increases are expected to lead to an increase in domestic market-determined inflation as from the 2nd half of 2008. Towards the end of the forecast period, inflation will fall back to around 2 per cent.

### Domestic demand

Growth in private consumption gained momentum in the 2nd half of 2007 after weak development in the preceding months. Consequently, consumption grew by 2.7 per cent in 2007 compared with 2006. This is somewhat below the annual growth rates of 4-5 per cent observed in the period 2004-06, and consumption growth declines over the projection period. Disposable incomes are pushed up by the high wage increases, income-tax cuts and the reduction of the indirect tax burden as a result of the tax freeze, but this effect is partly offset by high price increases for many consumer goods. The development entails only a modest decrease in the consumption ratio despite a notable drop in the wealth ratio. The consumption ratio has been relatively stable for a prolonged period, notwithstanding the higher wealth ratio.

At national level, the prices for single-family houses were almost unchanged in 2007, while the prices for owner-occupied flats declined. Housing prices have especially decreased in the areas that had seen the strongest price increases until 2006, and where prices had reached the highest levels. In other areas, housing prices continued to rise steadily in 2007. The projection operates with a modest fall in cash prices in nominal terms, cf. Table 7, corresponding to a price drop in real terms.

Residential investments levelled off in 2007, after a continually increasing trend since the beginning of the 1990s. In the projection, resi-

INCOME, WEALTH AND CONSUMPTION	Table 7			
	2007	2008	2009	2010
Cash prices, per cent year-on-year .....	4.4	0.2	-0.6	-1.0
Real disposable income, private sector, per cent year-on-year .....	0.5	0.9	2.9	1.1
Consumption ratio, per cent of private sector disposable income .....	93.2	95.2	93.8	93.5
Net lending, private sector, kr. billion .....	-60.7	-65.8	-46.0	-16.7

dential investments gradually decline from the current high level, in line with the decrease in cash prices. The most recent drop in interest rates and the continued growth in households' disposable income contribute to the sustained high level of residential investments.

Business investments rose by more than 10 per cent in 2007, i.e. a slightly lower growth rate than the strong growth in 2006. Construction investments have responded relatively late to the upswing and have risen from a low level in 2005. Growth in construction investments is expected to continue at a measured pace in the projection. Investments in plant and equipment rose considerably in 2007 in continuation of the rising trend observed since 2003, and the investment ratio has been pushed up in recent years on account of sound earnings for the business enterprises and strong capacity pressure.

In the projection the investment ratio is reduced from a high level as output growth subsides. However, the reduction is small, and at the end of the forecast period the investment ratio is still at the level seen during the upswing in the 1990s. The high investment ratio reflects both a more pronounced need for reinvestment, as a result of the quick replacement rate for high-tech capital, and higher capital per employee. The growing capital intensity reflects the difficulties in attracting labour.

Total domestic demand excluding inventory investments grew by 3.3 per cent in 2007, i.e. a lower growth rate than in the preceding three years, but clearly above the long-term average. In the projection, growth in demand dampens to around zero in 2010. Growth in private consumption decreases to 0.8 per cent in 2010, and investments subside in 2009 and 2010. Recent years' tendency for growth in domestic demand in Denmark to exceed growth abroad reverses in the projection.

### **Foreign trade and the balance of payments**

The fast pace of Danish import growth continued in 2007, particularly in the latter part of the year. Import growth for 2007 as a whole was 6.1 per cent compared with 2006, which is a lower growth rate than in the preceding three years. However, in view of the strong domestic capacity pressure, a considerable share of demand will continue to be covered by foreign production, also in the near future. The import ratio is expected to increase in the projection, albeit not at the strong pace observed in 2004-06. Total imports are expected to grow by 5.5 per cent in 2008, cf. Table 8, and import growth will then decline as growth in demand subsides.

Annual export growth was just under 7 per cent on average in 2004-06, a period of favourable sales opportunities in major export markets. Danish exports grew by 3.7 per cent in 2007, and total exports are esti-

EXPORTS AND IMPORTS				Table 8
Per cent year-on-year	2007	2008	2009	2010
Exports, real .....	3.7	3.2	2.6	3.3
Imports, real .....	6.1	5.5	2.2	2.1
Export prices .....	0.3	1.2	1.0	1.0
Import prices .....	1.7	0.5	0.7	0.7
Terms of trade .....	-1.3	0.7	0.2	0.3
Import ratio, non-energy goods .....	24.3	25.1	25.3	25.6

mated to increase by approximately 3 per cent annually in 2008-10. The decrease in export growth can be attributed to the weaker international cyclical position and the deterioration of wage competitiveness.

The manufacturing sector's assessment of export order books has been declining for the last six months against the background of the weaker international cyclical position. The forecast operates with lower growth in Denmark's industrial export volumes compared with growth in industrial import volumes in the recipient countries, entailing loss of market shares for the manufacturing sector. Oil and gas production has diminished in recent years, a trend which is expected to continue. In the projection, energy exports are thus expected to fall. Agricultural exports are estimated to increase in the light of the strong global demand for food.

In 2007 price increases were higher on the import side than on the export side, resulting in deterioration in Denmark's terms of trade. The terms of trade are expected to improve in 2008 due to such factors as the high prices for oil and agricultural exports.

In view of the high capacity pressure, the current-account surplus has gradually declined in recent years. The deterioration is mainly attributable to the balance of goods. In 2008 the current-account surplus is expected to decrease further to approximately kr. 1.8 billion, cf. Table 9. The surplus is expected to rise again to kr. 19.2 billion in 2010, corresponding to 1 per cent of GDP. This reflects an improvement in the balance of goods as economic growth abroad will outperform that of Denmark. At the same time, the surpluses on sea freight and investment income will be maintained, while the tourist balance continues to show a deficit.

BALANCE OF PAYMENTS				Table 9
Kr. billion	2007	2008	2009	2010
Trade in goods .....	-16.6	-32.5	-22.7	-6.5
Trade in services .....	33.0	35.8	32.3	30.8
Interest, transfers, etc. ....	-1.6	-1.5	-3.2	-5.1
Current account, total .....	14.8	1.8	6.4	19.2

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# Financial Turmoil, Liquidity and Central Banks

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*Morten Kjærgaard, Market Operations, and Lars Risbjerg, Economics*

## INTRODUCTION

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Since the summer of 2007, the financial markets have been characterised by turmoil. This has generated tensions in the money market in several countries and brought the central banks' liquidity management into focus.

In summary, liquidity management is based on the central banks granting short-term collateralised loans to the banks, which deposit the loan proceeds at the central bank. It is then up to the banks to redistribute the liquidity via the money market to balance liquidity supply and demand on an ongoing basis. However, the turmoil has made the banks reluctant to redistribute liquidity.

Against this background a number of central banks have implemented various measures to ease the banks' liquidity situation. While requiring collateral for all loans according to normal practice, the central banks have sought to mitigate the tensions by offering larger volumes of loans, more frequent lending and more loans with longer maturities, and by accepting a wider range of eligible collateral.

In Denmark there has not been any need or wish for extraordinary krone liquidity as a result of the turmoil, and it has not been necessary to adjust the framework for Danmarks Nationalbank's liquidity management. The situation in Denmark should be viewed in the light of Danish banks' limited exposure to the US subprime mortgages that were the source of the turmoil.<sup>1</sup> Furthermore, Danish banks have built up contingency liquidity in the form of substantial holdings of certificates of deposit issued by Danmarks Nationalbank.

The turmoil has also affected the central banks' interest-rate decisions. For example, the Federal Reserve reduced the official interest rate several times, but interest-rate decisions will not be addressed in this article. The focus of this article is on the liquidity management of the Federal Reserve (Fed), the Bank of England (BoE) and the European Central Bank

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<sup>1</sup> For a more detailed description, see Lund (2007).

(ECB) and their response to the turmoil. Finally, it describes the situation in Denmark.

## CENTRAL-BANK LIQUIDITY

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Central-bank liquidity is the banks' current-account deposits at the central bank, i.e. the amount that the banks can use for payments. In this article "the banks" is used as a generic term for the central banks' counterparties. For example, banks and mortgage-credit institutes constitute Denmark's Nationalbank's counterparties.

While the banks can lend liquidity to each other, they cannot generate more liquidity than the volume provided by the central bank. Central banks provide liquidity primarily by means of open market operations. In practice, central banks typically grant short-term loans against collateral. The collateral normally consists of securities of high credit quality, e.g. government bonds. When a loan is transacted, it is credited to the bank's account at the central bank, which in turn receives collateral for the loan. On expiry, the principal and interest are debited to the bank's account, and the collateral is returned. In the event that the bank is unable to repay the loan, the central bank keeps the collateral provided. In this way central banks protect themselves against losses on loans. Central banks conduct new open market operations on an ongoing basis so that adequate liquidity is always available in the banking system.

The banks require central-bank liquidity for their interbank payments. Besides, liquidity supply and demand are affected by autonomous factors, which include currency in circulation, government deposits at the central bank and foreign-exchange reserves.

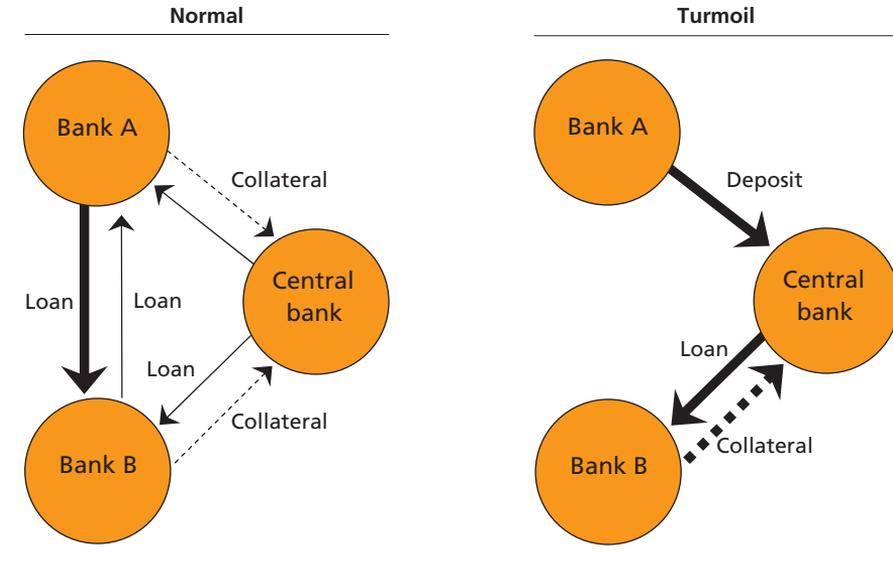
By means of open market operations a central bank, at given times, provides liquidity to the banking system as a whole, in the expectation that the banks redistribute it. Thus, a well-functioning money market continuously ensures that the liquidity requirement of banks with a liquidity shortage is met by banks with a liquidity surplus, at market interest rates reflecting the official interest rates.

When planning open market operations a central bank uses estimates of the autonomous factors and an assessment of the banks' normal behaviour with a view to ensuring an overall balance between liquidity demand and supply. The financial turmoil has, however, made liquidity management more difficult. Banks have become more reluctant to exchange liquidity, which has resulted in larger spreads than normal between money-market interest rates and official interest rates.

Chart 1 illustrates the exchange of liquidity. In the example, bank B's liquidity requirement exceeds its borrowing from the central bank. Bank

ILLUSTRATION OF LIQUIDITY EXCHANGE

Chart 1



B would normally cover this by borrowing in the money market from bank A, which is assumed to have a liquidity surplus. But in a situation of turmoil, blockages may occur in the money market, e.g. as a result of bank A building up its own contingency liquidity, preferring deposits at the central bank where the funds can be made available at short notice.

In situations of turmoil, bank A places more liquidity than normal at the central bank, while the central bank lends a larger amount to bank B against collateral, whereby the short-term interbank market is partly replaced by balances at the central bank.

Due to the tensions in the money market, a number of central banks have had to adjust their liquidity management. The normal procedures of the Fed, BoE and ECB and their response to the turmoil are outlined below.

### INSTRUMENTS OF THE FEDERAL RESERVE, THE ECB AND THE BANK OF ENGLAND

The operational target of all three central banks is to ensure that the overnight money-market interest rate reflects the official interest rate. They also have the same overall framework for implementing monetary policy.

The three central banks impose an average reserve requirement on the banks. This means that the banks must maintain a certain average min-

imum deposit at the central bank for a reserve maintenance period of about one month in the ECB and BoE and of two weeks in the Fed. The purpose of imposing reserve requirements is to stabilise the overnight interest rate. This gives the banks an incentive to lend liquidity in the money market when the overnight interest rate is high compared to the interest rate on deposits in reserve requirement accounts. On the other hand, the banks have an incentive to maintain ample reserves in periods when the overnight interest is low. As regards the BoE, the banks may themselves determine – within certain limits – the size of their reserve requirements and change them from month to month.

The three central banks mainly offer liquidity through open market operations, holding auctions of the liquidity offered at given times.

The ECB primarily provides liquidity through weekly main refinancing operations where the banks can raise 7-day loans against collateral. The ECB determines a minimum bid rate in advance, which is its official signal rate. The ECB then fixes a marginal interest rate based on the bids, and all bids at the marginal rate or higher are allotted liquidity at the bid rate. The ECB also conducts longer-term refinancing operations every month, offering 3-month loans on market terms. In case of liquidity fluctuations affecting interest rates in the short-term money market, the ECB may conduct fine-tuning operations. This may e.g. take place at the end of the reserve maintenance period when the reserve requirement is to be fulfilled.

The BoE also conducts weekly open market operations offering a given volume of liquidity as 7-day loans against collateral at a pre-determined interest rate. In addition, the BoE's open market operations include monthly auctions offering loans with a maturity of 3, 6, 9 or 12 months against collateral and direct purchase of bonds. The BoE conducts regular fine-tuning operations at the end of the reserve maintenance periods to ensure that the banks' reserves correspond to the reserve requirement.

Unlike the ECB and the BoE, the Fed's open market operations do not follow a pre-determined schedule. Every morning the Fed decides whether to conduct open market operations. The bulk of the liquidity provided by the Fed comes from direct purchases of government bonds from the banks. However, the ongoing liquidity adjustment is conducted via short-term loans against collateral, typically overnight loans.

All three central banks have a standing lending facility that enables the banks to borrow against collateral on a day-to-day basis at their own initiative. The interest rate is higher than for open market operations – typically 1 percentage point. The lending facilities act as a safety valve to relieve out liquidity shortages in the interbank market and constitute a

ceiling on the money-market interest rate. The facilities are only intended to cover a marginal borrowing requirement in relation to open market operations and are only used to a very limited extent. Furthermore, US banks have traditionally been reluctant to use the Fed's standing lending facility, i.e. the primary credit discount window, because in the US banking sector this is regarded as an indication that the bank in question is having difficulties.

In addition, the ECB and the BoE have a standing deposit facility allowing banks to place overnight deposits at a lower interest rate than for open market operations. The deposit and lending rates of the standing facilities create an interest corridor which limits the fluctuations in market interest rates. For both central banks the deposit and lending rates are 1 percentage point lower or higher, respectively, than the official interest rates. However, in the case of the BoE, the corridor narrows to  $\pm 0.25$  per cent on the last day of the reserve maintenance period in order to facilitate the fulfilment of reserve requirements without major fluctuations in short-term interest rates.

## **THE CENTRAL BANKS' RESPONSE TO THE TURMOIL**

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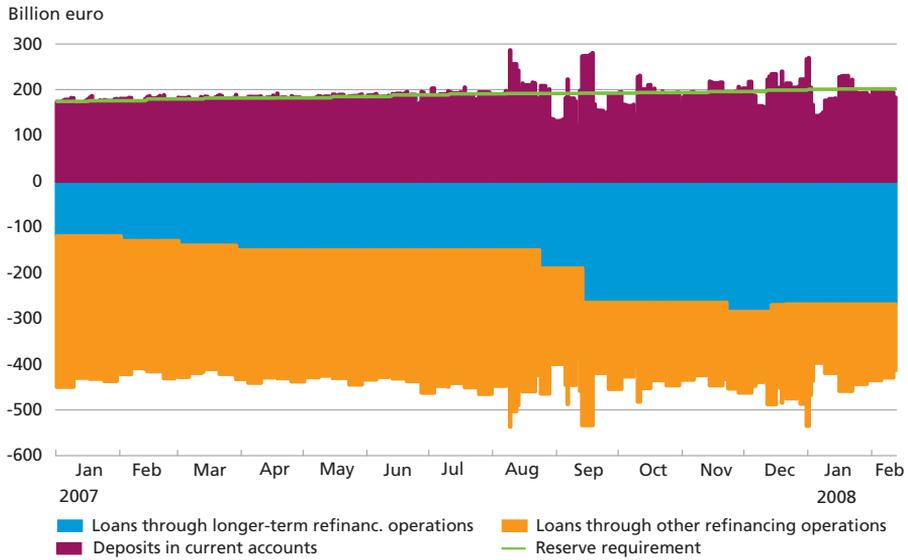
The design and use of the central banks' instruments is key to accommodating the banks' mutual exchange of liquidity. The central banks can mitigate tensions in the money market in different ways by increasing the availability of liquidity. In a sluggish money market it is important that a sufficiently large number of banks have direct access to central-bank liquidity, and that the eligible collateral for the loans is sufficiently broad-based. Other important factors are the volume of loans, their maturity and the frequency of open market operations.

All other things being equal, increasing the volume of central-bank loans gives the banks easier access to liquidity. This supports activity in the money market, because it is easier to obtain liquidity later if a loan is granted to another bank. All the central banks have in periods sought to reduce tensions in the money market in this way. Frequent open market operations are normal practice for the Fed, but the ECB in particular, and the BoE, have facilitated the banks' fulfilment of their liquidity requirements during the turmoil by also increasing the frequency.

Chart 2 shows the development in the ECB's lending, the banks' deposits in current accounts and the reserve requirements. The ECB has from time to time provided considerable liquidity in excess of the reserve requirement. This is particularly true at the beginning of the reserve maintenance periods. For the reserve maintenance period overall, average liquidity has been close to the reserve requirement, however. This reflects the banks'

ECB LOANS AND BANK DEPOSITS IN CURRENT ACCOUNTS IN 2007-08

Chart 2



Source: ECB.

lack of incentive to hold more reserves than required, as surplus reserves are non-interest-bearing. On the other hand, the deposit corresponding to the reserve requirement accrues interest at the average marginal rate in connection with the weekly open market operations during the reserve maintenance period.

The central banks have provided extra liquidity in situations when the overnight money-market interest rate indicated increasing demand in relation to supply. Both the ECB and the Fed supplied significant volumes of liquidity in early August when the turmoil started. The ECB supplied almost 100 billion euro on 9 August, and on 10 August the Fed supplied the largest volume since September 2001. The BoE did not increase the liquidity supply until the reserve maintenance period starting in September when the banks chose to raise their reserve targets.

The international money markets calmed down during parts of October and November, but in December tensions increased again due to uncertainty concerning the liquidity situation at the turn of the year. Banks in the euro area normally adjust their account balances in connection with year-end reporting with a view to balance-sheet reporting in their financial statements. This implies that the banks reduce their lending and increase their deposits of liquid funds. The central banks facilitated the situation by offering loans with maturities reaching over year-end.

Another common feature of the central banks' response to the turmoil has been to increase the volume of long-term loans. Chart 2 shows the

development for the ECB. The central banks sought to enhance certainty for the banks concerning the liquidity situation over a longer period of time. Their response should also be seen in the light of especially the long-term money-market interest rates rising as a consequence of the turmoil. Initially, the Fed offered longer term loans than normal in its discount window. Later it also set up the new Term Auction Facility, TAF, offering by auction a given volume of liquidity with a maturity of about one month.

A substantial number of banks have access to the ECB's refinancing operations, and the range of eligible collateral is very broad. This is why there have been no adjustments in these areas during the turmoil.

By comparison, access to the Fed's open market operations is much more limited in terms of both the number of counterparties and the types of eligible collateral. This reflects the fact that the banks that have access to the open market operations should be able to participate in open market operations on a daily basis and at very short notice. The Fed has chosen to accommodate liquidity availability to a wider range of banks by reducing the interest rate on loans in the discount window, which is accessible to a large number of banks subject to broadly-based collateral. For the new TAF, the group of counterparties and types of eligible collateral are the same as for the discount window. The BoE expanded the collateral base in connection with auctions concerning 3-month loans, the volume of which was also increased.

There have been several indications of dollar shortage during the period of turmoil, not only in the USA, but also internationally. The fact that only few banks participate in the Fed's open market operations, combined with a tendency for those banks to hold back liquidity due to their exposure to the financial turmoil, impeded the normal provision of dollar liquidity to foreign banks. In order to facilitate access to dollar liquidity outside the USA, the Fed established swap lines for the ECB and the Swiss National Bank of 20 and 4 billion dollars, respectively. This enabled banks in the euro area to bid for dollar liquidity through the ECB. The banks have also been able to apply the collateral applied in connection with ECB lending of euro liquidity.

The above adjustments to the central banks' liquidity management were prompted by general problems in the market and were targeted at the market as a whole. However, the BoE was also compelled to make a special liquidity facility available to Northern Rock, which is a major player in the mortgage market. The bank had a considerable deposit deficit and was highly dependent on the capital and money markets, and those financing sources dried out. Northern Rock's assets were provided as collateral, and the BoE was also guaranteed that the Treasury

would cover the loss if the assets turned out not to cover the BoE's loans. On 17 February 2008 the government proposed temporary nationalisation of Northern Rock.

## DENMARK

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In Denmark, central-bank liquidity is made up of the banks' current-account deposits at Danmarks Nationalbank. Current accounts are demand accounts used for settlement of the banks' payments.

On the last banking day of each week Danmarks Nationalbank conducts regular open market operations allowing banks to raise 7-day loans against collateral. The collateral base consists primarily of Danish government securities, mortgage-credit bonds and covered bonds.

The banks can deposit the loan proceeds in a current account or in certificates of deposit, which the banks can also purchase in connection with the regular open market operations. The lending rate equals the rate of interest on certificates of deposit, while the current-account rate is slightly lower.

Danmarks Nationalbank's open market operations are conducted through an open window where the banks' demand for loans and certificates of deposit is accommodated at an interest rate determined by Danmarks Nationalbank in advance.

In the period between the open market operations, liquidity may be affected by factors other than Danmarks Nationalbank's open market operations, e.g. payments into or withdrawals from the central government's account or interventions in the foreign-exchange market.

A ceiling has been imposed on the total current-account deposits of the banks at the close of the day, and overdrafts from day to day are not allowed. The purpose of this ceiling is to prevent the build-up of large current-account deposits that may be used for speculation in changes in interest and exchange rates. Danmarks Nationalbank will always supply more liquidity if the total current-account deposits become very low. This serves to prevent problems in the daily settlement of payments. Danmarks Nationalbank provides liquidity by buying back certificates of deposit. On the other hand it will issue more certificates of deposit if the current-account ceiling is reached. Certificates of deposit thus form part of the counterparties' contingency liquidity in case of problems in connection with the settlement of large payments. The banks can also trade certificates of deposit among themselves and thus exchange liquidity without any credit risk.

The Danish financial sector has only to a relatively modest extent been exposed to the subprime mortgages to US homeowners that were the

source of the turmoil, and the international financial turmoil has not given rise to extraordinary open market operations or adjustments to Danmarks Nationalbank's liquidity management.

In recent years the banks have built up a relatively large liquidity buffer in the form of increased holdings of certificates of deposit. There are indications of a moderate increase in contingency liquidity during the period of turmoil. The banks thus increased their borrowing from Danmarks Nationalbank beyond what can be explained by the liquidity drain from the autonomous factors. From August to December 2007, the autonomous factors drained liquidity of kr. 78 billion, while the banks' loans from Danmarks Nationalbank grew by kr. 114 billion. No further accumulation of contingency liquidity has taken place after the turn of the year.

## **SUMMARY**

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The financial turmoil has been demanding for central banks as providers of liquidity. The central banks have implemented a number of measures to instil confidence among the banks about the availability of liquidity. The specific measures have varied from country to country depending on the countries' monetary-policy instruments. The measures include more frequent open market operations and larger loans, a larger supply of long-term loans, extended collateral base and new lending facilities.

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## INTRODUCTION

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In line with other international money-market reference interest rates, e.g. Libor and Euribor, the Copenhagen Interbank Offered Rate, Cibor, has been characterised by heightened uncertainty during the period of financial turmoil which started in August 2007.<sup>1</sup> The spreads to other interest rates have widened and been highly volatile. At the same time, the reported interest rates underlying the calculation of Cibor have shown a higher-than-normal degree of dispersion.

Cibor is a reference rate for uncollateralised money-market loans and is used as the basis for fixing the interest rates for many financial products in the professional and private markets. Cibor and the other international reference rates were constructed at a time when the money market – the market for short-term interbank liquidity – was dominated by uncollateralised transactions. The last 20 years have seen a structural shift in the money market from the uncollateralised to the collateralised segment for all but the shortest maturities.

The modest depth of the markets behind Cibor and the other reference rates is not a problem under normal circumstances as the spreads to other money-market interest rates, including collateralised interest rates, are limited and relatively stable. This provides a solid foundation for fixing Cibor in relation to other interest rates. During the latest turmoil, Cibor fixing has, however, been associated with greater uncertainty as a result of the sudden change in the liquidity and credit conditions in the market for uncollateralised lending, which has increased the focus on Cibor and other reference rates.

This article describes Cibor. It explains the rules for calculation of Cibor and outlines the implications of the turmoil, followed by a review of the underlying turnover in the money market and Cibor's role as a reference rate.

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<sup>1</sup> The financial turmoil is described in more detail in Lund (2007) and Kjærgaard and Risbjerg (2008).

## DEFINITION AND CALCULATION

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Cibor is the reference rate for uncollateralised lending in kroner between prime banks. The reference rate is calculated on the basis of the interest rates provided by 12 banks, called the Cibor reporting banks. The diversity of the group of reporting banks, which includes foreign banks, enhances the quality of Cibor fixing.

No Cibor reporting bank is obliged to provide liquidity at its quoted interest rate, which must nevertheless reflect market conditions as accurately as possible. Each Cibor reporting bank reports on a daily basis to Danmarks Nationalbank interest rates for loans with maturities of 1 and 2 weeks and from 1 to 12 months. Danmarks Nationalbank then calculates Cibor as an average of the reported interest rates, after excluding the highest and lowest interest rates. This limits the effect of deviating interest rates. The calculation of Cibor is described in more detail in Box 1.

Cibor is related to Libor<sup>1</sup> (London Interbank Offered Rate), Euribor (Euro Interbank Offered Rate), Stibor (Stockholm Interbank Offered Rate), etc.

At the very short end of the money market, Danmarks Nationalbank also calculates a reference rate for uncollateralised day-to-day lending, i.e. the tomorrow/next interest rate (T/N). This is a rate of interest for loans taking effect on the first banking day after the transaction date and expiring on the second banking day after the transaction date. The T/N interest rate is based on actual lending. There are 13 T/N reporting banks that report the previous day's lending volume and the average interest rate to Danmarks Nationalbank, on a daily basis. Danmarks Nationalbank then calculates the T/N rate as the turnover-weighted average interest rate.

## DEVELOPMENT IN INTEREST RATES

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The reference rates reflect current and expected future monetary-policy interest rates but also include liquidity and credit risk premiums. Under normal circumstances, the liquidity and credit risk premiums are small and stable for interest rates such as Cibor, Libor USD and Euribor. Interest-rate developments will thus be determined by the level and expected adjustments of the monetary-policy interest rates.

A short-term interest-rate swap is an agreement for settlement of a fixed swap rate against an average overnight (or tomorrow-next) interest rate in a given period. Since short-term interest-rate swaps reflect current

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<sup>1</sup> Libor is calculated for 10 currencies, including Danish kroner. Cibor and Libor DKK are close parallels.

## CALCULATION OF CIBOR

Box 1

Cibor is based on daily reporting by the following 12 banks: ABN AMRO, Barclays Capital, Danske Bank, Deutsche Bank, Fionia Bank, HSH Nordbank, Jyske Bank, Nordea, Nykredit Bank, Royal Bank of Scotland, Spar Nord Bank and Sydbank. Reporting takes place under the auspices of the Danish Bankers Association, which has laid down rules for participation in the group.

For each of the 14 maturities in all, Cibor is calculated by excluding the three highest and three lowest interest rates and calculating a simple average of the remaining interest rates. If there are 11 or fewer reporting banks, the two highest and the two lowest interest rates are excluded. If there are fewer than eight reporting banks, the highest and the lowest interest rate are excluded, before an average of the remaining interest rates is calculated. The individual reporting banks quote interest rates to two decimals, while the calculated Cibor for each maturity is published to four decimals.

The Cibor reporting banks report their interest rates at 10.30 a.m., and the final Cibor rates are announced at 11 a.m. together with the interest rates reported by the individual banks. Publication of the interest rates of the reporting banks supports the quality of Cibor fixing. The Cibor rates are published e.g. at the websites of the Danish Bankers Association, [www.finansraadet.dk](http://www.finansraadet.dk), and Danmarks Nationalbank, [www.nationalbanken.dk](http://www.nationalbanken.dk).

and expected monetary-policy interest rates, the spreads between the reference rates and short-term interest-rate swaps provide an indication of the size of the liquidity and risk premiums<sup>1</sup>.

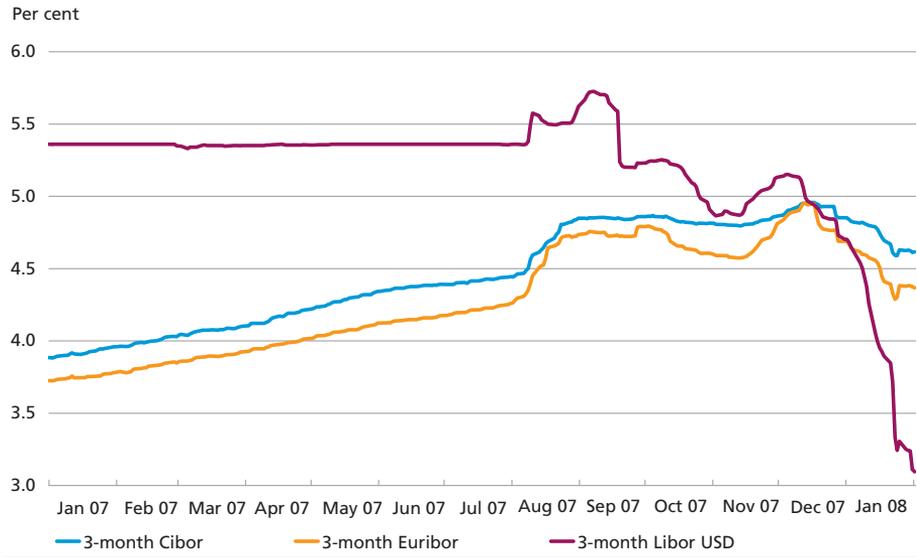
The gradual increases in Cibor and Euribor until August were driven by expectations of rising monetary-policy interest rates. Libor USD was stable, cf. Chart 1. The liquidity and credit risk premiums were small and stable. Libor USD has declined steadily since September, particularly in connection with the Federal Reserve's interest-rate cuts in 2008, and Cibor and Euribor have fallen since mid-December. The general widening of the spread to short interest-rate swaps since the beginning of August can be attributed to the increase in liquidity and credit spreads as a consequence of the financial turmoil, cf. Chart 2. The credit and liquidity premiums are described in greater detail in Box 2.

Libor, Euribor and Cibor, etc. have been used as indicators of the extent of the financial turmoil. The turmoil has induced the banks to hold more contingency liquidity, made them more reluctant to lend liquidity and increased their concern about credit risk. The market has

<sup>1</sup> Short-term interest-rate swaps such as Overnight Index Swaps (OIS) entail exchange of a floating overnight interest rate against a fixed interest rate. The credit element of an OIS is modest as no principal is exchanged, the variable leg is an overnight interest rate and many contracts are subject to margin settlement in order to reduce the counterparty risk. Nevertheless, an OIS is only an approximation of the monetary-policy interest rate. The short-term interest rate in interest-rate swaps is typically slightly higher than the monetary-policy interest rate.

REFERENCE INTEREST RATES (3 MONTHS)

Chart 1

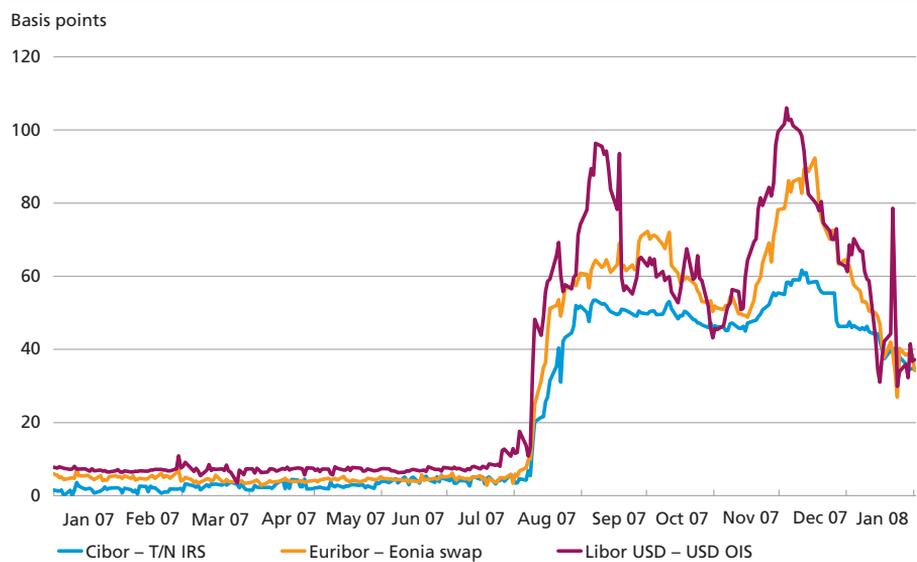


Source: Reuters.

had to adjust liquidity and credit premium levels amidst generally heightened uncertainty, wide bid-offer spreads, and limited turnover. At the same time, the fixing of reference rates is associated with greater uncertainty due to the varying exposure to the turmoil among the banks behind the reference rates.

SPREADS BETWEEN REFERENCE INTEREST RATES AND SHORT-TERM INTEREST-RATE SWAPS (3 MONTHS)

Chart 2



Source: Reuters.

CREDIT AND LIQUIDITY PREMIUMS

Box 2

The uncollateralised interest rate (Cibor) reflects both current and expected monetary-policy interest rates, credit risk and liquidity risk, etc. The rate of interest for short-term interest-rate swaps (T/N IRS) can be used as an approximation of the risk-free interest rate, and the Cibor-T/N IRS spread thus serves as an indicator of the total credit and liquidity premiums contained in Cibor.

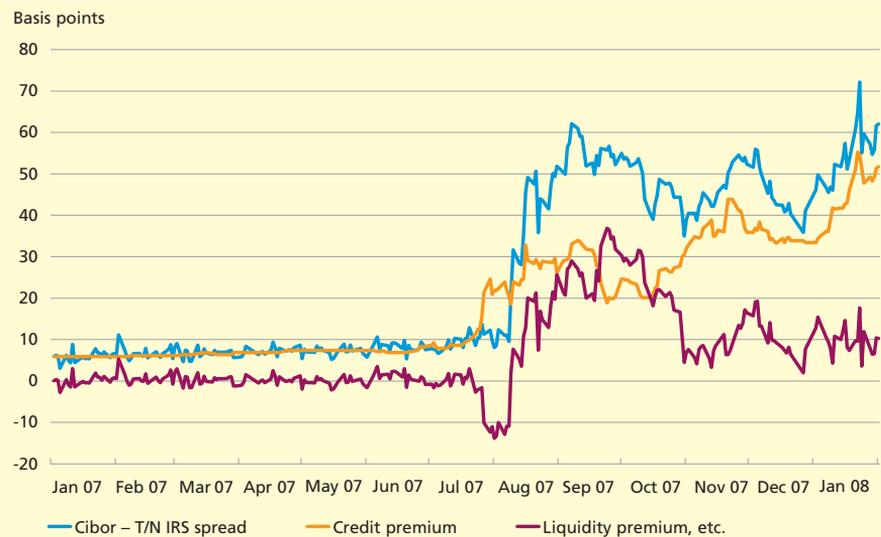
The spread can be broken down into a credit premium and a premium for other risk factors, including liquidity risk. For example, an estimate of the credit premium can be based on the Credit Default Swap (CDS) spread which is an indicator of the credit premium in the market.<sup>1</sup> The part of the Cibor-T/N IRS spread that is not accounted for by the credit premium reflects other factors, including the liquidity premium. However, CDS spreads are not available for all Cibor reporting banks. Comparison of the Cibor-T/N IRS spread with the average CDS spread for the two largest banks in the Danish money market provides an indication of the development.

Prior to the financial turmoil, Cibor contained relatively small and stable credit and liquidity premiums, cf. Chart 3. The credit premium began to rise in July 2007, i.e. before the money-market interest rates reacted to the financial turmoil in August. In the first months after the onset of the turmoil, the liquidity premium, etc. accounted for a considerable share of the widening of the spread. The credit premium rose further in October, November and January, whereas the liquidity premium, etc. declined.

The Bank of England (2007) has broken down Libor spreads for pounds sterling, euro and dollars. The spread between Libor and short-term interest-rate swaps widened even more than the spread between Cibor and short-term interest-rate swaps. The liquidity premium seems to have accounted for most of the widening of the spread at the beginning of the turmoil. Subsequently the liquidity premium declined, while the credit premium continued to rise in accordance with the development illustrated in Chart 3.

BREAKDOWN OF 12-MONTH SPREAD BETWEEN CIBOR AND T/N IRS

Chart 3

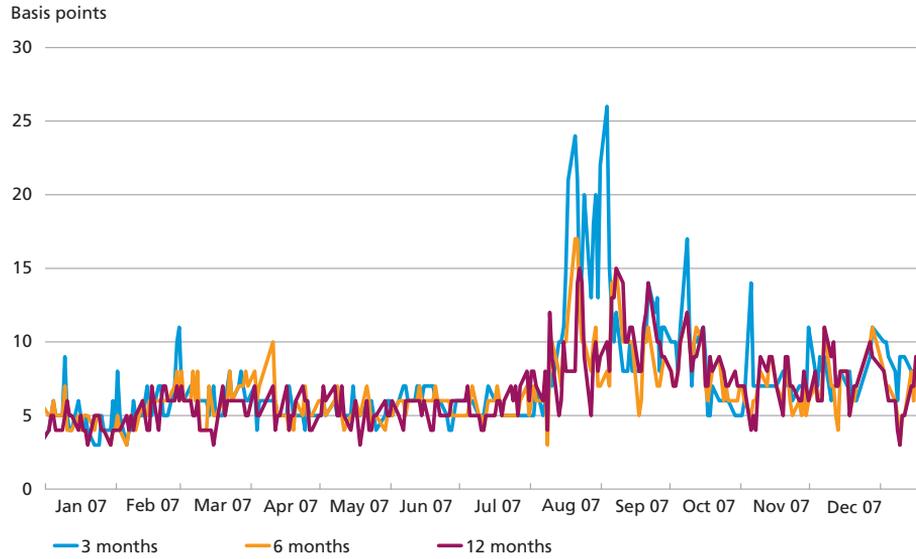


Source: Reuters, Bloomberg and own calculations.

<sup>1</sup> A Credit Default Swap (CDS) is a contract that provides insurance against the liquidation of a certain business enterprise. The price of a CDS reflects the premium demanded by the investor for holding bonds issued by a certain business enterprise in relation to holding risk-free bonds.

DISPERSION AMONG INDIVIDUAL CIBOR REPORTING BANKS' RATES

Chart 4



Source: Danmarks Nationalbank.

The uncertainty is reflected in e.g. greater dispersion of the reported interest rates, measured as the difference between the highest and the lowest reported rate, cf. Chart 4. The average dispersion among the interest rates reported by the Cibor reporting banks has been approximately 5 basis point in recent years. When the international financial turmoil spilled over into the money market, the dispersion among the reported interest rates increased to an average of 9 basis points. This trend is also observed for e.g. Libor USD and Libor EUR, for which the dispersion among the reported interest rates rose from an average of 2 basis points to an average of 10-11 basis points.

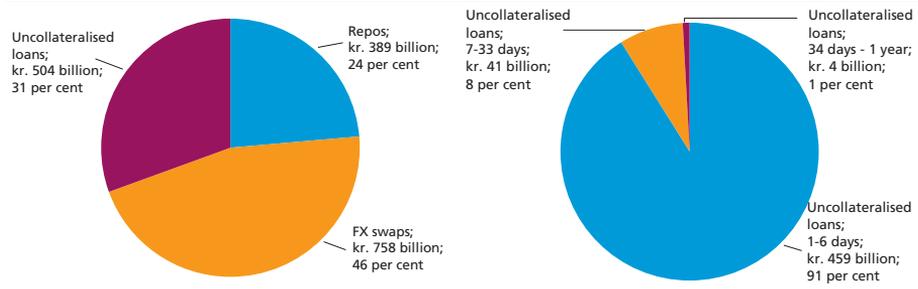
A limited depth of the markets underlying Cibor and other reference rates is not necessarily a problem if the spreads to other, more frequently traded interest rates are stable. Under normal market conditions, the reporting of interest rates for Cibor can be based on e.g. uncollateralised interbank lending in the euro area, FX swaps, repos or short-term interest-rate swaps such as Copenhagen Interest T/N Average swaps (CITA swaps).

## TRADING VOLUME IN THE MONEY MARKET

Cibor was first calculated in 1988 when the structure of the money market was different from today. At that time, the uncollateralised segment accounted for a large share of the money market, but a structural shift has taken place over the years towards the collateralised segment, both in Denmark and internationally.

LOAN TRADING VOLUME IN THE MONEY MARKET

Chart 5



Note: Based on rates reported to Danmarks Nationalbank by the group of T/N reporting banks. The figures are the average monthly trading volume from January 2006 to June 2007. For repo loans, bonds are deposited as collateral. For FX swaps, foreign exchange is deposited as collateral.

Source: Danmarks Nationalbank.

Uncollateralised lending accounts for about one third of the total turnover, but the largest share by far is at the short end, cf. Chart 5. Around 1 per cent of turnover in uncollateralised lending has a maturity of more than 1 month. Day-to-day T/N loans constitute the largest segment in the uncollateralised money market. The short maturities also account for the principal share of turnover of repurchase agreements and FX swaps, although a distinct shift towards longer maturities is observed compared with uncollateralised loans.

The short maturities also account for the largest share of turnover in the uncollateralised euro money market, cf. ECB (2007). The largest segment is overnight loans maturing on the first banking day after transaction, making up around 70 per cent of the total turnover. 4 per cent of the turnover has a maturity of 1 month or more. After weighting by maturity, overnight loans account for approximately 10 per cent of total uncollateralised loans, while maturities of 1 month or more make up around two thirds.

## USE

The trading volume is modest in the uncollateralised interbank market underlying Cibur reporting, but Cibur is used in connection with a wide range of financial instruments. Cibur is used as the reference rate for a number of loan agreements, mortgage-credit bonds and financial derivatives. Furthermore, several banks have recently opted for Cibur as the basis for their lending and deposit rates. In many loan agreements, the interest rate is fixed as Cibur plus an individually determined premium that reflects the relative credit risk and the customer's negotiation power.

There are no statistics for the volume of variable-rate loan agreements between banks and business enterprises with Cibur as the reference rate.

## INTEREST-RATE DERIVATIVES

Box 3

- *Forward Rate Agreement (FRA)*: An agreement to freeze an interest rate for a given future period. Standardised FRAs have a maturity of 3 or 6 months and are settled four times a year. Cibur is the reference rate. At the beginning of the future period, difference settlement takes place of an amount equivalent to the difference between the agreed reference rate and the agreed FRA rate.
- *Interest-rate swap*: A contract to exchange interest payments for a period. Fixed-interest payments are typically exchanged for floating-interest payments. The floating interest rate is normally based on Cibur for Danish kroner or on similar reference rates for other currencies.
- *Tomorrow/Next Interest Rate Swap (T/N IRS)*: A short-term interest-rate swap applying the T/N rate as the reference rate. The parties exchange a floating interest rate (the T/N rate) for a fixed interest rate. The contract can be concluded for standardised maturities between 1 and 12 months. Settlement is only of a net amount on expiry of the contract, depending on the development of the T/N rate during the term of the contract. T/N IRS is also called CITA (Copenhagen Interest T/N Average).
- *Interest-rate option*: An agreement granting one party the right, but not the obligation, in a future period to receive or pay a certain interest rate for an agreed principal.

The volume of outstanding Cibur-based mortgage-credit bonds amounted to kr. 416 billion in mid-January. The volume has increased by almost kr. 200 billion over the last two years. The bonds are used to finance various loan types, including variable-rate corporate loans and capped variable-rate loans to households. 6-month Cibur is used as the reference rate for 88 per cent of the Cibur bonds, while the remaining 12 per cent is based on 3-month Cibur.

Interest-rate derivatives is another large group of financial instruments that are based on reference rates such as Cibur, T/N, etc. Box 3 describes various interest-rate derivatives. According to the Bank for International Settlements, BIS, the daily turnover of interest-rate derivatives in Danish kroner totalled kr. 5.5 billion in April 2007, cf. Table 1. On the basis of the BIS survey, the notional principal amount can be estimated to be around kr. 1,250 billion.<sup>1</sup>

The Danish government is a big player in the market for interest-rate swaps. At the end of 2007 the central government held krone-denominated interest-rate swaps for kr. 65 billion, entirely based on 6-month Cibur, cf. Danmarks Nationalbank (2008). In addition, the central government holds euro-denominated interest-rate swaps amounting to kr.

<sup>1</sup> The estimate is based on the assumption that the maturity distribution of the turnover of krone-denominated interest-rate derivatives is almost the same as that for the turnover of interest-rate derivatives in currencies for which a notional principal amount is calculated in BIS (2007). The notional principal amount is solely used to determine the size of interest payments.

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**TRADING VOLUME IN THE MARKET FOR INTEREST-RATE DERIVATIVES IN  
APRIL 2007**

Table 1

Kr. billion per banking day	Danish kroner	Globally
Forward Rate Agreements (FRAs) .....	2.5	1,424.0
Interest-rate swaps .....	2.8	6,670.8
Interest-rate derivatives (OTC) .....	0.2	1,187.2
Interest-rate derivatives total .....	5.5	9,294.6

Note: For the global figure, "Interest-rate derivatives total" does not match the sum of the individual instruments as the total figure includes a small trading volume of "other products". Amounts have been converted to Danish kroner at the average dollar/kroner exchange rate in April 2007.

Source: BIS (2007).

57 billion, based on 6-month Euribor. Interest-rate swaps are used to manage interest-rate risk on the government debt.

Internationally, the interest rates for a very large trading volume of financial contracts are based on a fixed uncollateralised lending rate such as Libor, Euribor, etc. The daily trading volume of interest-rate derivatives alone exceeds kr. 9,000 billion, cf. Table 1, and the notional principal amount was 388,627 billion dollars at end-June 2007, according to BIS (2007).

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## CONCLUSION

The purpose of calculating reference rates such as Cibor, Libor, etc. is to provide a transparent and representative reflection of market conditions, thereby facilitating valuation of various products. The benchmark status of the interest rates ultimately depends on the market perceiving them as the best reference for the associated instruments.

The reference rates have been useful, notwithstanding the structural shift in the money market towards the collateralised segment observed since the introduction of Cibor, etc. Under normal market conditions, fixing of the reference rates is thus associated with great certainty in view of the modest and stable credit risk element.

The financial turmoil since August 2007 has increased uncertainty in connection with fixing of the reference rates. This can be attributed to a sudden and substantial change in the liquidity and credit conditions. Under such circumstances the spread between uncollateralised and collateralised interest rates will widen and uncertainty in connection with interest-rate fixing will increase. Another factor that has led to increased uncertainty is the very limited activity in the underlying market.

No reporting bank is obliged to trade at its quoted interest rate, which must nevertheless reflect the actual market conditions as accurately as possible, not least in the light of the wide range of associated instru-

ments. The diversity of the group of reporting banks, the calculation method and publication of the individual banks' reported interest rates, all aim to enhance the quality of Cibor fixing.

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# The Financial Sector's Payments via Kronos

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*Irene Madsen, Payment Systems*

## INTRODUCTION

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Danmarks Nationalbank's payment system, Kronos, plays a key role in the Danish payments infrastructure. The payments infrastructure is based on electronic payment systems handling retail payments (Dankort, Direct Debit, inpayment forms, etc.) for a daily average of kr. 23 billion, securities transactions (e.g. share and bond trading) for kr. 93 billion, and foreign-exchange transactions (Danish kroner against foreign exchange) for kr. 203 billion. Danmarks Nationalbank acts as settlement bank in the financial infrastructure, i.e. the financial institutions settle their transactions through accounts at Danmarks Nationalbank. This article describes payment flows in Kronos, particularly payments between participants, and payments settled via connected settlement systems.

## PAYMENT SETTLEMENT IN KRONOS

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Since Danmarks Nationalbank acts as settlement bank, participants in the payments infrastructure hold accounts at Danmarks Nationalbank. The account holders are primarily banks, mortgage-credit institutes and branches of foreign credit institutions.

In addition, other entities may open accounts if they are, in the assessment of Danmarks Nationalbank, of major significance to the settlement of payments. Examples are CLS Bank and Euroclear Bank. Financial institutions that do not hold accounts must use correspondent banks to gain access to the Danish payments infrastructure. At the end of 2007, there were 126 account holders. Some 40 smaller Danish credit institutions did not hold accounts at Danmarks Nationalbank.

Kronos has many direct participants compared with the payment systems of other small countries in Western Europe. This is presumably the reason why the concentration ratio in Danmarks Nationalbank's payment system is relatively low, cf. Table 1.

Payments can be sent to Kronos via SWIFT (Society for Worldwide Interbank Financial Telecommunication) or manually through a Kronos terminal via the PI network. SWIFT is an international financial network

PARTICIPANTS IN NATIONAL RTGS SYSTEMS, 2006 Table 1

	MFIs <sup>1</sup>	Direct participants	Turnover in relation to GDP	Concentration ratio <sup>2</sup>
Belgium (EUR) .....	107	16	61	0.90
Denmark (DKK) .....	192	125	40	0.69
Netherlands (EUR) .....	371	99	60	0.72
Ireland (EUR) .....	79	21	38	0.76
Norway (NOK) .....	151	145	20 <sup>3</sup>	n.a.
Sweden (SEK) .....	206	20	44	0.77
Austria (EUR) .....	810	84	31	0.59

Source: ECB, Blue Book and Norges Bank.

<sup>1</sup> MFIs indicate the number of payment institutions in the country, e.g. the central bank, credit institutions, etc.

<sup>2</sup> The concentration ratio is the share of the five largest participants' payment transactions in the national RTGS system in value terms.

<sup>3</sup> Turnover comprises only RTGS payments, not settlement of netted transactions, and is therefore not directly comparable with Denmark.

used globally by financial institutions, payment and settlement systems, exchanges, etc. to send and receive different types of financial message, including payment instructions. The PI network is a closed network linking together the data centres of Danish banks, VP Securities Services (VP), Payment Business Services (PBS) and Danmarks Nationalbank. To accommodate participants using the Kronos terminal/PI network as well as participants using SWIFT, Kronos includes a module – Poseidon – which can translate SWIFT payment messages into PI-network messages and vice versa. The largest participants typically remit and receive payments via SWIFT, since this allows fully automated processing of payments, i.e. Straight-Through-Processing, STP.

Transactions in Kronos are concentrated on the 10 largest banks, which account for 78 per cent (in value terms) of current-account transactions, cf. Table 2. Total transactions in 2007 amounted to kr. 70,259 billion, corresponding to approximately 40 times Denmark's gross domestic product.

TRANSACTIONS IN KRONOS BROKEN DOWN BY PARTICIPANTS, 2007 Table 2

Institution	Number	Value, DKK billion	Percentage
10 largest banks .....	569,902	54,689	78
Other banks with SWIFT (41) .....	103,609	7,809	11
Other banks without SWIFT (59) .....	32,521	1,359	2
Mortgage-credit institutes (5) .....	11,123	2,615	4
Other participants in Kronos (11) .....	19,607	3,787	5
<b>Total (126) .....</b>	<b>736,762</b>	<b>70,259</b>	<b>100</b>

Note: Figures in brackets indicate the number of institutions.

Source: Danmarks Nationalbank.

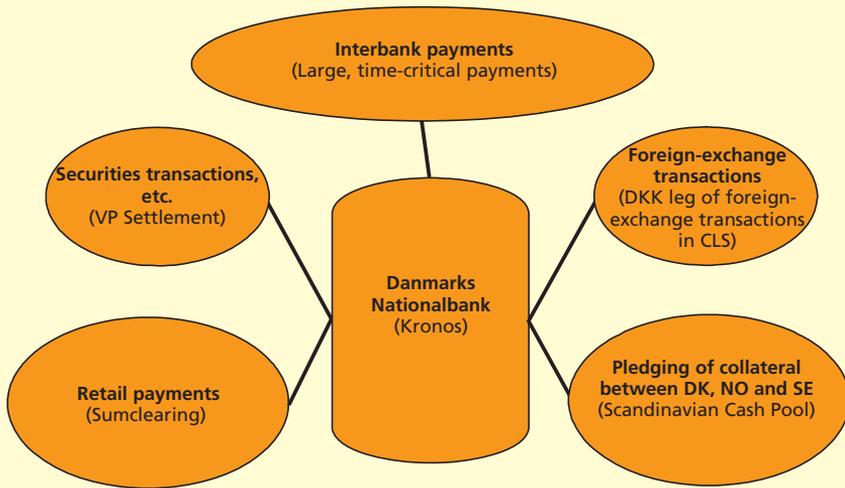
**Settlement of payments via the participants' current accounts**

Box 1 outlines the key payment and settlement systems in the Danish financial infrastructure. Table 3 shows the current-account transactions of Kronos participants broken down by system.

CORE PAYMENT AND SETTLEMENT SYSTEMS IN THE DANISH FINANCIAL INFRASTRUCTURE Box 1

Danmarks Nationalbank's payment system, Kronos, is at the hub of Danish payments settlement, cf. Chart 1. Kronos is a real-time gross settlement (RTGS) system and was commissioned in 2001.

PAYMENTS IN KRONER SETTLED AT DANMARKS NATIONALBANK Chart 1



*VP Settlement* is VP's system for settlement of securities transactions and periodic payments (interest, repayments and dividend). For securities transactions, the securities leg is settled through VP, while the cash leg is settled via the participants' accounts at Danmarks Nationalbank.

The *Sumclearing* is the Danish Bankers Association's system for settlement of retail payments. Nearly all Danish retail payments are settled via this system, e.g. Dankort transactions, Direct Debit, credit transfers, etc. The system is operated by PBS, while final transfer of funds between participants takes place through accounts at Danmarks Nationalbank.

CLS is an international system for settlement, primarily of foreign-exchange transactions, in 15 currencies. CLS Bank International was established in 2002 by some of the world's largest banks. The Danish krone joined CLS in 2003, after which pay-ins and pay-outs for settlement of the krone leg of participants' foreign-exchange transactions take place over CLS Bank's account at Danmarks Nationalbank. In 2007, CLS was extended to include settlement of payments relating to credit derivatives.

SCP (Scandinavian Cash Pool) is a system for pledging of cross-border collateral for intraday credit in Danish and Norwegian kroner and Swedish kronor. The system was established in 2003 and is available to credit institutions in Denmark, Norway and Sweden that participate in the payment systems of the respective central banks.

TRANSACTIONS ON PARTICIPANTS' CURRENT ACCOUNTS BY TYPE, 2007 Table 3

	Kr. billion	Kr. billion per banking day	Percentage
Interbank payments .....	30,876	124	44
Monetary-policy operations .....	13,662	55	19
Miscellaneous, including decentralised banknote holdings .....	535	2	1
<b>Collateral, etc. related to other settlement systems:</b>			
CLS settlement, incl. CLS Bank's account ....	3,460	14	5
Sumclearing .....	9,861	40	14
VP Settlement .....	9,039	36	13
Scandinavian Cash Pool .....	2,827	11	4
<b>Total .....</b>	<b>70,259</b>	<b>282</b>	<b>100</b>

Note: Transactions stated on the basis of participants' debit entries on current accounts (value date).  
Source: Danmarks Nationalbank.

Interbank payments, i.e. payments between participants, account for 44 per cent of transactions in terms of value, cf. Table 3. These payments are settled individually as gross transactions immediately after Danmarks Nationalbank's receipt of the payment instructions.

The concentration on the largest participants is pronounced, cf. Table 4. Interbank payments involving the 10 largest remitters and recipients account for 97 per cent of transactions, of which 76 per cent relate to payments between these 10 participants. Interbank payments between other participants make up only 3 per cent.

Settlement of payments for connected settlement systems (CLS, VP Settlement and the Sumclearing) constitute 32 per cent of the transactions in value terms, cf. Table 3. Gross amounts settled via the settlement systems are considerably larger, cf. Table 5, as opposite payments are set off against one another, i.e. netted, prior to settlement.

CONCENTRATION OF INTERBANK PAYMENTS, 2007 Table 4

Kr. billion (percentage)	10 largest recipients	Other recipients	Total
10 largest remitters .....	23,590 (76)	3,288 (11)	26,878 (87)
Other remitters .....	3,058 (10)	940 (3)	3,998 (13)
<b>Total .....</b>	<b>26,648 (86)</b>	<b>4,228 (14)</b>	<b>30,876 (100)</b>

Note: The Table shows the distribution of interbank payments on the 10 largest remitters and recipients and other participants.

Source: Danmarks Nationalbank.

GROSS AND NET SETTLEMENT AMOUNTS IN THE SUMCLEARING, VP AND CLS, 2007

Table 5

Kr. billion	Gross amount settled in the system	Net amount settled at Danmarks Nationalbank	Netting effect
Sumclearing .....	5,750	1,339	1:4
VP Settlement .....	23,172	1,855	1:12
CLS settlement (in kroner) .....	50,446	2,020	1:25

Source: VP, PBS, CLS and Danmarks Nationalbank.

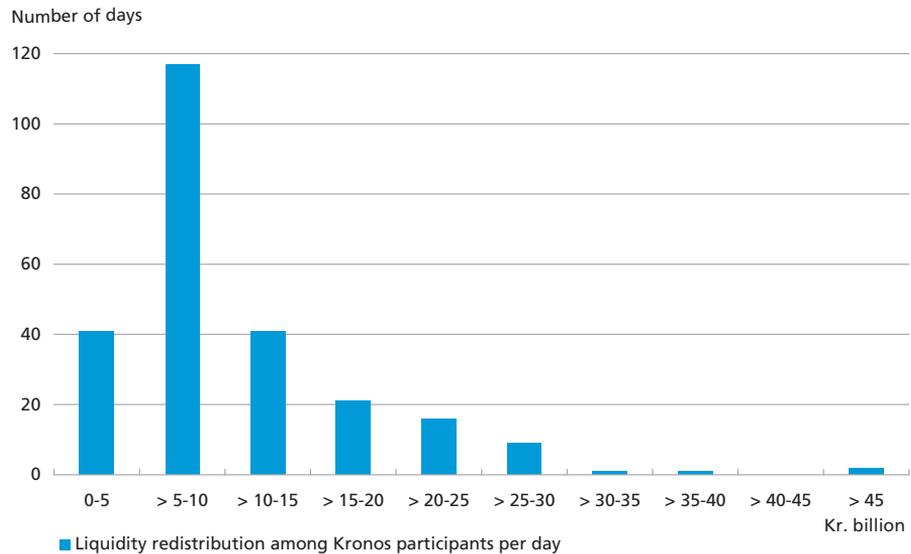
**Liquidity redistribution via Kronos**

Considerable redistribution of liquidity among participants takes place via Kronos, cf. Chart 2. In 2007, such redistribution typically amounted to kr. 5-10 billion, but on peak settlement days it exceeded kr. 45 billion.

Payment settlement traffic in Kronos is significantly influenced by the international financial markets, particularly the US market. A review of settlement of payments in Kronos via the participants' current accounts on US public holidays shows that activity almost halves on these days. Of the 10 days in 2007 when current-account activity was lowest, five were US public holidays.

FREQUENCY DIAGRAM FOR DAILY LIQUIDITY REDISTRIBUTION AMONG KRONOS PARTICIPANTS, 2007

Chart 2



Note: Liquidity redistribution within a day is calculated by adding the net liquidity change for participants receiving liquidity within that day.

Source: Danmarks Nationalbank.

## SETTLEMENT OF PAYMENTS FOR CONNECTED SETTLEMENT SYSTEMS

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VP Settlement and the Sumclearing are multilateral net settlement systems in which payments are settled in fixed blocks and netted among participants prior to settlement at Danmarks Nationalbank. CLS is a gross settlement system, but considerable netting takes place, cf. Table 5.

Sumclearing and VP Settlement cycles have been scheduled in consultation with the financial sector. Settlement of retail payments in the Sumclearing primarily takes place in a nightly block, while securities transactions are settled both at night and during the day. Moreover, participants in VP Settlement can opt for real-time settlement of transactions within Kronos' opening hours.

Settlement cycles have been planned so as to take several factors into account. The settlement blocks have been scheduled with a view to minimising participants' liquidity requirements. For example, mortgage payments to the mortgage-credit institutes via the Sumclearing are received before the mortgage-credit institutes disburse interest and payments via VP Settlement. Likewise, government disbursements of interest and payments are placed in the block immediately prior to the first securities trading block. In addition, VP trading blocks are designed to ensure an efficient link to the international markets via Euroclear.

Account holders have separate settlement accounts for the various settlement types. In these accounts, amounts can be reserved for each settlement block, either in their current accounts or under the automatic collateralisation arrangement. This means that within a given period of time, lasting until the settlement block has been run, account holders cannot dispose of the funds in the relevant accounts. In this way Danmarks Nationalbank can guarantee the amounts reserved for settlement without incurring any risk. The settlement concept and the collateral pledged by participants are described in the Appendix.

### The Sumclearing

In 2007, 98 per cent of Sumclearing payments were settled in the 1st normal settlement block, which is the primary block. If one or more participants have not reserved sufficient liquidity for settlement, they are excluded from the settlement, and the net positions of the remaining participants are settled. The net positions of the excluded participants cannot be settled until Kronos opens at 7.00 a.m. (2nd extra settlement block). A total of 1.2 per cent of the net payments in 2007 were settled after Kronos had opened.

The liquidity reserved for settlement primarily comes from the participants' current accounts, in that many participants arrange for fixed

transfers from their current accounts to their settlement accounts. Participants generally maintain substantial excess liquidity for settlement of payments, cf. Table 6. On average, the liquidity reserved constitutes just over 900 per cent of the funds required for settlement. However, the sums settled via the Sumclearing vary considerably over the month, with large net payments on the first and last few banking days of each month. These are primarily large payments to and disbursements from the central government's account, e.g. taxes, social benefits and interest and repayments on mortgage-credit loans. Average daily net settlement amounted to kr. 5.4 billion, but if the two first and two last banking days of each month are excluded, the average is kr. 3.6 billion per day.

### VP Settlement

VP Settlement in Danish kroner settles securities transactions and periodic payments (interest, repayments and dividend). Securities transactions are settled in five blocks at night and during the day, while periodic payments are settled in two blocks. The central government's periodic payments are settled as the first block, after which the first securities block, VP10, is settled. VP10 is the largest trading block by far, comprising 70 per cent of aggregate net payments, cf. Table 7. The larger the number of transactions settled within the same block, the greater the netting effect. Consequently participants aim to settle their transactions in VP10. The next block, VP20, is settled after Euroclear's first nightly settlement

SUMCLEARING, 2007		Table 6	
	Kr. million	Kr. million per banking day	Percentage
<b>Liquidity reserved by participants for settlement of payments</b>			
Transferred from current accounts .....	9,856,799	39,586	80.6
Under the automatic collateralisation arrangement .....	2,365,863	9,501	19.4
<b>Total .....</b>	<b>12,222,661</b>	<b>49,087</b>	<b>100.0</b>
<b>Net payments</b>			
1st normal settlement .....	1,306,471	5,247	97.5
2nd normal settlement .....	14,869	-	1.1
1st extra settlement .....	2,861	-	0.2
2nd extra settlement .....	4,998	-	0.4
1st extraordinary settlement .....	6,196	-	0.5
2nd extraordinary settlement .....	4,040	-	0.3
<b>Total .....</b>	<b>1,339,434</b>	<b>5,379</b>	<b>100.0</b>

Note: A daily average is only stated for the 1st normal settlement since this is the only block to be settled daily.  
Source: Danmarks Nationalbank.

VP SETTLEMENT, 2007		Table 7	
	Kr. million	Kr. million per banking day	Percentage
<b>Trading settlement</b>			
<i>Liquidity reserved by participants for settlement of payments</i>			
Transferred from current accounts .....	3,544,650	14,236	100
<i>Net payments</i>			
VP10 – Securities transactions .....	1,126,988	4,526	70
VP12 – Subscription .....	1,841	7	0
VP20 – Securities transactions .....	203,534	817	13
VP30 – Securities transactions .....	35,980	144	2
VP40 – Securities transactions .....	166,570	669	10
VP60 – Securities transactions .....	72,611	292	5
<b>Total</b> .....	<b>1,607,523</b>	<b>6,456</b>	<b>100</b>
<i>Of which</i>			
Using automatic collateralisation .....	1,221,118	4,904	76
Through settlement account .....	386,405	1,552	24
<b>Total</b> .....	<b>1,607,523</b>	<b>6,456</b>	<b>100</b>
<b>Periodic payments</b>			
<i>Liquidity reserved by participants for settlement of payments</i>			
Transferred from current accounts .....	485,834	1,951	14
Extended automatic collateralisation arrangement .....	2,914,940	11,707	86
<b>Total</b> .....	<b>3,400,774</b>	<b>13,658</b>	<b>100</b>
<i>Net payments</i>			
VP35 – interest, repayments and dividend ...	180,425	725	73
VP05 – periodic payments from the central government .....	66,730	268	27
<b>Total</b> .....	<b>247,155</b>	<b>993</b>	<b>100</b>

Source: Danmarks Nationalbank.

block. This block is primarily used to settle Danish participants' purchases of securities issued by VP in the international market. Between blocks VP30 and VP40, periodic payments relating to securities are settled in block VP35. These payments can be reinvested and settled in transactions with the same value date in blocks VP40 and VP60.

Trading settlement does not entail the same need for excess liquidity cover as the Sumclearing. This is primarily attributable to the automatic collateralisation arrangement, whereby participants may pledge their own portfolios of securities as collateral for settlement and may also pledge securities purchased as collateral in the settlement block in which

they are received. In trading settlement, use of automatic collateralisation accounts for 76 per cent of net payments, while 24 per cent are drawn on settlement accounts. Automatic collateralisation is used mainly by the large Danish banks.

Participants can also make use of automatic collateralisation when settling periodic payments, but unlike in trading settlement an amount is reserved prior to settlement (the extended automatic collateralisation arrangement). Excess liquidity cover for settlement of periodic payments is considerable, the reason being that these payments are time-critical. While trading for which there is insufficient cover can be deferred until a later settlement block, periodic payments must be settled in full on the date in question.

### CLS settlement

Payments through Danmarks Nationalbank to and from CLS settlement take place through settlement accounts or directly by payment into CLS Bank's current account. Any participant opting for automatic collateralisation must have a settlement account. Prior to settlement, CLS sends out a pay-in schedule to participants. The first pay-in to CLS Bank must then take place by 8.00 a.m. As participants know the size and time of their payments prior to settlement, excess liquidity cover is not required on the part of participants in CLS settlement. However, a small excess liquidity cover does exist, cf. Table 8, due to participants' use of automatic collateralisation.

### Conclusion

Most Danish payments are settled through Danmarks Nationalbank in Kronos. Despite the high number of direct participants in Kronos, settlement of payments is still mainly concentrated on the largest participants.

CLS SETTLEMENT, 2007

Table 8

	Kr. million	Kr. million per banking day	Percentage
<b>Participants' reserved liquidity for settlement of payments</b>			
Through settlement account .....	1,182,016	4,747	31
Using automatic collateralisation.....	2,490,000	10,000	66
Payments directly to CLS Bank's current account .....	120,668	485	3
<b>Total .....</b>	<b>3,792,684</b>	<b>15,232</b>	<b>100</b>
<b>Payments after netting .....</b>	<b>2,019,711</b>	<b>8,111</b>	<b>100</b>

Source: Danmarks Nationalbank.

Several settlement systems are connected to Kronos, and settlement in the Danish systems is coordinated. The Sumclearing and VP Settlement generally involve considerable excess liquidity cover. However, the amounts settled within a day vary considerably, especially around the turn of the month, and thus prudent liquidity management by Kronos participants is required.

## LITERATURE

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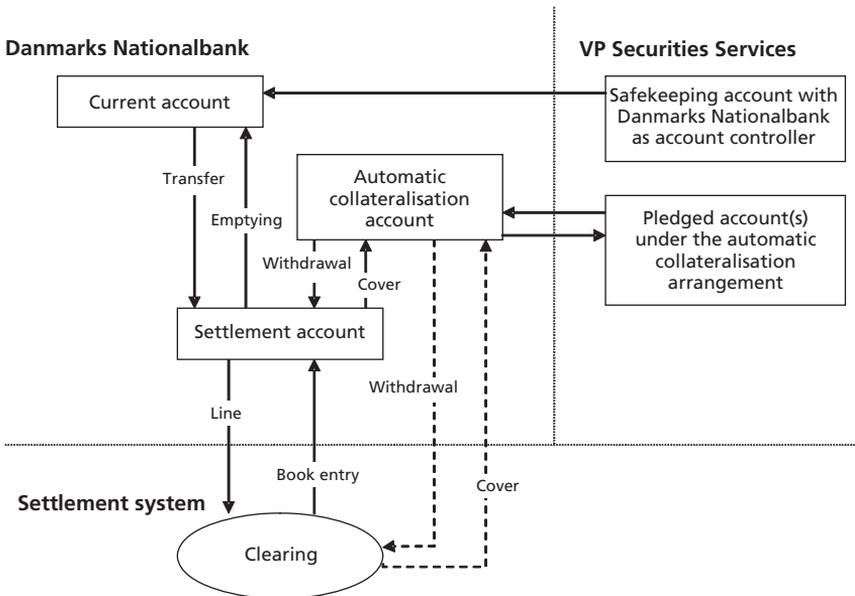
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**APPENDIX**

Danmarks Nationalbank's settlement concept is outlined in Chart 3. The current account is the account holder's primary account at Danmarks Nationalbank. It is used for settlement of payments between account holders, i.e. interbank payments. Current accounts are also used for payments between account holders and Danmarks Nationalbank, and for payments to and from the central government. In addition, account holders may have a number of settlement accounts at Danmarks Nationalbank for the connected settlement systems.

Apart from the balance of its current account, a participant may increase the maximum amount available for settlement of payments by obtaining intraday credit from Danmarks Nationalbank. Such credit is collateralised via securities registered in a safe-custody account with VP Securities Services, VP, by way of traditional pledging of securities or under the automatic collateralisation arrangement. Traditional pledging means that the securities used as collateral by the individual participant are registered in an account, known as a safekeeping account, at VP with Danmarks Nationalbank as the account controller. Under the automatic collateralisation arrangement, participants can provide collateral by way of securities in one or more designated accounts at VP, frequently their trading accounts. As opposed to traditional pledging of collat-

DANMARKS NATIONALBANK'S SETTLEMENT CONCEPT Chart 3



eral, this offers the advantage that specific assets are not bound. Automatic collateralisation is most important for the largest participants in VP Settlement, but is also used by small participants.<sup>1</sup>

For settlement in kroner, an account holder can provide liquidity for the settlement blocks either by transferring funds from its current account to its settlement account prior to settlement or via the automatic collateralisation arrangement. In the Sumclearing, the account holder reserves a specific amount under the automatic collateralisation arrangement prior to settlement. The amount is credited to the account holder's settlement account for the Sumclearing and debited to the account holder's automatic collateralisation account at Danmarks Nationalbank.

For securities settlement in VP, the account holder's entire automatic collateralisation account is included, i.e. no specific amount is reserved. If liquidity is needed for settlement, the automatic collateralisation arrangement is first utilised to its full extent, and if this proves insufficient then the settlement-account deposit is used.

Prior to each settlement cycle, Danmarks Nationalbank notifies the Sumclearing or VP of each individual account holder's settlement-account balance. In the Sumclearing, the settlement-account balance is equivalent to the account holder's line in the settlement block. In VP securities settlement the account holder's line also depends on the amount available under the automatic collateralisation arrangement. The Sumclearing and VP then check that each individual account holder's net payment in the settlement block does not exceed its line. If this criterion is met, the Sumclearing and VP inform Danmarks Nationalbank of the account holders' net positions in that block. Danmarks Nationalbank then books the positions to the account holders' settlement accounts and automatic collateralisation accounts, and settlement has been concluded.

When settlement has taken place, the settlement accounts are emptied and the funds transferred to the current accounts. Any unused amounts reserved under the automatic collateralisation arrangement are, however, first used to reduce the credit under this arrangement. Any excess amount in a Sumclearing settlement account is then deposited to the account holder's current account.

For CLS payments in Danish kroner, participants in Kronos transfer amounts from their own current accounts or CLS settlement accounts to CLS' current account at Danmarks Nationalbank. If the account holder

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<sup>1</sup> Since 2003, account holders have also had the option to pledge collateral for intraday credit in kroner via SCP.

has a CLS settlement account, payments from CLS' current account must always be made to this account.

An account holder must have a CLS settlement account in order to obtain credit for CLS settlement under the automatic collateralisation arrangement. As is the case for the Sumclearing, the account holder reserves a specific amount, which is then credited to its CLS settlement account and debited to the automatic collateralisation account.

Any deposit in the CLS settlement account at 1.30 p.m. is used to reduce the credit under the automatic collateralisation arrangement for CLS settlement. Any residual amount after cover of credit under the automatic collateralisation arrangement is transferred to the account holder's current account.

Danmarks Nationalbank's settlement concept is described in more detail in Danmarks Nationalbank (2005) and in previously published articles, e.g. Danmarks Nationalbank (2001).



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# Measures to Prevent Money Laundering and Terrorist Financing

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*Helene Vinten, Administration – Legal Affairs*

## INTRODUCTION AND DEFINITIONS

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Money laundering and terrorist financing often take place as transactions through normal payment systems, in an attempt to conceal the connection between the various links in the transaction chain. In recognition of this, there is strong international focus on how payment service providers can contribute to the prevention of money laundering and terrorist financing. The Financial Action Task Force on Money Laundering (FATF) has established a number of international standards that lay down far-reaching requirements in terms of the measures to be taken by financial institutions and certain non-financial corporations<sup>1</sup> in relation to their customers. These include rules requiring the financial institutions to obtain identification data concerning their customers. In addition, the financial institutions have an obligation to report to the financial intelligence unit any suspicions of money laundering or terrorist financing. In Denmark, such suspicions are reported to the Money Laundering Secretariat of the Public Prosecutor for Serious Economic Crime.

These international standards have been implemented in the EU by means of a number of EU acts as well as national legislation. In Denmark, they have been implemented mainly through the Money Laundering Act.

### **Money laundering**

Money laundering entails the conversion or transfer of money or other assets, knowing that such money or assets are derived from criminal activity, with the purpose of concealing or disguising the illicit origin of the money. Money laundering also covers the acquisition, possession or use of money or other assets, knowing that such money or assets are derived from criminal activity. In addition, the concept of money laundering includes being an accomplice in such activity.

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<sup>1</sup> Hereinafter referred to as financial institutions. In addition to financial institutions, they include mutual funds and enterprises that carry out currency exchange and transfer of funds for commercial purposes. Lawyers, accountants and estate agents, among others, are also subject to the Danish Money Laundering Act.

## **Terrorist financing**

Terrorist financing means the collection or transfer of funds with the intention that they should be used, or in the knowledge that they are to be used, to provide financial support to terrorists, potential terrorists or terrorist organisations.

## **FATF**

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Recognising the need to counter the increase in international money laundering activities, the FATF was established by the G7 Summit that was held in 1989. It comprised experts from the G7 member states, the European Commission and eight other countries.

The FATF was given the responsibility of examining money laundering techniques and trends, reviewing action which had already been taken at a national or international level, and setting out the measures that still needed to be taken to combat money laundering. In 2001, the development of standards in the fight against terrorist financing was added to the mission of the FATF.

Since its establishment, the FATF has expanded its membership from the original 16 to the current 34 members (32 member states and 2 regional bodies)<sup>1</sup>. The FATF holds three annual plenary meetings. Denmark is represented by the Danish Financial Supervisory Authority and the Public Prosecutor for Serious Economic Crime.

The FATF's activities can be divided into three focus areas:

- Making recommendations for national regulations on measures to combat money laundering and terrorist financing.
- Assessing its members' implementation of the recommendations.
- Examining money laundering and terrorist financing trends and identifying the methods used.

## **FATF RECOMMENDATIONS**

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In 1990, the FATF presented a report including 40 Recommendations that constituted a comprehensive action plan for combating money laundering. The 40 Recommendations have been revised on an ongoing basis, most recently in 2003. In October 2001, they were supplemented with eight Special Recommendations on Terrorist Financing, and subsequently with one additional Special Recommendation. At the same time

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<sup>1</sup> EU member states: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden, UK. Other countries: Argentina, Australia, Brazil, Canada, China, Hong Kong (China), Iceland, Japan, Mexico, New Zealand, Norway, Russia, Singapore, South Africa, Switzerland, Turkey, USA. Regional bodies: the European Commission and the Gulf Cooperation Council, cf. [www.fatf-gafi.org](http://www.fatf-gafi.org).

the scope of the 40 Recommendations was expanded to include terrorist financing.

The Recommendations lay down the framework for national regulations on measures to combat money laundering and terrorist financing. The Recommendations are divided into sections concerning the member states' legal systems, measures to be taken by financial institutions, administrative measures to combat money laundering and terrorist financing, and the framework for international cooperation. The member states are committed to implementing the Recommendations in national law. The Recommendations constitute minimum standards that allow member states a measure of flexibility when implementing them within their respective legal and financial systems.

Furthermore, the Recommendations have been recognised or accepted by a large number of international organisations, including the International Monetary Fund, IMF, and the World Bank. Besides the member states, many other countries have made commitments to combat money laundering by implementing the 40 FATF Recommendations. It is the FATF's declared intention to encourage worldwide implementation of the standards.

Basically, financial institutions are required to report any suspicions of money laundering or terrorist financing to the financial intelligence unit. Thus, disclosing such information in good faith to the intelligence unit would not constitute a breach of the professional secrecy of financial institutions. Neither the financial institution nor its employees would incur any liability in damages or criminal liability for disclosing information in good faith to the intelligence unit.

In addition, the employees and management of financial institutions are prohibited by law from disclosing – even to the customer – the fact that an investigation of the customer has been instituted or that the police have been notified.

### **Money laundering**

The money-laundering measures set out in the FATF Recommendations are based on the premise that precautionary measures are taken via the financial system to prevent misuse thereof, primarily with a view to preventing anonymous transfers of funds.

#### *Customer identity and customer due diligence*

One of the fundamental elements of the Recommendations is the "know your customer" policy, which is designed to ensure that the financial institutions do not keep anonymous accounts or accounts in obviously fictitious names. The object is to enable the financial intelligence

unit to trace a chain of transactions, once a financial institution becomes aware of and reports a suspicious transaction.

The financial institution should therefore be convinced that the customer is who he says he is. The "know your customer" policy implies first of all that the customer must identify himself, and that the financial institution must verify the customer's identity using reliable identification documents when

- establishing a regular customer relationship;
- an occasional customer, i.e. a customer carrying out only individual transfers of funds, requests a financial transaction of DKK 100,000 or more;
- there is a suspicion that the transaction is associated with money laundering or terrorist financing;
- the employee at the financial institution has doubts about the veracity or adequacy of previously obtained customer identification data.

When a transaction is carried out at the request of a person acting on behalf of another person or a company, the identity of the person or company on whose behalf the transaction is carried out should be verified in the same way. If the customer is a company, the company's ownership and control structure should be clarified and the identity of the company's beneficial owners should be established.

When establishing a customer relationship, the financial institution should also obtain information on the purpose and intended scope of the customer relationship. In addition, the financial institution is required to perform ongoing due diligence on the customer relationship to ensure that the transactions are consistent with the institution's knowledge of the customer and the customer's business and risk profile.

The measures under the "know your customer" policy should be implemented on the basis of a specific risk assessment, and different measures are therefore required of the financial institutions depending on the type of customer or transaction.

### *Record-keeping*

Financial institutions should keep records on identification data or copies of identification documents for at least five years after the customer relationship is terminated. Other documents concerning customer transactions, or documents pertaining to client orders, should be kept for at least five years after the transaction was carried out. The customer information should be kept in a single file. In this respect the money laundering rules permit a departure from the rules on the protection of personal data so as to allow financial institutions to keep records of the personal data they have collected.

*General due diligence*

In addition to the specific measures that financial institutions are required to take pursuant to the "know your customer" policy, the institutions are subject to a general duty of due diligence in respect of customer activities which, due to their nature, could be associated with money laundering or terrorist financing. This is particularly relevant in connection with complex or unusually large transactions, as well as any transaction patterns that are unusual in relation to the customer.

**Terrorist financing**

The terrorist attacks in New York and Washington on 11 September 2001 gave rise to new international anti-terrorist financing measures. These measures make it possible to control money flows and to freeze assets that can be linked to individuals or groups who are believed to be involved in acts of terrorism.

In October 2001, the FATF expanded its mandate to deal with the issue of terrorist financing. It subsequently established what now amounts to nine Special Recommendations on Terrorist Financing, which the FATF encourages all countries to implement. The object of implementing these Special Recommendations is to prevent terrorists and their supporters – on an international level – from gaining access to the financial system.

The Special Recommendations primarily entail that the anti-money laundering measures also apply to terrorist financing, but terrorist financing differs from money laundering. A suspicion of money laundering is "backward-looking" as it relates to whether the money was derived from criminal activity and is now subject to a money-laundering attempt. Conversely, a suspicion of terrorist financing is "forward-looking" in that it is related to whether a customer is attempting to provide financial support to terrorists or potential terrorists. Terrorist financing may thus include money from both legal and illegal activities.

In addition, the Special Recommendations include provisions regarding information on the payer in connection with transfers of funds, regarding the freezing and seizing of assets, cf. Box 1, and regarding the registration or licensing of all enterprises and persons who carry out transfers of funds or other assets for commercial purposes.

**DANISH LEGISLATION**


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The Money Laundering Directive of 2005 was implemented through the revised Danish Money Laundering Act of February 2006.<sup>1</sup> The Act

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<sup>1</sup> Act no. 117 of 27 February 2006 on measures to prevent money laundering and financing of terrorism as subsequently amended.

## EU REGULATIONS

Box 1

**EU Money Laundering Directive**

As a result of a revision of the FATF Recommendations in 2003, a new EU Directive on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing (the Money Laundering Directive) was adopted in October 2005.<sup>1</sup> The Directive incorporated large parts of the FATF Recommendations adapted to the EU legislation, thus ensuring consistent implementation of the international standards in the EU, regardless of FATF membership.

**EU Regulation on information on the payer to accompany transfers of funds**

In November 2006, the Council and the European Parliament adopted a Regulation determining the information on the payer that is to accompany transfers of funds.<sup>2</sup> The Regulation is an implementation of one of the nine Special Recommendations against Terrorist Financing. According to the Regulation, transfers of funds into and out of the EU should contain complete information on the payer, i.e. name, address and account number or civil registration number. Transfers between two EU member states or within the same EU member state should only contain information on the payer's account number. Upon request, the financial institutions should, however, be able to provide complete information on the payer within three days.

**EU Regulations on the freezing of funds**

In response to the attacks on 11 September 2001, the US President signed an Executive Order a few days later containing a list of names of presumed terrorists and persons and organisations presumed to provide financial support for terrorists. The Executive Order makes it possible to freeze their funds and block their access to the financial system. The freezing of funds is an interim remedy; the majority of the persons on the list have not been convicted of a terrorist act by a court of law.

In support of the US fight against terrorism, the EU member states decided to introduce similar rules. In December 2001, the Council therefore adopted a Regulation on specific restrictive measures directed against certain persons and entities with a view to combating terrorism.<sup>3</sup> The Regulation ensures the concurrent implementation in all EU member states of a UN Resolution adopted in September 2001, ordering all UN member states to combat terrorism, specifically by implementing a freezing of the funds of terrorist suspects.<sup>4</sup> Two lists have been drawn up in relation to the Regulation: a general list with the names of all terrorist suspects, and a restricted list with fewer names specifically aimed at the freezing of funds. The Council, acting by unanimity, decides which names should be put on or taken off the two lists.

In addition, the Council, in May 2002, adopted a Regulation imposing certain specific restrictive measures directed against certain persons and entities associated with the Al-Qaida network.<sup>5</sup>

In Denmark, the Danish Enterprise and Construction Authority is in charge of the administration of that part of the Regulations which concerns the freezing of funds, and thus the name lists. The Enterprise and Construction Authority submits information on any amendments to the Regulations to the financial institutions. They then have to check immediately whether they have any customers whose funds are subject to the freezing requirement.

<sup>1</sup> Directive 2005/60/EC of the European Parliament and of the Council of 26 October 2005, also referred to as the Third Money Laundering Directive.

<sup>2</sup> Regulation (EC) No 1781/2006 of the European Parliament and of the Council of 15 November 2006, which entered into force on 1 January 2007.

<sup>3</sup> Council Regulation (EC) No 2580/2001 of 27 December 2001 as subsequently amended.

<sup>4</sup> UN Security Council Resolution No 1373 of 28 September 2001.

<sup>5</sup> Council Regulation (EC) No 881/2002 of 27 May 2002.

entered into force on 1 March 2006, though certain provisions requiring the introduction of new procedures in Danish financial institutions did not enter into force until 1 January 2007. As mentioned above, the Money Laundering Act applies not only to financial institutions, but also to mutual funds and enterprises and persons that carry out activities involving currency exchange or transfer of money or other assets for commercial purposes. The Act applies to Denmark's Nationalbank insofar as it carries out activities corresponding to those of the financial institutions.

The Money Laundering Directive requires the EU member states to prohibit money laundering and terrorist financing under their national legislation. Under Danish law the concept of money laundering in terms of *criminal law* (receiving stolen goods) does not include the criminal acts (e.g. theft) on which the subsequent act of receiving stolen goods is based. These acts are comprised by the money laundering concept in the Directive. However, the requirement to notify the Public Prosecutor for Serious Economic Crime is the same, whether the act of money laundering is performed by the original perpetrator (the thief) or a third party (the receiver of stolen goods). As a result, the definition of money laundering in the Money Laundering Act has been expanded to include the perpetrator's disposal of the proceeds.

With regard to the definition of terrorist financing, the Money Laundering Act refers directly to the Danish criminal code, which criminalises any form of direct or indirect support for terrorists or potential terrorists.

If a transaction gives rise to suspicion, it should, as a rule, be suspended until the Public Prosecutor for Serious Economic Crime has been notified. In 2007, the Public Prosecutor for Serious Economic Crime received 1,349 statutory notifications. If the Public Prosecutor for Serious Economic Crime states that the transaction must not be carried out, the public authorities assume responsibility under the rules of criminal procedure, including the responsibility for the customer's inability to meet any time limits for payment.

The Danish Financial Supervisory Authority and the Danish Commerce and Companies Agency monitor compliance with the Money Laundering Act, e.g. by carrying out inspections at individual enterprises. The Financial Supervisory Authority and the Commerce and Companies Agency can issue orders against enterprises that fail to observe the provisions of the Money Laundering Act. Wilful or grossly negligent violation of the Money Laundering Act is punishable by a fine or imprisonment.

## **DENMARK'S COMPLIANCE WITH THE FATF RECOMMENDATIONS**

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As a central element of the fight against money laundering and terrorist financing, national measures should be monitored and evaluated in rela-

tion to the FATF standards. The FATF's evaluations are therefore important tools to ensure the effective implementation of the standards in all countries.

The evaluation process consists of a self-evaluation to be submitted by each member state once a year, and of alternating mutual evaluations based on visits to the member states concerned. The alternating evaluations are typically performed by teams of legal and financial experts from other member states and from the FATF Secretariat.

The IMF, being an FATF observer, has made money laundering and terrorist financing part of its work since 2004. As the timing of the mutual evaluation coincided with the IMF review of Denmark's financial sector (FSAP), the IMF also performed the mutual evaluation of Denmark in 2005-06.<sup>1</sup>

The general conclusion of its evaluation report was that Denmark has a solid framework for anti-money laundering and combating terrorist financing.<sup>2</sup> The IMF did not assess the efficiency of the implementation of the Money Laundering Directive since the revised Money Laundering Act was new at the time of the evaluation.

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<sup>1</sup> For information on the complete IMF review, see Gitte Wallin Pedersen, IMF Review of the Financial Sector in Denmark, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2006.

<sup>2</sup> While the IMF had very few points of criticism, its major point was that the Faroe Islands and Greenland did not have any updated legislation on measures to prevent money laundering and terrorist financing, cf. IMF, *FATF Third Mutual Evaluation Report on Anti-Money Laundering and Combating the Financing of Terrorism – Kingdom of Denmark*, June 2006.

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## Press releases

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### **28 JANUARY 2008: NEW POLAR COIN INSPIRED BY THE SIRIUS PATROL**

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The second coin in the series of three with Polar motifs is issued on 26 February and is inspired by the Sirius dog sledge patrol. The Polar coins are issued to mark the International Polar Year (IPY) 2007-2009.

The coin is designed by the sculptor Margrete Sørensen, who has been inspired by Greenland, the Sirius Patrol and the 'Canis Major' constellation with Sirius as its brightest star. The face of the coin shows a profile of the Queen.

Like the first Polar coin, which was issued in March 2007 and featured a polar bear, the new coin will be minted in three different versions: a gold coin in Greenlandic gold, a silver coin and an ordinary 10-krone coin. This morning His Royal Highness Crown Prince Frederik, who is the Danish patron of the International Polar Year, visited The Royal Mint and struck the first gold coin.

The gold and silver coins will have denominations of 1,000 and 100 kroner, respectively. The gold coin will be sold at a recommended retail price of DKK 2,500 and will be issued in an edition of maximum 5,000. The silver coin will be sold at a recommended retail price of DKK 300 and will be issued in an edition of maximum 35,000. The ordinary 10-krone coin will be issued in an edition of 1.2 million to be distributed via banks and used as ordinary coins in circulation.

The Sirius coins can be purchased from banks, coin dealers and Danmarks Nationalbank (Banking Services) from 26 February. From 19 February they can also be ordered via The Royal Mint's website, [www.royalmint.dk](http://www.royalmint.dk), for delivery on the date of issue. A statement by Margrete Sørensen, pictures of the coin and photos from today's visit by the Crown Prince to The Royal Mint can also be found at the website.



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## **Symbols and Sources**

0 Magnitude nil or less than one half of unit employed.

... Data not available or of negligible interest.

Some of the most recent statistics may be provisional. Due to rounding-off there may be small differences between the sum of the individual figures and the totals stated.

Date of going to press: 9 April 2008.

The Tables section of this publication is thus based on more recent information than the equivalent section of the Danish edition.

Danmarks Nationalbank is the source for Tables 1-14, 16-18 and 23-24, while the Copenhagen Stock Exchange is the source for series of bond yields and the share-price index in Table 1. Statistics Denmark is the source for Tables 15 and 19-22. The calculations in Tables 20 and 24 have been made by Danmarks Nationalbank on the basis of data from Statistics Denmark and OECD.

INTEREST RATES AND SHARE-PRICE INDEX

Table 1

Effective end-of-year/ from	The Nationalbank's interest rates		The ECB's minimum bid rate	End of period	Inter-bank interest rate, 3-months uncollat- eralized	Bond yields		Share- price index OMXC20 (prev.KFX)  3.7.89 =100
	Discount rate	Lending and certifi- cates of deposit				10-year central- government bond	30-year mort- gage- credit bond	
2003 .....	2.00	2.15	2.00	2003 .....	2.16	4.46	5.45	244.35
2004 .....	2.00	2.15	2.00	2004 .....	2.16	3.87	5.07	286.66
2005.....	2.25	2.40	2.25	2005 .....	2.46	3.30	4.39	393.52
2006.....	3.50	3.75	3.50	2006 .....	3.81	3.95	5.24	441.48
2007.....	4.00	4.25	4.00	2007 .....	4.65	4.48	5.61	464.14
2006 6 Oct ...	3.25	3.50	3.25	Sep 07 .....	4.65	4.51	5.56	499.93
8 Dec ..	3.50	3.75	3.50	Oct 07 .....	4.61	4.31	5.48	507.92
2007 9 Mar ..	3.75	4.00	3.75	Nov 07 .....	4.65	4.18	5.49	471.76
7 Jun ...	4.00	4.25	4.00	Dec 07 .....	4.65	4.48	5.61	464.14
				Jan 08 .....	4.40	4.08	5.47	407.83
				Feb 08 .....	4.40	4.06	5.38	431.24
2008 9 Apr ..	4.00	4.25	4.00	Mar 08 .....	4.50	4.19	5.61	428.10

## SELECTED ITEMS FROM THE NATIONALBANK'S BALANCE SHEET

Table 2

End of period	The foreign-exchange reserve (net)	Notes and coin in circulation	The central government's account with the Nationalbank	The banks' and the mortgage-credit institutes' net position with the Nationalbank			
				Certificates of deposit	Deposits (current account)	Loans	Total net position
	Kr. billion						
2003 .....	224.2	49.7	44.0	157.3	12.9	48.0	122.2
2004 .....	217.6	52.0	60.8	160.4	6.9	72.6	94.6
2005 .....	212.3	56.2	56.4	207.6	12.8	135.3	85.1
2006 .....	171.7	59.8	73.8	163.2	8.8	153.7	18.2
2007 .....	168.8	61.6	89.9	200.5	9.4	216.8	-6.9
Oct 07 .....	181.6	58.7	69.3	167.5	22.5	154.4	35.5
Nov 07 .....	179.2	59.4	102.7	153.3	10.7	168.1	-4.1
Dec 07 .....	166.8	61.6	87.1	200.5	9.4	216.8	-6.9
Jan 08 .....	175.8	59.1	91.9	178.0	22.4	203.7	-3.3
Feb 08 .....	180.3	58.8	107.6	190.8	7.4	213.4	-15.2
Mar 08 .....	179.7	60.0	111.7	178.7	22.1	217.6	-16.9

FACTORS AFFECTING THE BANKS' AND THE MORTGAGE-CREDIT  
 INSTITUTES' NET POSITION WITH THE NATIONALBANK

Table 3

	Central-government finance			Net purchase of foreign exchange by the National- bank	The National- bank's net bond purchases	Other factors	The banks' and the mortgage-credit institutes' net position with the Nationalbank	
	Domestic gross financing require- ment	Sales of domestic central- govern- ment securities	Liquidity effect				Change in net position	End of period
2003 .....	99.7	94.1	5.6	31.0	-1.0	-3.1	32.5	122.2
2004 .....	75.5	92.6	-17.1	-6.4	-2.6	-1.2	-27.3	94.6
2005 .....	39.5	30.9	8.6	-15.4	-2.2	-0.5	-9.5	85.1
2006 .....	-14.5	16.2	-30.6	-30.0	-4.9	-1.2	-66.7	18.2
2007 .....	-26.1	2.9	-29.1	5.5	-0.4	-1.4	-25.3	-6.9
Oct 07 .....	3.8	5.6	-1.8	-0.1	0.4	-0.3	-1.9	35.5
Nov 07 .....	-30.2	5.2	-35.4	-1.0	-2.5	-0.7	-39.6	-4.1
Dec 07 .....	7.2	-7.8	15.0	-12.0	-3.2	-2.7	-2.8	-6.9
Jan 08 .....	-0.9	3.9	-4.8	6.4	-1.7	3.8	3.7	-3.3
Feb 08 .....	-13.3	2.5	-15.8	4.5	0.0	-0.6	-11.9	-15.2
Mar 08 .....	-0.3	3.7	-4.1	-1.1	0.6	2.9	-1.7	-16.9

SELECTED ITEMS FROM THE CONSOLIDATED  
 BALANCE SHEET OF THE MFI SECTOR

Table 4

End of period	Total balance	Assets				Liabilities		Foreign assets, net <sup>1</sup>
		Domestic lending		Domestic securities		Domestic deposits	Bonds, etc. issued	
		Public sector	Private sector	Bonds, etc.	Shares, etc.			
Kr. billion								
2003 .....	3,359.0	89.6	2,062.0	123.3	43.3	754.7	1,157.9	-70.7
2004 .....	3,684.5	97.5	2,246.2	100.8	46.3	848.9	1,222.1	-65.7
2005 .....	4,228.2	107.8	2,584.2	75.9	53.5	971.3	1,318.2	-172.9
2006 .....	4,682.1	116.8	2,956.0	51.8	60.3	1,077.0	1,433.7	-222.8
2007 .....	5,497.8	119.9	3,353.7	43.3	63.5	1,219.7	1,505.2	-304.5
Sep 07 .....	5,282.5	115.1	3,220.2	52.9	63.3	1,179.1	1,480.7	-256.9
Oct 07 .....	5,321.3	117.9	3,235.3	54.3	65.0	1,197.7	1,485.8	-285.1
Nov 07 .....	5,422.3	117.7	3,281.5	39.4	63.4	1,236.1	1,484.6	-285.0
Dec 07 .....	5,497.8	119.9	3,353.7	43.3	63.5	1,219.7	1,505.2	-304.5
Jan 08 .....	5,495.4	121.7	3,361.5	43.1	62.5	1,259.3	1,536.6	-367.9
Feb 08 .....	5,629.5	119.4	3,392.9	38.8	62.7	1,285.2	1,508.3	-355.6
Change compared with previous year, per cent								
2003 .....	...	12.1	6.0	-13.7	18.6	4.3	2.8	...
2004 .....	...	8.8	8.9	-18.2	7.0	12.5	5.5	...
2005 .....	...	10.6	15.0	-24.7	15.4	14.4	7.9	...
2006 .....	...	8.3	14.4	-31.8	12.8	10.9	8.8	...
2007 .....	...	2.7	13.5	-16.4	5.2	13.3	5.0	...
Sep 07 .....	...	3.0	12.8	-14.6	11.5	12.2	7.2	...
Oct 07 .....	...	4.2	12.5	-7.5	11.0	11.4	7.6	...
Nov 07 .....	...	1.6	12.3	-5.0	8.2	12.8	7.2	...
Dec 07 .....	...	2.7	13.5	-16.4	5.2	13.3	5.0	...
Jan 08 .....	...	0.6	13.1	-9.5	0.8	14.5	7.6	...
Feb 08 .....	...	2.2	12.7	-18.2	0.6	17.1	4.4	...

Note: The MFI sector includes Danish monetary financial institutions, i.e. banks and mortgage-credit institutes, other credit institutions, money-market funds and Danmarks Nationalbank.

<sup>1</sup> The net foreign assets of the MFI sector has been compiled as the difference between all assets and liabilities vis-a-vis non-residents.

## MONEY STOCK

Table 5

End of period	Bank- notes and coin in circulation <sup>1</sup>	Deposits on demand	M1	Time deposits with original maturity =<2 years	Deposits at notice with original maturity =< 3 months	M2	Repur- chase agree- ments	Bonds, etc. issued with original maturity =< 2 years	M3
	Kr. billion								
2003 .....	41.0	428.1	469.1	112.2	19.2	600.5	2.7	77.3	680.5
2004 .....	43.7	492.8	536.5	119.2	21.0	676.7	2.0	20.2	699.0
2005 .....	47.3	596.3	643.5	114.1	18.4	776.0	14.2	8.4	798.7
2006 .....	50.7	648.6	699.3	143.0	17.9	860.2	8.0	21.3	889.5
2007 .....	51.9	703.2	755.1	199.7	18.0	972.8	6.2	61.5	1,040.6
Sep 07 .....	50.3	692.3	742.6	194.4	17.5	954.5	9.7	27.0	991.4
Oct 07 .....	50.1	696.0	746.0	208.2	17.3	971.6	11.0	24.1	1,006.8
Nov 07 .....	51.4	697.0	748.3	210.1	17.7	976.2	12.1	20.9	1,009.4
Dec 07 .....	51.9	703.2	755.1	199.7	18.0	972.8	6.2	61.5	1,040.6
Jan 08 .....	49.9	717.2	767.1	212.4	18.9	998.4	15.2	57.7	1,071.4
Feb 08 .....	50.1	720.6	770.7	212.1	20.5	1,003.3	18.5	102.9	1,124.8
Change compared with previous year, per cent									
2003 .....	...	...	8.8	...	...	8.8	...	...	11.3
2004 .....	...	...	14.4	...	...	12.7	...	...	2.7
2005 .....	...	...	19.9	...	...	14.7	...	...	14.3
2006 .....	...	...	8.7	...	...	10.8	...	...	11.4
2007 .....	...	...	8.0	...	...	13.1	...	...	17.0
Sep 07 .....	...	...	10.1	...	...	13.3	...	...	14.5
Oct 07 .....	...	...	9.5	...	...	12.6	...	...	13.1
Nov 07 .....	...	...	9.3	...	...	12.8	...	...	13.5
Dec 07 .....	...	...	8.0	...	...	13.1	...	...	17.0
Jan 08 .....	...	...	8.9	...	...	13.9	...	...	17.1
Feb 08 .....	...	...	10.5	...	...	13.6	...	...	22.3

<sup>1</sup> Notes and coin in circulation, excluding the banks' holdings.

SELECTED ITEMS FROM THE BALANCE SHEET OF THE BANKS

Table 6

End of period	Total balance	Assets					Liabilities	
		Lending to MFIs	Domestic lending			Holdings of securities	Loans from MFIs	Deposits
			Total	of which:				
				Households, etc.	Non-financial companies			
Kr. billion								
2003 .....	2,204.4	468.7	662.9	271.5	285.7	764.4	823.8	795.1
2004 .....	2,418.4	495.6	754.8	324.8	309.6	780.3	823.1	908.0
2005 .....	2,867.3	652.0	920.1	396.6	370.0	862.1	975.7	1,065.6
2006 .....	3,242.0	715.0	1,124.3	475.0	458.0	889.6	1,133.8	1,148.3
2007 .....	3,993.9	926.6	1,333.6	557.4	551.8	1,065.8	1,444.1	1,345.6
Sep 07 .....	3,790.4	870.0	1,249.1	527.4	517.4	1,010.5	1,283.1	1,304.0
Oct 07 .....	3,810.6	885.7	1,250.2	527.3	513.4	1,025.9	1,296.3	1,320.6
Nov 07 .....	3,893.2	902.9	1,280.7	533.8	532.7	1,026.6	1,339.1	1,330.3
Dec 07 .....	3,993.9	926.6	1,333.6	557.4	551.8	1,065.8	1,444.1	1,345.6
Jan 08 .....	4,028.7	941.0	1,331.0	547.2	544.6	1,091.3	1,385.5	1,393.1
Feb 08 .....	4,212.0	996.1	1,346.9	547.9	557.3	1,137.8	1,491.2	1,416.8
Change compared with previous year, per cent								
2003 .....	...	10.7	2.5	7.1	3.1	21.8	18.8	3.9
2004 .....	...	5.6	13.8	19.6	8.4	2.1	-0.1	14.2
2005 .....	...	31.7	21.9	22.1	19.5	10.5	18.5	17.3
2006 .....	...	9.7	22.2	19.8	23.8	3.2	16.2	7.8
2007 .....	...	29.6	18.6	17.4	20.5	19.8	27.4	17.2
Sep 07 .....	...	19.7	18.3	17.7	20.2	12.1	14.8	18.0
Oct 07 .....	...	30.3	17.8	17.4	19.8	11.9	22.6	17.4
Nov 07 .....	...	29.0	16.7	17.4	20.0	9.8	21.6	16.9
Dec 07 .....	...	29.6	18.6	17.4	20.5	19.8	27.4	17.2
Jan 08 .....	...	25.4	17.4	16.5	19.6	15.8	18.7	19.6
Feb 08 .....	...	41.4	16.6	15.3	18.6	11.6	21.8	23.1

Note: Excluding Danish banks' units abroad. As from 2003 the lending is affected by an addition to the group of banks. The calculation of the rate of increase has been amended accordingly.

SELECTED ITEMS FROM THE BALANCE SHEET OF  
 THE MORTGAGE-CREDIT INSTITUTES

Table 7

End of period	Assets						Liabilities	
	Total balance	Lending to MFIs	Domestic lending			Holdings of securities	Loans from MFIs	Bonds, etc. issued
			Total	of which:				
				Households, etc.	Non-financial companies			
Kr. billion								
2003 .....	1,863.8	100.9	1,394.6	1,072.1	284.4	342.6	32.6	1,729.0
2004 .....	2,097.4	91.2	1,489.9	1,141.3	307.9	481.2	26.1	1,952.5
2005 .....	2,519.9	101.4	1,664.4	1,281.5	334.2	645.0	151.7	2,237.0
2006 .....	2,699.9	245.1	1,834.8	1,407.7	370.8	574.1	226.5	2,297.9
2007 .....	3,088.2	362.8	2,015.5	1,532.5	420.8	649.2	344.2	2,495.2
Sep 07 .....	2,454.9	288.5	1,967.4	1,500.4	407.4	156.6	244.2	1,985.1
Oct 07 .....	2,479.6	276.5	1,983.0	1,509.3	414.4	171.5	249.6	2,017.1
Nov 07 .....	2,523.6	285.9	1,998.2	1,519.8	418.3	177.9	258.2	2,045.7
Dec 07 .....	3,088.2	362.8	2,015.5	1,532.5	420.8	649.2	344.2	2,495.2
Jan 08 .....	2,661.9	316.3	2,027.7	1,538.7	428.0	268.2	281.7	2,201.4
Feb 08 .....	2,632.1	307.5	2,040.7	1,547.6	431.1	227.7	285.6	2,162.9
Change compared with previous year, per cent								
2003 .....	...	30.6	8.5	8.5	9.7	1.2	-44.8	9.1
2004 .....	...	-9.6	6.8	6.5	8.3	40.4	-19.9	12.9
2005 .....	...	11.1	11.7	12.3	8.5	34.0	481.5	14.6
2006 .....	...	141.7	10.2	9.9	10.9	-11.0	49.3	2.7
2007 .....	...	48.0	9.9	8.9	13.5	13.1	52.0	8.6
Sep 07 .....	...	63.6	9.3	8.7	11.8	-4.4	76.8	5.8
Oct 07 .....	...	64.8	9.4	8.5	12.8	4.1	73.7	7.2
Nov 07 .....	...	57.0	9.3	8.3	13.0	-4.8	54.4	6.7
Dec 07 .....	...	48.0	9.9	8.9	13.5	13.1	52.0	8.6
Jan 08 .....	...	78.8	9.7	8.5	14.7	85.0	65.2	16.8
Feb 08 .....	...	62.3	9.7	8.4	14.5	56.7	59.8	13.5

LENDING TO RESIDENTS BY THE BANKS AND THE MORTGAGE-CREDIT INSTITUTES Table 8

End of period	Total lending			The banks' lending			The mortgage-credit institutes' lending		
	Total	Households, etc.	Business	Total	Households, etc.	Business	Total	Households, etc.	Business
	Kr. billion								
2003 .....	2,087.7	1,343.6	683.1	693.2	271.5	392.3	1,394.6	1,072.1	290.9
2004 .....	2,276.0	1,466.1	741.0	786.0	324.8	426.8	1,489.9	1,141.3	314.2
2005 .....	2,614.5	1,678.0	852.2	950.2	396.6	510.4	1,664.4	1,281.5	341.7
2006 .....	3,000.8	1,882.7	1,015.2	1,166.0	475.0	636.9	1,834.8	1,407.7	378.3
2007 .....	3,387.8	2,090.0	1,189.7	1,372.3	557.4	760.5	2,015.5	1,532.5	429.1
Sep 07 .....	3,252.4	2,027.8	1,121.0	1,285.0	527.4	705.4	1,967.4	1,500.4	415.5
Oct 07 .....	3,271.8	2,036.6	1,129.9	1,288.8	527.3	707.0	1,983.0	1,509.3	422.9
Nov 07 .....	3,317.5	2,053.6	1,158.4	1,319.3	533.8	731.8	1,998.2	1,519.8	426.5
Dec 07 .....	3,387.8	2,090.0	1,189.7	1,372.3	557.4	760.5	2,015.5	1,532.5	429.1
Jan 08 .....	3,397.4	2,085.9	1,202.4	1,369.6	547.2	766.2	2,027.7	1,538.7	436.2
Feb 08 .....	3,426.2	2,095.4	1,223.7	1,385.5	547.9	784.4	2,040.7	1,547.6	439.4
Change compared with previous year, per cent									
2003 .....	6.1	8.2	2.7	1.5	7.1	-1.7	8.5	8.5	9.3
2004 .....	9.0	9.1	8.5	13.4	19.6	8.8	6.8	6.5	8.0
2005 .....	14.9	14.5	15.0	20.9	22.1	19.6	11.7	12.3	8.8
2006 .....	14.8	12.2	19.1	22.7	19.8	24.8	10.2	9.9	10.7
2007 .....	12.9	11.0	17.2	17.7	17.4	19.4	9.9	8.9	13.4
Sep 07 .....	12.6	10.9	16.3	18.0	17.7	19.1	9.3	8.7	11.8
Oct 07 .....	12.2	10.7	15.4	16.8	17.4	17.0	9.4	8.5	12.8
Nov 07 .....	11.8	10.6	14.7	15.8	17.4	15.8	9.3	8.3	12.9
Dec 07 .....	12.9	11.0	17.2	17.7	17.4	19.4	9.9	8.9	13.4
Jan 08 .....	12.6	10.5	17.9	17.0	16.5	20.0	9.7	8.5	14.5
Feb 08 .....	12.3	10.2	17.3	16.3	15.3	19.1	9.7	8.4	14.4

Note: Including lending in Danish banks' units abroad. As from 2003 the banks' lending is affected by an addition to the group of banks. The calculation of the rate of increase has been amended accordingly.

THE MORTGAGE-CREDIT INSTITUTES' LENDING BROKEN DOWN BY TYPE Table 9

End of period	Index-linked lending	Fixed-rate lending	Adjustable-rate lending		Total	of which:		
			Total	of which =<1 year		Total	Lending in foreign currency	Instalment-free lending <sup>1</sup>
2003 .....	99.5	795.0	499.0	250.0	1,393.5	85.7	44.4	
2004 .....	94.6	733.9	659.8	382.2	1,488.4	84.9	170.5	
2005 .....	88.6	720.3	853.9	616.0	1,662.8	80.5	315.5	
2006 .....	83.5	797.5	951.7	720.5	1,832.7	85.7	432.2	
2007 .....	77.9	1,005.1	929.7	680.7	2,012.7	123.8	547.0	
Sep 07 .....	81.6	984.7	898.1	659.0	1,964.4	105.9	516.7	
Oct 07 .....	81.5	992.8	905.9	663.8	1,980.1	108.0	526.1	
Nov 07 .....	80.7	999.5	915.1	662.0	1,995.4	111.7	535.4	
Dec 07 .....	77.9	1,005.1	929.7	680.7	2,012.7	123.8	547.0	
Jan 08 .....	78.1	1,100.0	848.6	621.9	2,026.6	126.7	553.8	
Feb 08 .....	78.2	1,099.9	860.4	631.9	2,038.5	129.6	560.9	

Note: The Table includes the mortgage-credit lending to residents only, whereas Tables 7 and 8 include the institutes' total lending to residents.

<sup>1</sup> The mortgage-credit institutes' instalment-free lending to owner-occupied dwellings.

 THE BANKS' EFFECTIVE INTEREST RATES Table 10

	Lending				Deposits			
	All sectors	Households, etc.	Non-financial companies	Financial companies	All sectors	Households, etc.	Non-financial companies	Financial companies
Q4 05 .....	4.7	6.2	4.4	2.6	1.7	1.3	1.8	2.2
Q1 06 .....	4.8	6.2	4.5	2.8	1.9	1.5	2.0	2.4
Q2 06 .....	5.0	6.4	4.7	3.1	2.1	1.8	2.3	2.6
Q3 06 .....	5.2	6.6	5.0	3.3	2.4	2.1	2.5	2.8
Q4 06 .....	5.4	6.8	5.2	3.5	2.7	2.4	2.9	3.2
Q1 07 .....	5.7	7.1	5.5	3.6	3.1	2.8	3.2	3.4
Q2 07 .....	5.9	7.2	5.7	4.0	3.4	3.1	3.4	3.8
Q3 07 .....	6.1	7.4	6.0	4.1	3.6	3.3	3.6	4.0
Q4 07 .....	6.2	7.4	6.1	4.3	3.7	3.4	3.7	4.1
Sep 07 .....	6.2	7.5	6.0	4.2	3.6	3.3	3.6	4.0
Oct 07 .....	6.2	7.4	6.0	4.2	3.7	3.4	3.7	4.1
Nov 07 .....	6.2	7.4	6.1	4.3	3.7	3.4	3.7	4.1
Dec 07 .....	6.2	7.4	6.1	4.4	3.7	3.4	3.7	4.1
Jan 08 .....	6.2	7.4	6.2	4.4	3.7	3.4	3.7	4.1
Feb 08 .....	6.3	7.5	6.2	4.5	3.8	3.5	3.8	4.3

SELECTED ITEMS FROM THE BALANCE SHEET OF  
 THE INVESTMENT ASSOCIATIONS

Table 11

End of period	Total balance	Assets		Liabilities			
		Holdings of securities		Certificates issued by investment associations by owner			
		Bonds, etc.	Shares, etc.	Households, etc.	Insurance companies and pension funds	Other residents	Abroad
		Kr. billion					
2003 .....	367.1	237.2	108.7	188.2	103.2	60.4	12.3
2004 .....	574.2	326.5	164.6	213.1	163.4	180.1	15.3
2005 .....	794.7	412.1	286.4	265.7	236.5	263.0	24.4
2006 .....	924.7	431.8	385.4	294.3	289.4	305.3	28.8
2007 .....	1,021.2	477.9	411.6	295.2	339.2	322.1	29.2
Q4 06 .....	924.7	431.8	385.4	294.3	289.4	305.3	28.8
Q1 07 .....	952.2	437.2	393.6	297.2	302.6	312.0	29.6
Q2 07 .....	980.2	429.8	426.7	299.4	319.8	321.0	30.0
Q3 07 .....	1,002.2	442.6	428.8	299.8	340.9	322.8	31.1
Q4 07 .....	1,021.2	477.9	411.6	295.2	339.2	322.1	29.2
		Quarterly transactions, kr. billion					
Q4 06 .....	...	9.2	5.3	1.7	3.3	0.0	1.2
Q1 07 .....	...	7.5	1.3	-0.1	9.9	5.5	0.5
Q2 07 .....	...	5.5	9.2	2.6	12.8	6.8	-3.4
Q3 07 .....	...	17.7	8.4	-0.1	22.5	0.3	0.0
Q4 07 .....	...	40.1	2.8	-0.2	3.8	6.3	-2.7

## SECURITIES ISSUED BY RESIDENTS BY OWNER'S HOME COUNTRY

Table 12

End of period	Bonds, etc.						Shares	
	Total		of which:					
			Central-government securities		Mortgage-credit bonds			
	Denmark	Abroad	Denmark	Abroad	Denmark	Abroad		
Market value, kr. billion								
2003 .....	2,143.3	400.0	505.9	191.1	1,525.5	207.2	506.6	209.6
2004 .....	2,379.2	434.4	498.8	213.6	1,768.7	218.4	604.3	245.2
2005 .....	2,559.7	461.2	434.9	205.1	2,002.9	252.5	845.2	300.5
2006 .....	2,548.0	457.9	380.4	172.2	2,041.2	279.5	988.5	361.8
2007 .....	2,709.6	466.9	301.9	176.2	2,255.4	278.8	994.8	445.2
Sep 07 .....	2,234.1	463.5	327.8	175.8	1,777.9	278.4	1,099.8	457.0
Oct 07 .....	2,268.8	465.7	327.8	179.4	1,812.8	277.0	1,110.6	460.9
Nov 07 .....	2,287.3	470.7	312.9	179.4	1,839.3	278.9	1,024.3	442.3
Dec 07 .....	2,709.6	466.9	301.9	176.2	2,255.4	278.8	994.8	445.2
Jan 08 .....	2,343.5	443.9	320.2	169.8	1,880.7	261.0	887.3	397.1
Feb 08 .....	2,346.6	463.8	308.3	184.9	1,889.4	265.0	920.3	393.5

Note: Comprise quoted and unquoted securities registered with the VP Securities Services (VP).

HOUSEHOLDS' FINANCIAL ASSETS AND LIABILITIES

Table 13

End of period	Assets					Liabilities		
	Currency and bank deposits, etc.	Bonds, etc.	Shares and certificates issued by investment associations, etc.	Life-insurance and pension-scheme savings, etc.	Total	Loans, etc.	Net financial assets	Total
2002 .....	583	188	319	1,171	2,261	1,426	835	2,262
2003 .....	620	166	399	1,262	2,448	1,505	944	2,449
2004 .....	668	174	472	1,403	2,718	1,640	1,078	2,718
2005 .....	753	172	612	1,616	3,154	1,834	1,320	3,154
2006 .....	805	180	709	1,681	3,375	2,035	1,340	3,375
Q3 06 .....	789	175	672	1,643	3,278	1,981	1,298	3,279
Q4 06 .....	805	180	709	1,681	3,375	2,035	1,340	3,375
Q1 07 .....	822	177	728	1,694	3,422	2,090	1,332	3,422
Q2 07 .....	855	180	742	1,687	3,464	2,114	1,350	3,464
Q3 07 .....	861	186	740	1,707	3,495	2,160	1,335	3,495

COMPANIES' FINANCIAL ASSETS AND LIABILITIES

Table 14

End of period	Assets				Liabilities				
	Currency, bank deposits and granted credits, etc.	Bonds, etc.	Shares and certificates issued by investment associations, etc.	Total	Debt			Net financial assets	Total
					Loans, etc.	Bonds, etc. issued	Shares, etc. issued		
Kr. billion									
2002 .....	531	117	640	1,288	1,138	96	941	-886	1,288
2003 .....	664	121	643	1,428	1,159	109	1,131	-971	1,428
2004 .....	652	164	746	1,562	1,223	142	1,248	-1,051	1,562
2005 .....	742	167	972	1,879	1,358	143	1,489	-1,110	1,879
2006 .....	756	147	1,077	1,980	1,576	140	1,566	-1,301	1,980
Q3 06 .....	789	147	1,029	1,965	1,535	145	1,496	-1,212	1,965
Q4 06 .....	756	147	1,077	1,980	1,576	140	1,566	-1,301	1,980
Q1 07 .....	801	141	1,103	2,045	1,652	139	1,624	-1,370	2,045
Q2 07 .....	902	140	1,154	2,198	1,679	134	1,735	-1,349	2,198
Q3 07 .....	941	136	1,171	2,248	1,684	120	1,793	-1,348	2,248

Note: Companies are defined as non-financial companies.

## CURRENT ACCOUNT OF THE BALANCE OF PAYMENTS (NET REVENUES)

Table 15

	Goods (fob)	Services	Goods and services	Wages and property income	Current transfers	Total current account
	Kr. billion					
2003 .....	65.9	23.2	89.2	-16.8	-24.0	48.3
2004 .....	54.5	19.8	74.4	-2.4	-27.7	44.2
2005 .....	44.5	38.3	82.8	10.0	-25.0	67.7
2006 .....	15.7	42.5	58.2	16.0	-27.3	46.9
2007 .....	-4.7	41.2	36.5	10.7	-26.7	20.5
Mar 06 - Feb 07 .....	8.9	42.3	51.2	12.5	-27.8	36.0
Mar 07 - Feb 08 .....	-4.4	41.0	36.5	11.4	-24.3	23.7
Sep 07 .....	0.5	4.5	5.0	-0.2	-2.2	2.6
Oct 07 .....	-0.8	4.9	4.1	1.7	-1.4	4.4
Nov 07 .....	1.1	3.0	4.1	1.1	-1.6	3.6
Dec 07 .....	-3.0	3.3	0.4	0.8	-1.4	-0.3
Jan 08 .....	-2.5	2.2	-0.3	0.6	-2.0	-1.7
Feb 08 .....	-0.1	2.2	2.1	-0.1	-2.0	0.0

Note: As of 2005 the compilation is based on new sources and methodologies resulting in breaks in data.

**FINANCIAL ACCOUNT OF THE BALANCE OF PAYMENTS  
(NET PAYMENTS FROM ABROAD)**

Table 16

	Current account and capital account, etc., total	Capital import				Other <sup>1</sup>	Danmarks Nationalbank's transactions with abroad <sup>2</sup>
		Direct investments		Portfolio investments	Other capital import		
		Danish abroad	Foreign in Denmark				
Kr. billion							
2003 .....	48.3	-8.0	17.8	-98.3	72.5	-1.5	30.8
2004 .....	44.4	62.1	-62.6	-87.1	-22.5	59.4	-6.2
2005 .....	70.6	-97.1	77.3	-67.6	23.7	-18.6	-11.8
2006 .....	46.9	-50.5	21.5	-110.9	82.4	-27.7	-38.3
2007 .....	20.9	-92.5	61.1	-52.3	50.2	11.4	-1.2
Mar 06 - Feb 07 .....	35.9	-69.0	-2.0	-66.4	107.0	-8.2	-2.7
Mar 07 - Feb 08 .....	24.1	-90.0	71.6	14.9	-24.1	9.1	5.6
Sep 07 .....	2.7	-13.4	11.5	13.9	-42.5	18.7	-9.0
Oct 07 .....	4.4	-3.2	10.1	-44.1	45.0	-14.8	-2.6
Nov 07 .....	3.6	-4.3	10.3	-7.5	-6.7	3.4	-1.1
Dec 07 .....	-0.2	9.4	0.4	-61.8	58.6	-18.3	-12.0
Jan 08 .....	-1.6	-14.9	15.3	4.4	20.9	-16.2	7.9
Feb 08 .....	0.0	-17.5	4.5	20.4	-13.9	11.2	4.7

<sup>1</sup> Including errors and omissions and until end-December 2004 unrecorded trade credits.

<sup>2</sup> As from 2005 transactions on all Danmarks Nationalbank's accounts with abroad. Until end-2004 only transactions on accounts included by compilation of the foreign-exchange reserve, published by press release on the 2nd banking day of each month and included in Table 2 of this section.

**PORTFOLIO INVESTMENTS OF THE BALANCE OF PAYMENTS  
(NET PAYMENTS FROM ABROAD)**

Table 17

	Danish securities			Foreign securities		Total
	Krone-denominated bonds, etc.	Foreign currency denominated bonds, etc.	Shares	Bonds, etc.	Shares	
				Kr. billion		
2003 .....	-30.3	66.3	9.1	-121.5	-21.9	-98.3
2004 .....	-6.2	56.9	9.7	-104.4	-43.0	-87.1
2005 .....	20.8	122.5	-19.2	-107.5	-84.3	-67.6
2006 .....	9.4	69.3	-34.6	-21.8	-133.2	-110.9
2007 .....	23.2	65.4	13.8	-104.3	-50.4	-52.3
Sep 07 .....	13.2	7.9	-0.4	-0.7	-6.0	13.9
Oct 07 .....	-1.2	-0.6	0.2	-37.6	-5.0	-44.1
Nov 07 .....	-8.3	16.6	-2.9	-19.6	6.8	-7.5
Dec 07 .....	1.1	-27.0	-0.5	-35.8	0.4	-61.8
Jan 08 .....	-23.1	13.8	-1.7	10.6	4.8	4.4
Feb 08 .....	20.1	3.8	2.1	-3.1	-2.6	20.4

Note: A negative sign (-) indicates residents' net purchase of foreign securities, or non-residents' net sale of Danish securities.

DENMARK'S EXTERNAL ASSETS AND LIABILITIES

Table 18

End of period	Direct investments		Portfolio investments		Financial derivatives, net	Other investments			Danmarks Nationalbank	Total
	Equity	Inter-company debt, etc.	Shares, etc.	Bonds, etc.		Trade credits	Loans and deposits	Other		
	Kr. billion									
<b>Assets</b>										
2003 .....	413	198	309	446	17	57	518	31	230	2,221
2004 .....	471	220	369	547	48	34	584	20	223	2,515
2005 .....	567	253	556	684	85	37	720	19	217	3,136
2006 .....	589	255	739	669	47	41	826	30	178	3,374
2007 .....	627	284	791	741	7	48	1,049	32	176	3,754
Q4 06 .....	589	255	739	669	47	41	826	30	178	3,374
Q1 07 .....	624	255	802	653	19	46	881	31	185	3,496
Q2 07 .....	630	279	821	683	-2	49	943	29	181	3,613
Q3 07 .....	628	292	824	664	7	47	1,035	31	191	3,719
Q4 07 .....	627	284	791	741	7	48	1,049	32	176	3,754
<b>Liabilities</b>										
2003 .....	434	162	186	762	...	28	801	13	4	2,391
2004 .....	429	208	241	857	...	20	816	20	2	2,593
2005 .....	503	231	311	1,019	...	27	968	22	3	3,082
2006 .....	496	270	358	1,059	...	32	1,138	34	4	3,391
2007 .....	518	266	428	1,113	...	36	1,414	36	5	3,816
Q4 06 .....	496	270	358	1,059	...	32	1,138	34	4	3,391
Q1 07 .....	504	277	387	1,125	...	33	1,221	35	1	3,583
Q2 07 .....	514	268	425	1,141	...	34	1,246	34	1	3,663
Q3 07 .....	524	256	440	1,138	...	32	1,309	37	3	3,738
Q4 07 .....	518	266	428	1,113	...	36	1,414	36	5	3,816
<b>Net assets</b>										
2003 .....	-21	36	123	-315	17	29	-283	19	226	-170
2004 .....	42	12	128	-310	48	14	-233	0	221	-78
2005 .....	64	22	245	-335	85	10	-248	-3	214	54
2006 .....	93	-15	381	-390	47	9	-312	-4	174	-17
2007 .....	109	17	362	-373	7	13	-364	-5	171	-62
Q4 06 .....	93	-15	381	-390	47	9	-312	-4	174	-17
Q1 07 .....	120	-22	415	-472	19	13	-340	-4	184	-87
Q2 07 .....	116	11	396	-459	-2	15	-303	-5	180	-50
Q3 07 .....	104	36	384	-474	7	15	-274	-6	188	-19
Q4 07 .....	109	17	362	-373	7	13	-364	-5	171	-62

Note: As a key principle, the market value has been used for the compilation.

## GDP BY TYPE OF EXPENDITURE

Table 19

	Final domestic demand						Exports of goods and services	Imports of goods and services
	GDP	Private consumption	General-government consumption	Gross fixed capital formation	Change in inventories	Total		
2003 .....	1,400.7	666.9	371.2	271.8	3.2	1,313.1	635.1	547.6
2004 .....	1,466.2	707.2	389.0	285.0	13.5	1,394.8	665.0	593.6
2005 .....	1,548.2	759.8	401.3	306.9	3.8	1,471.8	761.6	685.2
2006 .....	1,641.5	805.2	421.2	357.1	13.0	1,596.5	851.1	806.0
2007 .....	1,696.2	841.0	439.2	389.3	7.3	1,676.8	884.4	864.9
Q4 06 .....	424.8	210.4	109.1	98.2	1.1	418.9	221.6	215.6
Q1 07 .....	406.7	203.0	106.7	91.8	4.4	405.9	210.6	209.8
Q2 07 .....	420.5	207.9	108.9	95.8	2.8	415.3	215.8	210.7
Q3 07 .....	424.0	205.4	109.2	96.0	3.5	414.1	224.4	214.5
Q4 07 .....	445.0	224.7	114.4	105.7	-3.3	441.4	233.5	229.9
Real growth compared with previous year, per cent								
2003 .....	0.4	1.0	0.7	-0.2	...	0.0	-1.0	-1.6
2004 .....	2.3	4.7	1.8	3.9	...	4.4	2.8	7.7
2005 .....	2.5	5.2	0.9	6.1	...	3.5	8.3	11.3
2006 .....	3.9	3.8	2.0	14.0	...	6.1	9.0	14.1
2007 .....	1.8	2.5	1.7	6.2	...	2.7	3.7	5.6
Q4 06 .....	3.5	2.9	1.8	13.6	...	6.0	8.4	13.1
Q1 07 .....	3.8	1.0	2.1	17.3	...	5.1	6.7	8.8
Q2 07 .....	-0.1	0.8	1.4	0.8	...	0.7	1.1	2.5
Q3 07 .....	1.7	3.4	1.0	3.6	...	2.5	3.9	5.7
Q4 07 .....	1.9	4.5	2.3	4.9	...	2.7	3.3	5.6
Real growth compared with previous quarter (seasonally adjusted), per cent								
Q4 06 .....	-0.1	1.1	0.1	-0.2	...	0.6	2.0	3.1
Q1 07 .....	1.0	1.4	0.7	5.1	...	2.1	0.8	0.5
Q2 07 .....	-1.1	-0.6	-0.1	-6.0	...	-1.8	-1.5	-1.0
Q3 07 .....	1.7	1.3	0.3	4.7	...	1.8	2.7	3.1
Q4 07 .....	0.3	2.4	1.3	1.2	...	1.8	1.3	2.8

EU-HARMONIZED INDEX OF CONSUMER PRICES (HICP) AND  
 UNDERLYING INFLATION (IMI)

Table 20

	HICP							Index of net retail prices <sup>1</sup>			
	Total	Energy	Food	Core inflation <sup>2</sup>	Administered prices		HICP excl. energy, food and administered prices <sup>3</sup>	Index of net retail prices excl. energy, food and administered prices <sup>3</sup>	Split into <sup>4</sup> :		
					Rent	Public services			Import content <sup>5</sup>	IMI <sup>6</sup>	
	Weights, per cent										
	100	10.8	19.6	69.6	7.7	4.5	57.4	50.7	16.2	34.5	
	Year-on-year growth, per cent										
2003 .....	2.0	0.9	0.7	2.6	2.7	8.1	2.1	1.9	0.4	2.6	
2004 .....	0.9	2.6	-2.1	1.5	2.8	4.8	1.1	0.8	1.1	0.6	
2005 .....	1.7	7.6	1.0	1.0	2.4	3.2	0.6	0.7	3.4	-0.6	
2006 .....	1.9	5.3	2.2	1.2	2.1	0.9	1.1	1.3	3.1	0.4	
2007 .....	1.7	0.3	3.7	1.3	2.1	0.6	1.2	1.4	1.4	1.4	
Q1 05 .....	1.1	4.6	0.3	0.7	2.4	4.0	0.2	0.3	2.8	-0.9	
Q2 05 .....	1.6	6.7	0.6	1.0	2.3	3.2	0.7	0.7	3.5	-0.6	
Q3 05 .....	2.2	10.1	1.5	1.1	2.3	3.0	0.8	0.8	3.9	-0.6	
Q4 05 .....	2.0	8.9	1.5	1.0	2.3	2.6	0.7	0.9	3.3	-0.2	
Q1 06 .....	2.0	8.9	0.9	1.2	2.2	2.6	1.0	1.1	3.7	-0.1	
Q2 06 .....	2.0	8.3	1.9	1.0	2.0	0.4	1.0	1.1	3.8	-0.2	
Q3 06 .....	1.8	3.9	2.6	1.3	2.0	0.2	1.2	1.6	3.2	0.8	
Q4 06 .....	1.6	0.4	3.5	1.3	2.0	0.4	1.3	1.3	1.9	1.0	
Q1 07 .....	1.9	1.1	4.1	1.3	2.0	0.3	1.3	1.3	1.7	1.1	
Q2 07 .....	1.5	-1.7	3.6	1.5	2.1	0.2	1.5	1.4	0.9	1.7	
Q3 07 .....	1.0	-1.4	2.0	1.2	2.2	0.8	1.0	1.2	0.9	1.4	
Q4 07 .....	2.2	3.3	5.2	1.2	2.0	1.0	1.2	1.6	2.0	1.4	

Note: The weights reflect the weighting basis as of January 2006.

<sup>1</sup> Prices in the index of net retail prices are compiled excluding indirect taxes and subsidies.

<sup>2</sup> Core inflation is defined as the increase in HICP excluding energy and food.

<sup>3</sup> Goods and services excluding energy, food and administered prices constitute 57.4 per cent of HICP's weight basis and 50.7 per cent of the index of net retail prices. The difference reflects that the same goods and services do not count equally in the two indices, and does not express the indirect taxation content of the consumer prices.

<sup>4</sup> The division of the index of net retail prices into import and IMI is based on Statistics Denmark's input-output table.

<sup>5</sup> The indirect energy content is included in the import content.

<sup>6</sup> IMI expresses the domestic market-determined inflation. For a detailed presentation of IMI, see Bo William Hansen and Dan Knudsen, Domestic Market-Determined Inflation, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 2005.

## SELECTED MONTHLY ECONOMIC INDICATORS

Table 21

	Unemployment Per cent of labour force	Quantity index		Forced sales of real property	New passen- ger car registra- tions	Con- sumer confi- dence indicator	Composite cyclical indicator for		
		Manu- facturing industry, 2000=100	Retail trade 2000=100				Manu- facturing industry	Building and construc- tion	Service
2003 .....	5.7	102.5	107.8	3,039	96,501	1	-6	-18	-2
2004 .....	5.8	102.1	113.4	2,640	122,543	7	3	-5	13
2005 .....	5.1	103.8	120.1	1,874	148,578	9	1	7	20
2006 .....	3.9	108.0	124.0	1,231	156,718	10	9	21	24
2007 .....	2.8	112.6	125.1	1,392	162,475	7	4	9	20
Seasonally adjusted									
Oct 07 .....	2.3	116.5	125.9	126	14,487	5	3	6	20
Nov 07 .....	2.2	113.8	126.2	127	15,001	6	2	3	18
Dec 07 .....	2.1	110.6	126.6	119	14,201	5	5	3	19
Jan 08 .....	2.1	114.3	126.1	123	15,397	-4	6	0	16
Feb 08 .....	2.0	115.4	128.6	183	14,538	-2	-4	-1	11
Mar 08 .....	...	...	...	159	...	0	-2	-3	11

<sup>1</sup> Excluding shipbuilding.

## SELECTED QUARTERLY ECONOMIC INDICATORS

Table 22

	Employment		Hourly earnings			Property prices (purchase sum, one-family dwellings)  As a percentage of property value 1995
	Total	Private	All sectors in Denmark, total	Manufacturing industry in Denmark	Manufacturing industry abroad	
	1,000 persons		1996=100			
2003 .....	2,756	1,914	133.3	133.8	124.1	173.2
2004 .....	2,739	1,898	137.4	138.0	127.5	188.6
2005 .....	2,763	1,919	141.4	141.8	130.7	221.9
2006 .....	2,808	1,965	145.8	146.2	134.0	269.7
2007 .....	2,858	2,014	151.3	152.0	137.3	...
Seasonally adjusted						
Q4 06 .....	2,828	1,982	147.4	147.9	135.1	276.2
Q1 07 .....	2,852	2,007	148.9	149.3	136.3	280.5
Q2 07 .....	2,847	2,003	150.2	151.3	136.8	283.9
Q3 07 .....	2,862	2,018	152.3	152.7	137.6	283.1
Q4 07 .....	2,871	2,027	153.7	154.5	138.5	...
Change compared with previous year, per cent						
2003 .....	-1.1	-1.2	3.7	4.2	3.0	3.1
2004 .....	-0.6	-0.8	3.1	3.1	2.7	8.9
2005 .....	0.9	1.1	2.9	2.7	2.5	17.6
2006 .....	1.6	2.4	3.1	3.1	2.5	21.6
2007 .....	1.8	2.5	3.8	3.9	2.5	...
Q4 06 .....	2.0	2.6	3.1	3.2	2.6	14.9
Q1 07 .....	2.2	2.9	3.3	3.4	2.6	10.1
Q2 07 .....	1.5	2.2	3.7	3.9	2.4	4.9
Q3 07 .....	1.9	2.7	4.0	4.2	2.4	2.1
Q4 07 .....	1.5	2.3	4.3	4.5	2.5	...

## EXCHANGE RATES

Table 23

	EUR	USD	GBP	SEK	NOK	CHF	JPY
	Kroner per 100 units						
	Average						
2003 .....	743.07	658.99	1,074.99	81.45	93.03	488.88	5.6840
2004 .....	743.98	598.93	1,096.69	81.54	88.90	481.96	5.5366
2005 .....	745.19	600.34	1,090.02	80.29	93.11	481.30	5.4473
2006 .....	745.91	594.70	1,094.32	80.62	92.71	474.22	5.1123
2007 .....	745.06	544.56	1,089.81	80.57	92.99	453.66	4.6247
Oct 07 .....	745.34	523.90	1,070.69	81.25	96.85	446.15	4.5190
Nov 07 .....	745.43	507.70	1,051.63	80.25	93.76	452.20	4.5772
Dec 07 .....	745.99	511.99	1,036.87	79.12	93.07	449.62	4.5649
Jan 08 .....	745.05	506.24	997.10	79.00	93.65	459.86	4.6967
Feb 08 .....	745.40	505.49	992.68	79.61	93.79	463.56	4.7191
Mar 08 .....	745.59	480.12	962.55	79.31	93.63	474.15	4.7560

## EFFECTIVE KRONE RATE

Table 24

	Nominal effective krone rate	Consumer-price indices		Real effective krone rate based on consumer prices	Real effective krone rate based on hourly earnings	Consumer-price index in the euro area
		Denmark	Abroad			
Average	1980=100					2005=100
2003 .....	101.2	234.7	220.3	107.9	108.4	95.8
2004 .....	102.2	237.4	224.0	108.3	109.8	97.9
2005 .....	101.6	241.7	228.2	107.7	109.4	100.0
2006 .....	101.6	246.2	232.5	107.7	110.2	102.2
2007 .....	103.2	250.5	237.7	108.7	113.4	104.4
Oct 07 .....	103.7	251.5	239.5	108.7	...	105.2
Nov 07 .....	104.5	253.2	240.7	109.6	...	105.8
Dec 07 .....	104.6	253.0	240.9	110.0	115.2	106.2
Jan 08 .....	105.1	253.7	241.2	110.4	...	105.8
Feb 08 .....	105.0	256.8	242.2	111.1	...	106.2
Mar 08 .....	106.1	...	...	...	...	...
Change compared with previous year, per cent						
2003 .....	3.6	2.1	1.7	3.9	4.7	2.1
2004 .....	1.0	1.2	1.7	0.4	1.3	2.1
2005 .....	-0.6	1.8	1.8	-0.6	-0.3	2.2
2006 .....	0.0	1.9	1.9	0.1	0.7	2.2
2007 .....	1.6	1.7	2.2	0.9	2.9	2.1
Oct 07 .....	1.8	1.7	2.5	0.6	...	2.6
Nov 07 .....	2.5	2.5	3.0	1.7	...	3.1
Dec 07 .....	2.3	2.3	2.8	1.9	3.9	3.1
Jan 08 .....	3.0	2.9	3.1	2.6	...	3.2
Feb 08 .....	2.6	3.1	3.1	2.4	...	3.3
Mar 08 .....	3.2	...	...	...	...	...

Note: The nominal effective krone rate index is a geometric weighting of the development in the Danish krone rate against currencies of Denmark's 27 most important trading partners. However, only 25 countries are included in the calculation of consumer prices abroad and the real effective krone rate based on consumer prices and hourly earnings, respectively.

The weights are based on trade in manufactured goods in 2002.

An increase in the index reflects a nominal or a real appreciation of the krone.

# Danmarks Nationalbank's Statistical Publications

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## **Periodical publications (electronic publications)**

Upon compilation of financial statistics, Danmarks Nationalbank releases these to the public in electronic publications. The publication of new statistics on a specific topic comprises 2 elements:

- **"Nyt" (News)** with text and charts to illustrate key development trends, as well as a 1-2 page tables section. The contents of the "Nyt" publications will also include in-depth commentary in order to give users greater scope to interpret and apply the statistics.
- **Tabeltillæg (Tables Supplement)** containing tables with detailed specifications and descriptions of the sources and methodologies applied in the compilation of the statistics.

The text of all tables and charts as well as the descriptions of the sources and methodologies are translated into English.

## **Statistics databank**

The above statistical publications are supplemented by a statistics database that comprises all time series included in the financial statistics. When a topic is published the corresponding time series are updated, and they include data as far back in time as possible. As from 1 October 2007 Statistics Denmark and Danmarks Nationalbank have entered into a cooperation according to which the statistical data from Danmarks Nationalbank are published through Statistics Denmark's "StatBank Denmark". Danmarks Nationalbank's part of the "StatBank Denmark" is available directly via: [nationalbanken.statbank.dk](http://nationalbanken.statbank.dk).

## **Special Reports**

In Special Reports are published statistics of a thematic character that are not prepared on a regular basis.

## **Release calendar**

A release calendar for the statistical publications, covering the current month and the following quarter, is shown on the website.