Danmarks Nationalbank

Monetary Review 2nd Quarter

2007

DANMARKS NATIONAL BANK 2007

MONETARY REVIEW 2nd QUARTER 2007

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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The article investigates how much and how fast the banks change their interest rates when Danmarks Nationalbank adjusts its monetary-policy interest rates. The results show that the banks follow suit relatively quickly and that the pass-through from Danmarks Nationalbank's interest rates to the banks' interest rates is generally high.

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A strong decline in IMF lending has eroded the IMF's income base. As a result, the IMF is investigating new financing models, not least to finance the surveillance that contributes to macroeconomic and financial stability and crisis prevention. In January 2007, an external committee proposed a new IMF financing model and new sources of income, including investment of a part of the member countries' quota resources and investment of the proceeds from the sale of a part of the IMF's gold.

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Recent Economic and Monetary Trends

This review covers the period from mid-February 2007 to mid-May 2007

Growth in the global economy is higher and more broadly based than before. US growth has slackened off, but the upswing in Europe and many other parts of the world has gained momentum. Global growth has been exceptionally high since 2004 and the strong development is set to continue. Stock prices have continued to rise after their sharp dive in late February, and long-term interest rates and commodity prices have risen in recent months. Despite the high global growth, consumer price inflation remains moderate.

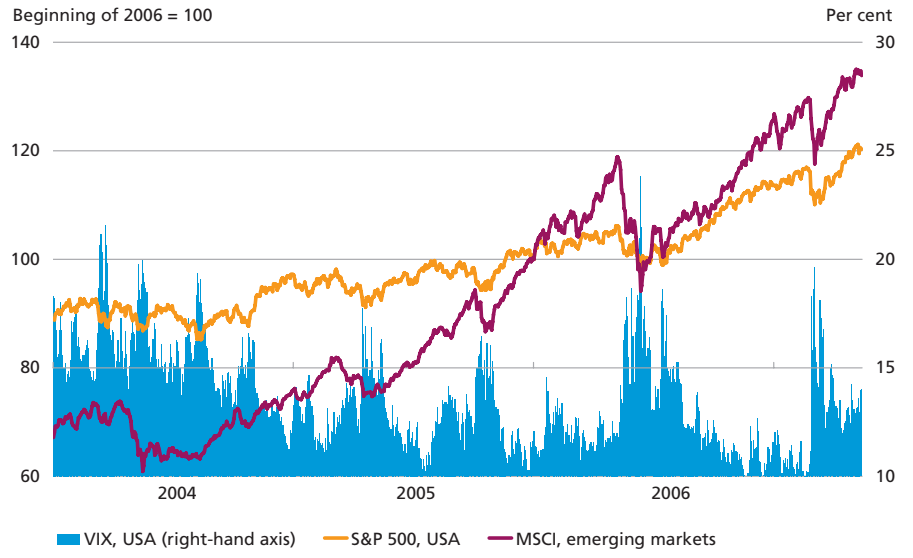
The Danish economy is still booming. Employment has never been higher, and unemployment has fallen to the lowest level since the early 1970s. Many companies face difficulties in attracting the necessary labour. The capacity pressure has triggered a substantial expansion of the capital stock, imports are growing strongly, and the trade and current-account surpluses are diminishing rapidly. Variations in demand and its composition will be reflected in fluctuations in the current account of the balance of payments to a greater extent than is normally the case. The shortage of labour and high growth in imports indicate that for all practical purposes the economy has reached its capacity limit. The prospects of higher growth among Denmark's key trading partners are favourable for exports, so even though the rate of consumption growth has declined, the overall demand in the economy is high. The capacity pressure will thus be sustained.

INTERNATIONAL COMMODITY AND FINANCIAL MARKETS

Prices of oil and other commodities have begun to rise again, primarily because the global growth has augmented the demand for commodities. The oil price reached almost 70 dollars per barrel (Brent) in April, in the wake of announcements of falling production. In mid-May, the price was 66 dollars per barrel. The prices of most metals have continued to rise, but are extremely volatile. The price per tonne of nickel is just over 15,000 dollars higher than at the turn of the year, which is equivalent to an increase by almost 45 per cent. This is attributable to lower stocks.

STOCK INDICES FOR THE USA AND EMERGING MARKETS, AND IMPLIED VOLATILITY IN THE USA

Chart 1



Note: The VIX index measures implied volatility in the US S&P 500 index. This index is calculated on the basis of prices for options on the S&P 500 index. A high value of the VIX index indicates great uncertainty concerning the future price development, and thus high risk for investors.

Source: EcoWin.

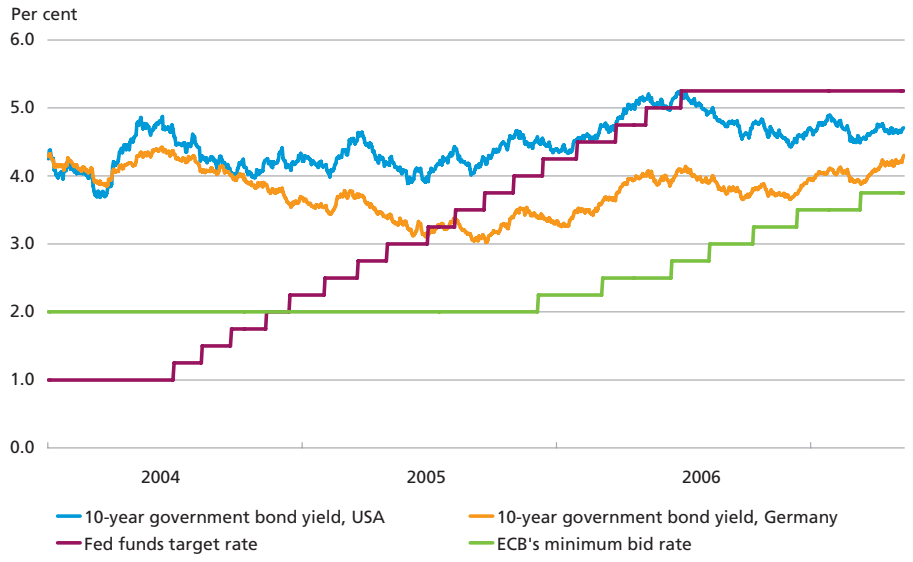
International stock prices fell considerably at the end of February, cf. Chart 1. Prices in the higher-risk markets fell most, just as they did during the stock-market unrest in May 2006. The price drops began with a slump in the Chinese stock market, but since there were fears of a more pronounced dampening of US growth than previously expected, stocks fell on most exchanges. In the USA, there were concerns about the ability of homeowners with low credit standing to meet their payment obligations in the mortgage-credit market, cf. below. In step with the growing uncertainty, the implied volatility of the stock-option prices increased.

In the course of the spring, investor concerns about the future development in stock prices diminished, and prices have more or less recovered the lost ground.

Long-term yields have generally mirrored the development in stock prices. In view of improved growth prospects in Germany, the yield on the German 10-year government bond in April reached the highest level since mid-2004, cf. Chart 2. Since the summer of 2006, the spread between long-term yields in the USA and Germany has narrowed by around 70 basis points to 0.4 per cent.

OFFICIAL INTEREST RATES AND LONG-TERM INTEREST RATES IN THE USA AND THE EURO AREA

Chart 2



Source: EcoWin.

Since the turn of the year, the euro has strengthened further against the US dollar and the Japanese yen. On 15 May the exchange rate was 1.36 dollars per euro, which is a weakening of the dollar by 6 per cent from the level one year earlier. The spread between the official interest rates in the euro area and the USA has narrowed further after the ECB raised its interest rates in March. The yen's weakening partly reflects unhedged speculation in interest-rate differences, i.e. "carry trades"[1], whereby investors borrow in yen at a low rate of interest and invest in currencies that pay higher interest rates, among them the euro.

INERNATIONAL ECONOMIC DEVELOPMENT

USA

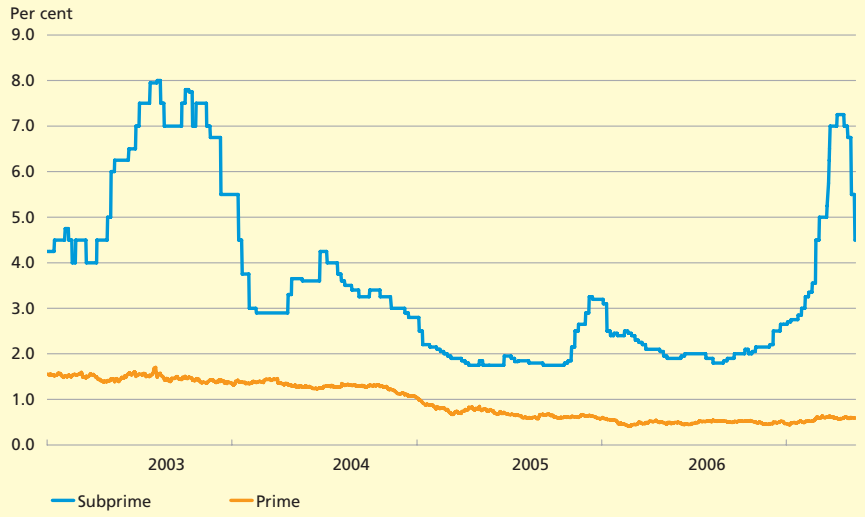
Economic growth in the USA has abated since the summer of 2006 after several years of strong growth. According to preliminary national accounts data, real GDP grew by 0.3 per cent in the 1st quarter of 2007. This was an increase in GDP by 2.1 per cent from the same quarter of 2006. House prices have stagnated at a high level and were on average

[1] See also Box 2 in Danmarks Nationalbank, *Financial stability*, 2007.

SUBPRIME US HOUSING LOANS[1] Box 1

In mid-February, following the rise in interest rates and the slowdown in the US housing market, attention focused on the increase in loans defaulted by less creditworthy borrowers in the US mortgage-credit market, i.e. subprime loans. A number of credit institutions specialising in subprime loans have incurred financial problems. This has led to speculation as to whether the problems might spread to other markets and lead to a general credit tightening. The spread between variable-rate subprime bonds and the money-market interest rate widened considerably, cf. Chart 3. However, the influence on the yield spread to secure (prime) mortgage-credit bonds has been only limited.

US YIELD SPREADS Chart 3



Note: The subprime yield spread is the spread between yields on variable-rate securities issued on the basis of home equity loans with BBB- rating and the money-market interest rate, expressed as the 1-month Libor. The prime spread is the yield spread between secure (prime) fixed-rate 30-year mortgage-credit bonds and 10-year government securities.
Source: JPMorgan.

Subprime loans are issued to borrowers that are not considered eligible for normal (prime) mortgage-credit loans. A personal credit assessment is required in order to obtain a loan under the US mortgage-credit system, and the credit assessment is important in determining the yield to maturity of the housing loan. A low credit rating may be assigned if the borrower for example has limited or poor credit (defaulted loans), a relatively high debt-to-income ratio and/or the home is heavily mortgaged. These and other characteristics are included in the credit institutions' statistical models – known as credit score models – that apply historical links between these characteristics and loan defaults to assess the borrowers' creditworthiness. A certain minimum score is required to be eligible for a prime loan.

Around 75 per cent of the outstanding mortgage-credit loans are prime loans, i.e. loans granted to borrowers with a high credit standing. The volume of subprime loans has increased in recent years, to around 14 per cent of all outstanding US mortgage-credit loans at the end of 2006. In addition, there is an intermediate loan category,

CONTINUED Box 1

Alt-A loans, granted to borrowers with a good credit history that do not qualify as prime borrowers due to lack of documentation and/or the size of the mortgage debt as a ratio of their income or the value of the home. Alt-A loans account for around 12 per cent of the outstanding mortgage-credit loans.

The growth in subprime loans in the US mortgage-credit market in recent years is primarily attributable to the low level of interest rates and the buoyant housing market. These factors have considerably increased the demand for housing loans, as well as the interest in granting them. As a result, credit standards for borrowers have been weakened, loan limits raised, credit risk increased and new mortgage-credit products introduced. Much of the recent growth in subprime loans has concerned loans at variable interest rates, for which the interest rate is lowered in an introductory period and then raised. Borrowers with such loans are particularly severely hit by rising interest rates if the latter coincide with the expiry of the introductory period. Around 85 per cent of the subprime loans are at variable interest rates, compared with less than 20 per cent of the prime loans. This has made the subprime market vulnerable to rising interest rates and a housing market that is cooling off, since borrowers are more exposed and have fewer options to alleviate payment problems by raising supplementary mortgage-credit loans or selling the home.

More than half of all subprime loans are financed by issuing asset-backed securities. These securities are split into segments, or tranches, that differ in terms of when a suspension of payments on the underlying loan is reflected in payments on the securities. Securities in the various risk tranches can then be sold to investors with different risk appetites. Calculations show that more than 90 per cent of the securities issued on the basis of subprime loans in 2006 will only incur losses if housing prices fall by 4 per cent annually over the next five years. The reason is that investors in these securities are protected against credit losses by one or more underlying tranches.

Subprime loans also exist in e.g. the UK, Canada and Australia, but are virtually non-existent in other countries. In some countries this is due to consumer protection legislation that limits the interest rates on housing loans so that they cannot reach a level that is sufficiently high to compensate for the risk associated with granting subprime loans.

[1] For a more detailed description, see e.g. Toger T. Cole, Mortgage markets, Testimony before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, 22 March 2007, BIS Committee on the Global Financial System (2006), Housing finance in the global financial market, CGFS working group report, IMF (2007), Global financial stability report, April and Elizabeth Laderman (2001), Subprime mortgage lending and the capital market, FRBSF Economic Letter, No. 38.

0.3 per cent lower in March than one year before. Residential investments have declined substantially in the last four quarters. In mid-February, there was focus on the rising number of loans defaulted by less creditworthy homeowners in the "subprime" US mortgage-credit market, cf. Box 1. The situation in this market has stabilised since then, which supports the widespread expectations that the housing market's adjustment after the boom in previous years will be moderate and gradual. Analyses of the criteria for the banks' lending indicate that in

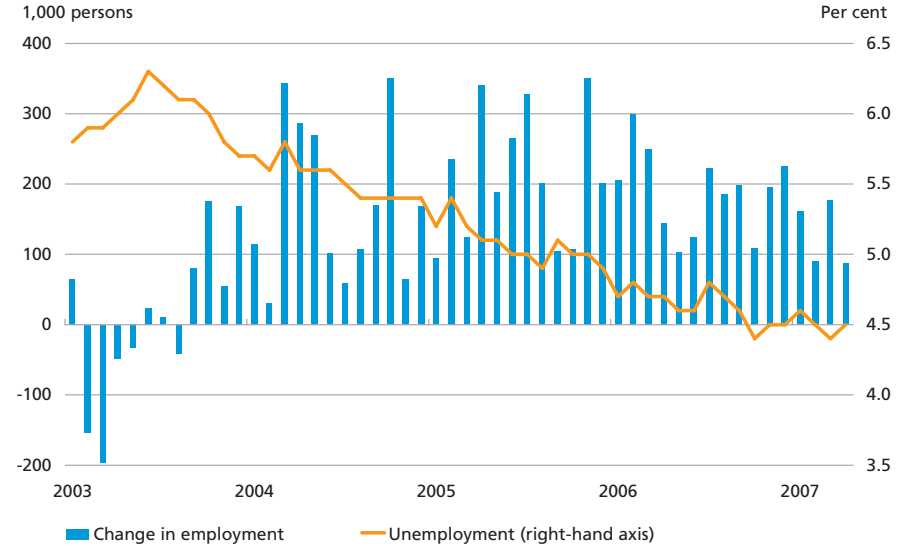
recent months the banks have tightened their credit standards for approval of mortgage loans to the subprime market, but this has only affected loans to more creditworthy borrowers on a limited scale, and the standards for approval of credit card loans have generally been eased.

Even though the housing market has slowed down, private consumption has shown only limited signs of weakness. On the other hand, the growth in corporate investments has been modest. The development in consumption and corporate investments is reflected in the confidence indicators. Consumer confidence is riding high, while business confidence as measured by the Institute for Supply Management (ISM) for the manufacturing sector is only just above the neutral level of 50.

The deficit on the US balance of goods and services was 181 billion dollars in the 1st quarter, equivalent to 5.3 per cent of GDP, compared to 6.0 per cent in the 3rd quarter of 2006. The improved balance of goods and services is due especially to lower imports as a result of declining economic growth and the dollar's depreciation.

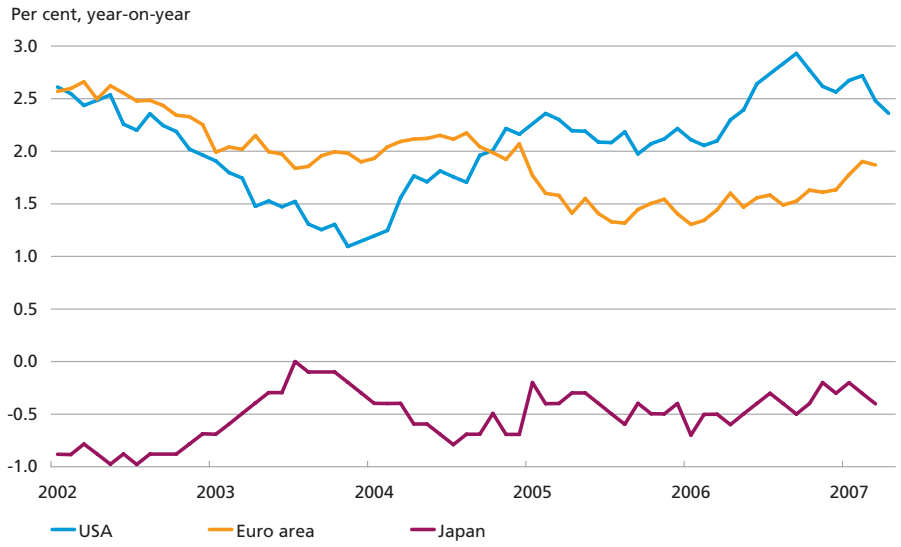
Employment continued to grow in the first months of 2007, albeit at a lower rate than in the preceding years, cf. Chart 4. The influx to the labour force has matched the increase in employment, so that unemployment has been stable at around 4.5 per cent of the labour force. The capacity pressure in the economy remains high, and wage

THE US LABOUR MARKET — Chart 4



Note: Non-farm payrolls.
Source: EcoWin.

CORE INFLATION Chart 5



Note: Core inflation is defined as the increase in consumer prices excluding energy and food.
Source: EcoWin.

increases have reached around 4 per cent on an annual basis. This is reflected in very high price pressure. In April, consumer prices rose by 2.6 per cent against the same month of 2006, and consumer prices excluding energy and food rose by 2.3 per cent, cf. Chart 5. Lower growth in the US economy is expected to gradually ease the pressure on prices.

Citing weaker growth but sustained high inflation as its grounds, at its meetings in March and May the Federal Reserve maintained the fed funds target rate at 5.25 per cent. Market participants now consider it most likely that the fed funds target rate will be lowered around the turn of the year.

Japan and China

The upswing in Japan continues, with a GDP increase by 0.6 per cent in the 1st quarter of 2007. Exports are the main driver of the upswing, but private consumption has also expanded strongly. House prices have begun to rise, while consumer prices are easing off. The Bank of Japan raised its official interest rate by 25 basis points to 0.5 per cent in February in the expectation that the upswing would stimulate inflation, and in an attempt to normalise its very expansionary monetary policy.

In China, GDP grew by more than 11 per cent in the 1st quarter of 2007 against the same quarter of 2006. Despite the substantial GDP growth, inflation has so far been low. In April, inflation was 3.0 per cent on an

annual basis. The People's Bank of China raised its interest rates in March and again in May, bringing the lending rate to 6.57 per cent and the deposit rate to 3.06 per cent. The interest rates were raised in order to reduce liquidity in the economy and dampen the growth in investments. The current-account surplus was almost 10 per cent of GDP in 2006, which has contributed to substantial inflows of foreign exchange. In order to curb the renminbi's appreciation, the People's Bank of China has continued to purchase foreign exchange on a large scale. At the end of 2006, the foreign-exchange reserve had grown to just over 1,000 billion dollars, equivalent to 42 per cent of China's and 8 per cent of the USA's GDP.

Europe

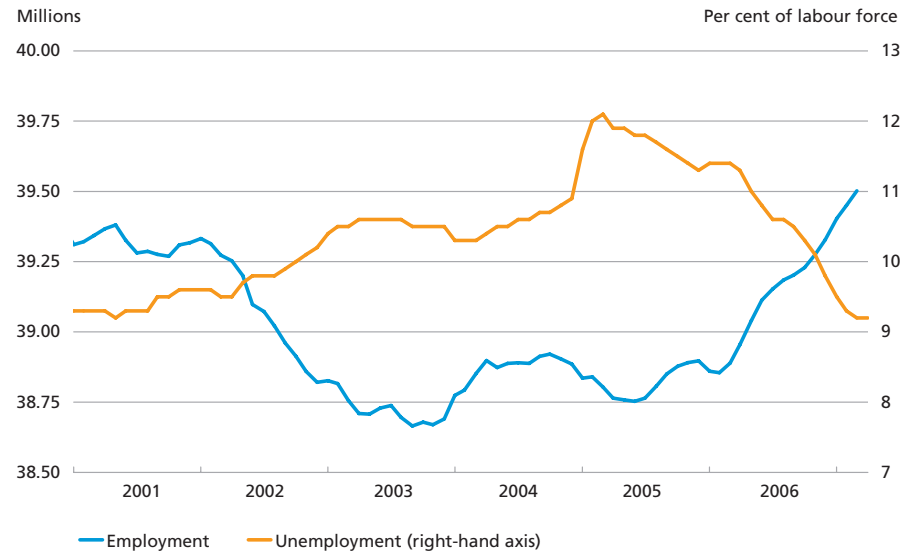
The upswing in the euro area is strong. Although growth is expected to remain high, the interest-rate increases over the last 18 months, combined with the euro's strengthening vis-à-vis the dollar and the yen, will curtail future growth. GDP in the 4th quarter of 2006 was 3.3 per cent above the same quarter of 2005, and preliminary national accounts data points to sustained growth in the 1st quarter of 2007. The upswing is broadly based and reflected in both exports and domestic demand. Fixed investments have increased in particular, and the growth in private consumption has accelerated.

The German economy looks stronger than it has done for a long time. The strong growth in employment has pushed down unemployment considerably, cf. Chart 6. Furthermore, consumer confidence has risen to the highest level in many years. The VAT increase at the turn of the year appears to have dampened retail sales in the 1st quarter, but consumption is expected to pick up as the VAT effects subside.

In March, industrial production in the euro area was 3.7 per cent higher than one year before, and business optimism is high. Especially the German business confidence index, Ifo, is at a high level.

Employment has risen in the euro area, and in February unemployment had fallen to 7.3 per cent of the labour force. Wage increases remain moderate, but the current collective bargaining in Germany points to higher wage increases in 2007-08. The benchmark collective agreement for the German metal and electronics industry entails wage increases of 4.1 per cent as of 1 June 2007 and 2.4 per cent as of 1 June 2008. Measured by the HICP, euro area inflation was 1.9 per cent in April. Inflation has been below 2 per cent since the autumn of 2006. Core inflation, measured as HICP excluding energy and food, was likewise 1.9 per cent in April. The ECB raised the minimum bid rate by 25 basis points to 3.75 per cent in March, referring among other things to the risk of higher inflation in the euro area due to stronger economic

GERMAN EMPLOYMENT AND UNEMPLOYMENT Chart 6



Source: EcoWin.

growth. The ECB still considers its monetary policy to be expansionary, and the money market expects a further 1-2 interest-rate increases, each of 25 basis points, this year.

Growth in the UK was 0.7 per cent in the 4th quarter of 2006 against the preceding quarter. This indicates that the sound economic upswing is continuing. Inflation measured by the index of consumer prices was 3.1 per cent in March, thereby deviating by more than 1 percentage point from the inflation target of 2 per cent for the first time since the Bank of England acquired operational independence in 1997. The Governor of the Bank of England therefore had to publish an open letter to the Chancellor of the Exchequer to explain why inflation had risen above the target and what the Bank proposed to do about it. Against the background of such factors as the high inflation, the Bank of England raised the bank rate by 25 basis points to 5.5 per cent in May.

Sweden and Norway are still in a strong boom with high growth, low inflation and declining unemployment. In Sweden, collective bargaining in the private sector has now entered the final phase. The benchmark agreement for industry has been adopted and entails aggregate wage increases of 10.2 per cent over three years. This is somewhat higher than under the previous collective agreement, reflecting the tight Swedish labour market.

DANISH MONETARY AND FOREIGN-EXCHANGE CONDITIONS

Since February, the Danish krone has been stable vis-à-vis the euro at a level close to its central rate in ERM II of 7.46038 kroner per euro. Danmarks Nationalbank intervened in the foreign-exchange market for a small amount on one occasion in March, and at end-April the foreign-exchange reserve was kr. 170.7 billion.

In ERM II, the central rate for the Slovakian koruna was revalued by 8.5 per cent effective 19 March following a period of frequent intervention in the foreign-exchange market by the National Bank of Slovakia. The fluctuation band remains +/- 15 per cent around the central rate. The conditions for the rest of the ERM II currencies, including the Danish krone, remain unchanged.

On 3 May 2007, the maturity of Danmarks Nationalbank's monetary-policy loans and certificates of deposit was changed from 14 to 7 days, in order to reduce the inappropriate fluctuations in the day-to-day interest rate that may occur up to an expected adjustment of interest rates.[1] The transition to 7 days' maturity was smooth.

In March, Danmarks Nationalbank followed the ECB by raising the lending rate and the rate of interest on certificates of deposit by 25 basis points to 4 per cent. The discount and current-account rates were also raised by 25 basis points, to 3.75 per cent. Viewed in isolation, the raising of interest rates over the last 18 months contributes to a dampening of growth in consumption and investments in 2007. After interest rates have been increased, the monetary-policy stimulation of the real economy is fading out, cf. Box 2.

The growth in lending to households by the banks and mortgage-credit institutes was still at a high year-on-year level of around 12 per cent in March, but has diminished since the spring of 2006, cf. Chart 8 on p. 13. The growth in lending to the corporate sector eased a little in March, but is still high at approximately 18 per cent year-on-year. As in previous upswings, the growth in corporate lending has materialised later than the growth in lending to the households.[2]

Adjusted for maturity differences, 10-year government bond yields in Denmark and Germany have been virtually identical since the turn of the year. After a few months in which portfolio flows to and from Denmark more or less balanced, there was a capital outflow in connection with portfolio investments in February, and a capital inflow in March. The capital inflow in March reflected non-residents' purchase of Danish bonds and residents' sale of foreign bonds.

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1 For further details, see Danmarks Nationalbank, *Monetary Review*, 1st Quarter 2007.
2 Cf. Lars Risbjerg, Money Growth, Inflation and the Business Cycle, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2006.

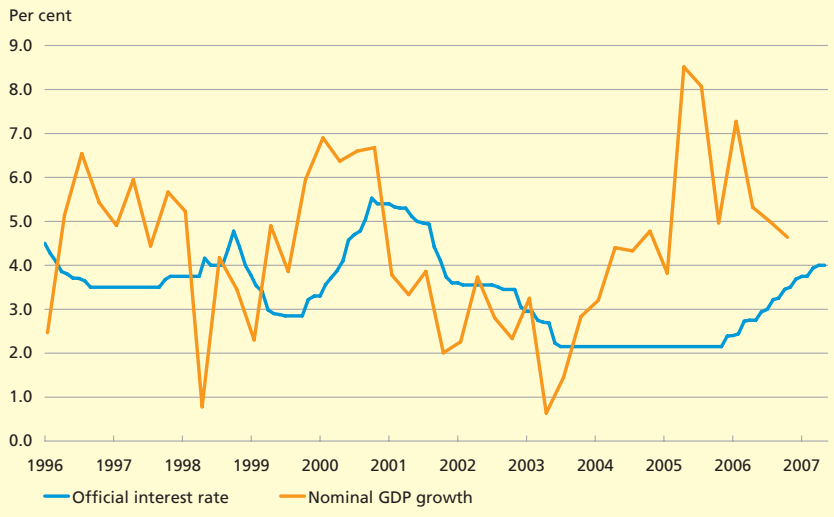
IS MONETARY POLICY STIMULATING ECONOMIC GROWTH IN 2007? Box 2

Since monetary policy in Denmark is designed to keep the krone stable vis-à-vis the euro, Danmarks Nationalbank's interest-rate decisions do not take the potential cyclical impact into account. Danmarks Nationalbank normally adjusts its interest rates when the European Central Bank, ECB, adjusts the official interest rates in the euro area. However, this does not mean that the development in Danmarks Nationalbank's interest rates is of no significance to economic activity in Denmark.

In the long term, monetary policy may not influence the real economy, but solely the price level and inflation rate. In the short term, monetary policy can stimulate or dampen the economy, and the degree of growth stimulation is often determined by the difference between the current official interest rate and the "natural short-term interest rate". The latter is the short-term interest rate that is consistent with both full utilisation of the factors of production and unchanged inflation. If the current official interest rate is lower than the natural short-term interest rate, monetary policy is expansionary.

The natural short-term interest rate cannot be observed. It must therefore be calculated, and various estimates and assumptions yield different results. The natural short-term interest rate is not constant over time, but varies in step with the economic fundamentals. The natural short-term interest rate comprises two elements: inflation and real interest rates. In view of Denmark's fixed-exchange-rate policy, the inflation element can be equated with the ECB's target of keeping inflation below, but close to, 2 per cent p.a. The real-interest-rate element can be approximated by the potential real growth rate of the economy, currently towards 2 per cent p.a.[1] The sum of the inflation and real-interest-rate elements corresponds to the economy's nominal potential growth rate. Consequently, the natural short-term interest rate can currently be estimated at around 4 per cent p.a. In March 2007, Danmarks Nationalbank raised its lending rate and rate of interest on certificates of deposit to 4 per cent p.a., i.e. close to the level of the natural short-term interest rate. Monetary policy is thus close to being neutral, and the actual stimulation of the real economy via monetary policy is fading out.

NOMINAL GROWTH AND INTEREST RATES IN DENMARK, 1996-2007 Chart 7



Note: The official interest rate is the monthly average rate of interest on certificates of deposit. Growth in GDP is on a quarterly basis.
Source: Danmarks Nationalbank.

CONTINUED Box 2

Since the end of 2005, when the latest series of monetary-policy tightenings in the euro area began, the short-term interest rate in Denmark has risen by almost 2 percentage points, cf. Chart 7, while the long-term interest rate has risen by around 0.75 percentage points. Multiplier calculations on Danmarks Nationalbank macro-economic model, Mona, indicate that on an isolated increase in the level of interest rates by 1 percentage point for all maturities the real GDP level will be around 0.5 per cent lower than in the baseline scenario after two years, and around 1 per cent lower after 4-6 years.[2] Viewed in this context, the interest-rate increases over the past 18 months are thus in isolated terms assessed to have reduced real GDP growth by around 0.25 per cent in 2007.

In Mona, the real economic impact of an increase in interest rates is via consumption and investments.[3] When interest rates rise, it becomes more expensive to finance consumption, leading to a current tendency to save up rather than consume. In addition, the cash price of real property is reduced, which pushes down housing investments and curtails the households' wealth and consumption. The higher interest rates also reduce corporate investments since loans become more expensive and passive investments yield higher returns. In Mona, housing investments initially react most strongly to the increase in interest rates, but they account for a relatively small share, and the reaction in private consumption and corporate investments is more significant. After some years, the decline in activity increases unemployment and reduces employment.

[1] According to economic growth theory, the real interest rate corresponds to real GDP growth plus a time preference premium. In the period 1875-2003, the average short-term real interest rate (compiled as the difference between a short-term money-market rate and consumer price inflation) was 2.9 per cent p.a., while real GDP growth was 2.8 per cent p.a., cf. Kim Abildgren, *Interest-Rate Development in Denmark 1875-2003 – A Survey*, Nationaløkonomisk Tidsskrift, Vol. 143, No. 2, 2005, pp. 153-167. Based on these figures, the time preference premium appears to be relatively modest (0.1 per cent p.a.).

[2] Cf. Danmarks Nationalbank, *Monetary Policy in Denmark*, 2nd edition 2003.

[3] Cf. Danmarks Nationalbank, *MONA – a quarterly model of the Danish economy*, 2003.

Covered bonds (SDO)

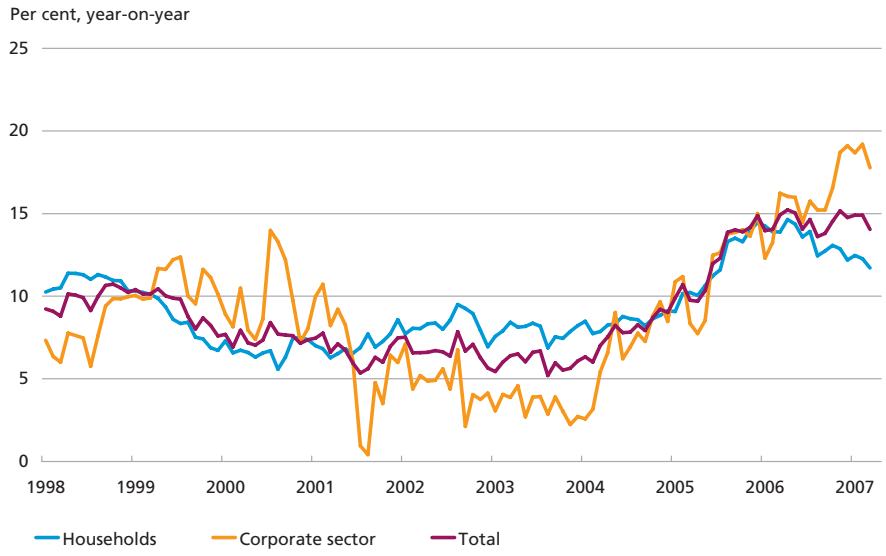
On 28 March 2007, the Minister for Economic and Business Affairs tabled a bill on covered bonds. This legislative amendment is intended to give the banks access to issue covered bonds, and to allow mortgage-credit institutes and Danish Ship Finance to continue to issue covered bonds. The bill is a result of the EU's new capital-adequacy rules, which impose more rigorous requirements for bonds to be classified as covered bonds. The act is expected to enter into force on 1 July 2007[1]. The rules have been designed to ensure that the new home-financing system is as secure as the existing mortgage-credit system.

In connection with the new regulation of covered bonds, a new balance principle will be established. Like the existing balance principle, the basic rule is that no interest-rate, option or exchange-rate risks may

[1] See the section on covered bonds in Recent Economic and Monetary Trends, Danmarks Nationalbank, *Monetary Review,* 1st Quarter 2007.

TOTAL GROWTH IN LENDING BY BANKS AND MORTGAGE-CREDIT INSTITUTES

Chart 8



Note: Including lending by foreign units of Danish banks. Adjustment is made for the fact that since January 2003 FIH has been included in the balance-sheet statistics for banks. The corporate sector includes financial corporations (except MFIs). The total includes the public sector and lending not broken down by sector.
Source: Danmarks Nationalbank.

be incurred. Today, risk is hedged primarily by selling bonds that are exactly identical to the housing loans. Internationally, this is known as "back to back". This will still be possible under the new balance principle, so that the mortgage-credit institutes can continue to grant loans and issue bonds in precisely the same way as before.

In addition, the new balance principle will make it possible to use financial instruments to hedge risk to a greater extent than is the case today. On the other hand, the hedging of risk will be subject to slightly more severe stress testing, in order to ensure an adequate hedging basis.

The regulation of covered bonds also entails a tightening of the current mortgage-credit legislation in order to comply with new EU directives. With covered bonds, an LTV (loan-to-value) limit of 80 per cent must be observed throughout the term of each housing loan that serves as collateral for the issue of bonds, i.e. the value of the loan must never exceed 80 per cent of the value of the mortgaged home. Under the present mortgage-credit legislation this only applies at the time that the loan is raised. If house prices fall, the banks and mortgage-credit institutes must therefore, if necessary, immediately supplement the collateral for the covered bonds that have been issued. They can do this by e.g. raising loans and investing in government bonds that are pledged as top-up collateral. The new covered bonds will therefore

always be well collateralised, and their prices will not be influenced much by falling house prices or deterioration in the issuer's credit standing. If the expiry and refinancing of covered bonds coincide with problems for the issuer, this can primarily be expected to be reflected in a higher interest rate for any loan raised to finance the purchase of top-up collateral.

Covered bonds are extremely secure and can thus be sold at a good price, like today's mortgage-credit bonds. The ongoing observance of the LTV limit will make them extra secure.

The option for banks to finance lending by issuing covered bonds against real property as collateral will intensify the competition between banks and mortgage-credit institutes.

The improved opportunity to use financial instruments to hedge risk will enable the further decoupling of housing loans from the bonds issued. This may pave the way for new housing loan products from banks and mortgage-credit institutes. The new rules comprise a number of initiatives that increase the credit institutions' responsibility to give sound advice and make it easier for consumers to compare the costs of different housing loans.

THE DANISH ECONOMY

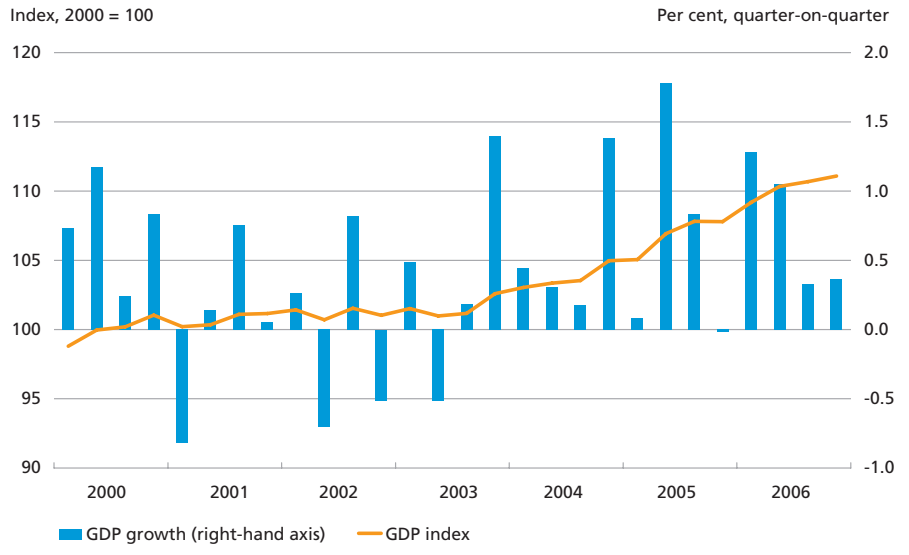
Economic activity, foreign trade and balance of payments

The revised national accounts data for Denmark shows an increase in real GDP by 3.2 per cent in 2006. In the 4th quarter, GDP grew by 0.4 per cent over the preceding quarter, cf. Chart 9. Private consumption rose by 0.7 per cent in the 4th quarter, after a strong drop of 1.5 per cent in the preceding quarter. Retail sales were particularly strong in the 4th quarter. Growth was generally curbed by a strong increase in imports, cf. below.

The slowdown in private consumption appears to have continued into 2007. Seasonally adjusted purchases of new passenger cars have been more or less unchanged for the past year, and in the 1st quarter were 1.1 per cent higher year-on-year. This stagnation should be viewed against the very high level of car sales already reached during the upswing. The retail sales index fell by 0.8 per cent in the 1st quarter, after seasonal adjustment, but this is solely attributable to the record-high Christmas trade. Compared with the 1st quarter of 2006, retail sales increased by 1.4 per cent.

The growth in consumption is dampened by such factors as the raising of interest rates over the last 18 months, cf. above, which, combined with the slowdown in the housing market, has curtailed household borrowing. According to the Association of Danish Mortgage Banks, in

GDP IN DENMARK Chart 9



Source: Statistics Denmark.

the 1st quarter of 2007 the price per square metre of single-family and terraced houses rose by an average of 1.2 per cent from the preceding quarter, while prices of owner-occupied flats fell by 1.8 per cent. Overall, increases in housing prices have been relatively modest, but there are considerable regional variations. The largest price drop is registered for owner-occupied flats in Greater Copenhagen, where the price per square metre nevertheless remains very high compared with elsewhere in Denmark. The sluggish housing market is also reflected in the sales volume, which declined in the 1st quarter, particularly for owner-occupied flats. In addition, the number of homes put up for sale has increased further in recent months. Statistics Denmark's housing price data shows slightly weaker development in the 4th quarter of 2006 than the statistics from the Association of Danish Mortgage Banks.

Despite the housing market's dampening, the high employment rate and the strong income growth entail that consumption is not likely to diminish significantly in the short term. The increase in housing wealth in recent years has only been reflected in consumption to a limited extent, so the slowdown in the housing market is expected to have little impact on the propensity to consume. Consumer confidence was high in April.

Government consumption in constant prices rose by 1.2 per cent in 2006, primarily due to increasing purchases of goods and services from private suppliers. This indicates that fiscal policy in 2006 was ultimately not as tight as originally intended.

The economic upswing has had a considerable impact on corporate investments. Investments in machinery and transport equipment, etc. rose by 2.8 per cent in the 4th quarter, and by 16.6 per cent for the full year. Furthermore, non-residential construction grew significantly. The strong expansion of the capital stock to a high degree reflects how business enterprises are seeking to compensate for the shortage of labour and ease the pressure on capacity. Sound corporate earnings also facilitate capacity expansion.

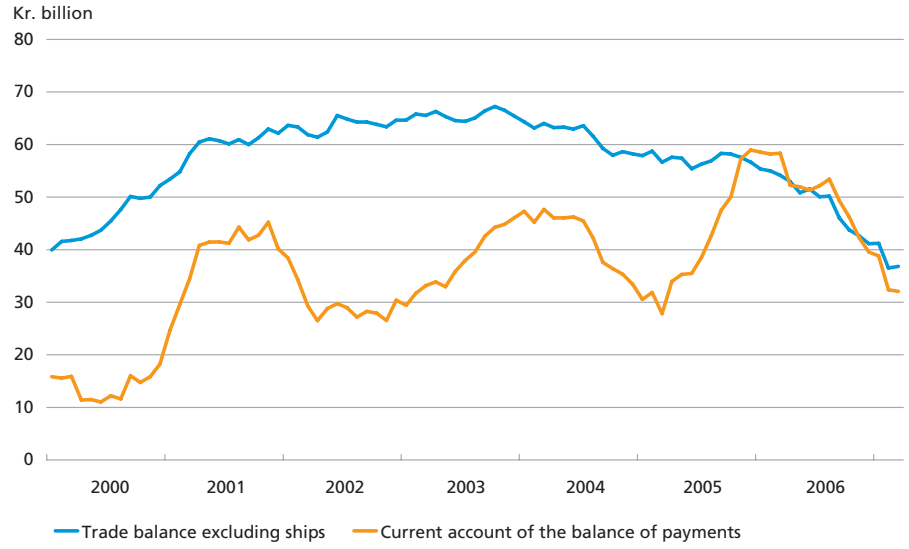
Construction activity is booming, and the shortage of both labour and materials has been pronounced in this sector. The respective indicators of shortages of labour and materials in the building sector are lower than at the end of 2006, but both indicators are still higher than before. In the 1st quarter, seasonally adjusted employment within building and construction rose by a full 17 per cent against the preceding quarter, which indicates very strong growth in activity.

The volume index for industrial production has shown a clear upward trend in recent years; especially the manufacture of investment goods and intermediate products has increased. These goods contain a large import element. In the 1st quarter, industrial production was no less than 3.1 per cent higher than one quarter before. Industry's output expectations for the next three months fell from March to April, while the expectations of future export orders remain high. At the end of March, enterprises representing 14 per cent of employment in industry stated that the shortage of labour curtailed production. This is the highest ratio registered since the statistics began in 1980.

The strong growth in imports from 2006 has continued in recent months. The trade surplus was kr. 7.3 billion in the 1st quarter, or kr. 4.3 billion lower than one year before. The deterioration inter alia reflects a reduced surplus from energy trade due to falling production in the Danish oil and gas fields in recent months. There has also been a large deficit on trade in manufactured goods. The 1st quarter saw a current-account deficit of kr. 3.1 billion. Viewed over the past 12 months, the current account has shown a surplus of kr. 32 billion, cf. Chart 10. This is kr. 21 billion less than in the 12 months up to August 2006. The decline is related primarily to the balance of goods, which also includes the rising costs of bunkering.

In view of the shortage of especially labour, the strong growth in demand in 2006 was targeted mainly at imports, which rose by 14.0 per cent in constant prices, while exports rose by 9.6 per cent. Since the upswing set in, imports in constant prices have grown considerably more than exports. In the 4th quarter, imports in 2000 prices exceeded exports for the first time in some years, cf. Chart 11. However, the balance of

TRADE BALANCE AND BALANCE OF PAYMENTS, SUM OF 12 MONTHS — Chart 10



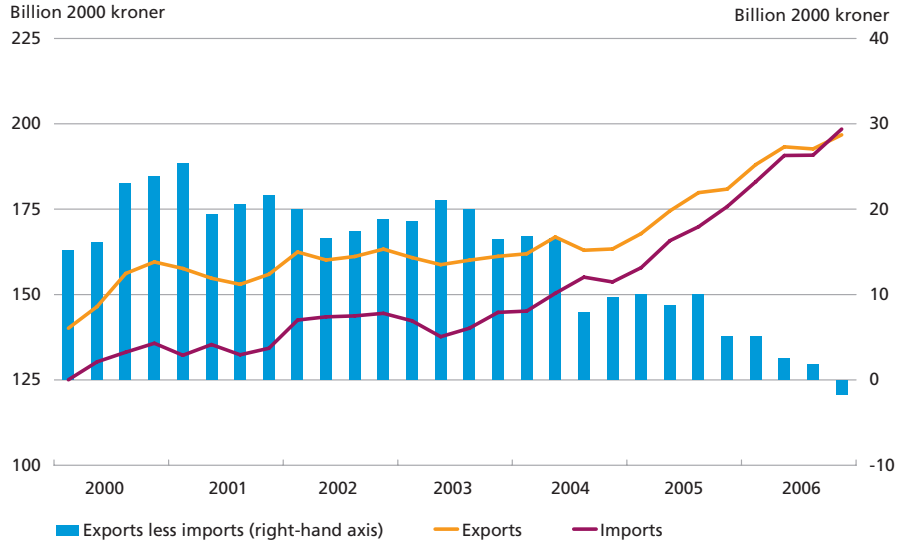
Source: Statistics Denmark.

goods and services still shows a sound surplus in current prices, due to the favourable terms of trade.

Labour market, wages and prices

The labour market has tightened further. The growth in output in recent years has significantly boosted employment. Seasonally adjusted employ-

EXPORTS AND IMPORTS IN DENMARK — Chart 11

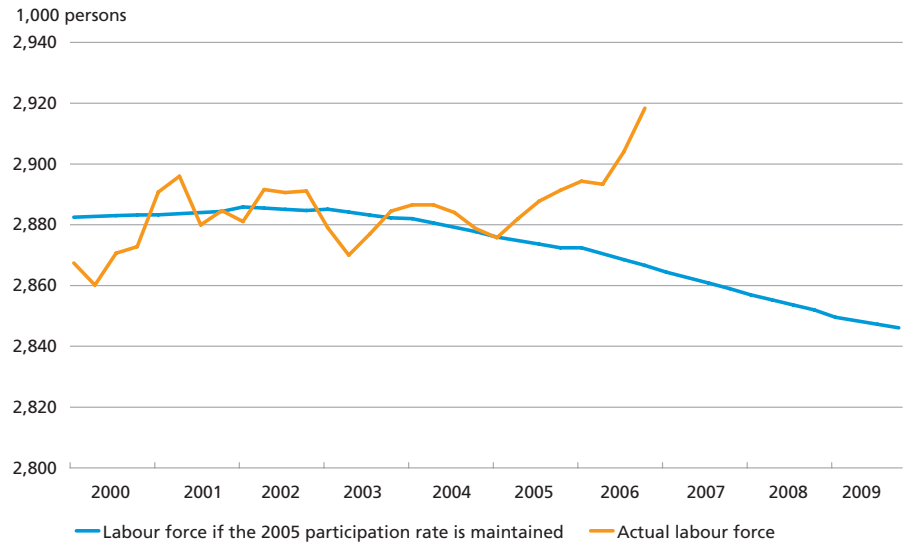


Source: Statistics Denmark.

ment rose rapidly in the 4th quarter of 2006, by 0.9 per cent or 24,800 people. In the same period, the number of hours worked increased by 2.4 per cent, so that the growth by 0.4 per cent in the national accounts entails an unexpected decline in productivity. The quarterly growth rates in the national accounts are characterised by high volatility, and productivity has increased over the full year, but at a lower rate than earlier in the upswing. Employment rose by 52,200 in 2006 overall. An increase at this level has not been seen since the boom in the mid-1980s. The rise in employment in 2006 was driven by the private sector, particularly the service sector and building and construction. For the first time in many years, employment in manufacturing rose.

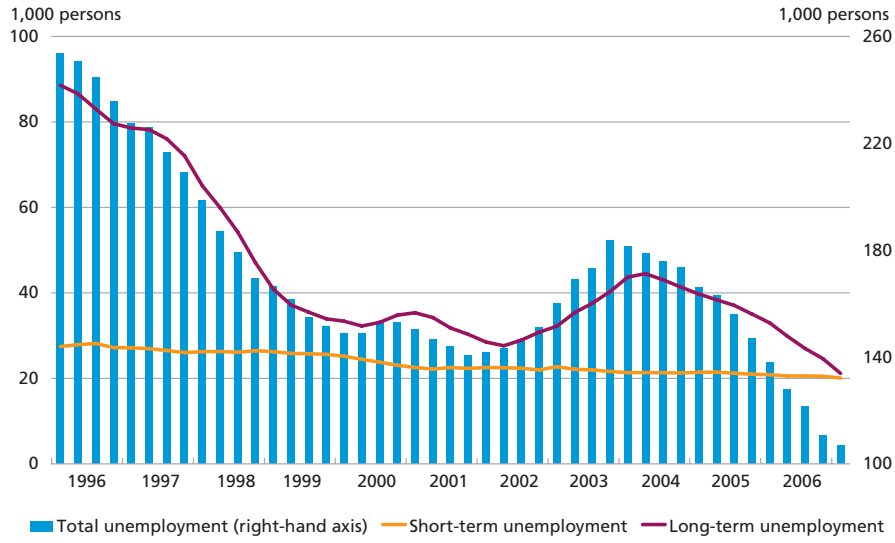
The labour force, calculated as the sum of those in employment and the unemployed, grew by approximately 19,000 in 2006, cf. Chart 12. The demographic development pointed to a reduction of the labour force by almost 5,000 from 2005 to 2006, but this was more than offset by an influx from abroad and a higher participation rate. The number of active work permits issued to people from the new EU member states in eastern Europe exceeded 10,000 in March. On an annual basis, the level was a good 6,000 higher. In addition, the number of commuters from especially Sweden and Germany has risen. The increasingly negative contribution from demographic trends in the coming years will make it still more difficult to augment the labour force further.

ACTUAL AND DEMOGRAPHICALLY DETERMINED LABOUR FORCE Chart 12



Note: Demographically determined labour force if the 2005 participation rate is maintained. The level has been elevated so that for the 1st quarter of 2005 it is equivalent to the labour force calculated as the sum of the national accounts data for employment and registered unemployment.
Source: Statistics Denmark and own calculations.

SHORT-TERM AND LONG-TERM UNEMPLOYMENT Chart 13



Note: Number of persons with an unemployment ratio within the last year of less than 0.2 (short-term) and more than 0.8 (long-term) multiplied by the average unemployment rate.
Source: Statistics Denmark and own calculations.

In March, seasonally adjusted unemployment was 106,600, equivalent to 3.9 per cent of the labour force, or 3.4 per cent if the EU-harmonised definition is applied. With the Netherlands, Denmark was the EU member state with the lowest rate of unemployment in March, when unemployment was 1,500 lower than in December. Furthermore, the seasonally adjusted number of people in activation schemes fell by around 5,000 from December to March.

Unemployment has fallen by just over 80,000 since December 2003. The decline has been registered across virtually all regions and sectors and has to a great extent involved people who had been unemployed for a prolonged period, cf. Chart 13. Short-term unemployment, which includes seasonal unemployment, graduates who have not yet found work, and transitional unemployment, is not particularly cyclical and has by and large remained unchanged during the upswing.

The tight labour market and the rapid erosion of the current-account surplus both point in the same direction: for all practical purposes the economy has reached its capacity limit, and the pressure is set to continue, even though consumption growth is diminishing.

The economic policy for 2008 will be laid down in the coming months. The high degree of capacity utilisation in the Danish economy, and the favourable international economic outlook, call for a tight fiscal policy. A more detailed assessment should be made in connection with the 2008 Finance Act negotiations.

Despite the tight labour market, the statistics still show moderate wage increases. At present no wage statistics extending into 2007 are available, but in the 4th quarter of 2006 the rate of wage increase in the private sector was 3.1 per cent.

New 3-year collective agreements have been concluded by most of the private labour market, cf. Box 3. It cannot be said with certainty how wage costs will develop, since for most of the collective agreements this

COLLECTIVE BARGAINING 2007 Box 3

Around 600,000 employees are covered by new collective agreements after the spring bargaining between the Confederation of Danish Employers and the Danish Confederation of Trade Unions. Wages, pensions, further training and working conditions are among the areas negotiated. Once again, 3-year agreements have been concluded.

The first agreement was concluded for the industrial sector. It entails that the current minimum wage of kr. 95.15 per hour is raised by kr. 3 in 2007, kr. 2.50 in 2008, and kr. 2.50 in 2009. The 2004 agreement operated with increases of kr. 2.25 in each of the three years. The actual hourly wage is negotiated locally, and the vast majority of industrial workers receive more than the minimum wage. The pension contribution is raised from the present 10.8 per cent to 11.1 per cent in 2008 and 12 per cent in 2009. In future, wages will be paid for nine weeks of parental leave. Flexibility is achieved by giving permanent status to the pilot scheme which allows local agreements to deviate from the collective rules on e.g. working hours.

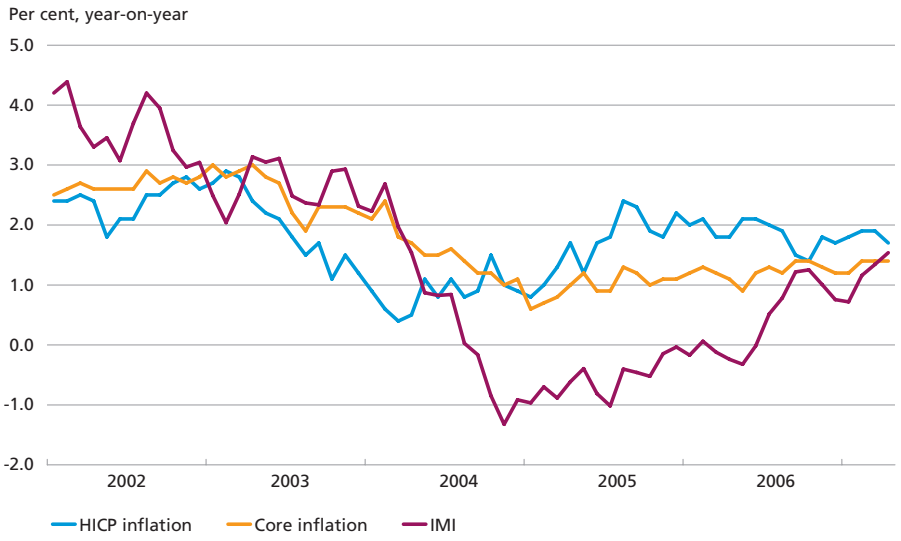
New elements of the agreements for industry include a "free choice" wage account into which the employer pays 0.5 per cent of wages in 2007, 0.75 per cent in 2008 and 1 per cent in 2009. Compensation for unused holiday entitlement is also paid into this account. The employee can then decide whether the money is to be paid out or added to pension savings. Another innovation is the establishment of a competence development fund financed via an annual contribution per employee, to be paid by the employer. Employees with at least nine months' seniority will be entitled to two weeks off per year for continuing training/skills updates and may apply to the fund for support for course fees and part of the lost earnings.

The agreements for industry set the bar for a number of other minimum-wage and minimum-pay agreements within e.g. building and trade and service.

In late March, the transport sector was the first normal-wage area to conclude a collective agreement. The present hourly wage of kr. 96.35 is raised by kr. 3.50 in 2007, kr. 3 in 2008 and kr. 3 in 2009. The equivalent figures under the 2004 agreement were, respectively, kr. 2.65, kr. 2.75 and kr. 2.65. Under the new agreement, various supplements are also raised, including most sector supplements by kr. 1.65 per hour for each of the three years. In the normal-wage area, employees in principle receive the collectively negotiated hourly wage, and – unlike e.g. industry – only a small percentage is negotiated locally. The pension contribution is generally raised by 1.2 per cent to 12 per cent, and the period of paid parental leave is extended to nine weeks. The benchmark transport agreement also includes a savings account similar to industry's "free choice" account, as well as the establishment of a competence development fund. Flexibility is increased by expanding the normal working hours for which no supplements are payable by one hour.

The benchmark transport agreement formed the basis for e.g. the normal-wage agreements for the food industry and the cleaning sector.

HARMONISED CONSUMER PRICE INFLATION AND IMI Chart 14



Note: The most recent observations are from April. "Core inflation" is defined as the increase in HICP excluding energy and food and including alcohol and tobacco.
Source: Eurostat and Danmarks Nationalbank.

will depend mainly on the local wage negotiations at the individual workplaces. Assessed on the basis of the collective agreements that do include wage terms, called the normal-wage area, the overall average rate of wage increase will be higher than under the previous collective agreements, and also higher than in Sweden and Germany. Higher wage increases mean that productivity must be raised if Denmark's sound competitiveness is to be maintained and inflation kept at bay. Otherwise, wage levels will have a negative impact on employment in the coming years.

The overall rate of increase in Danish consumer prices is still moderate, cf. Chart 14. Measured by the HICP, consumer prices in April were 1.7 per cent higher than in April 2006. This is 0.2 percentage points lower than in March, reflecting a pronounced drop in electricity prices. Food and beverages account for the largest price increases over the last 12 months. Domestic market-determined inflation, IMI, has been rising since the end of 2004, but remains below HICP inflation. The IMI index is more sensitive to cyclical fluctuations in Denmark than the overall consumer price index, and the mounting domestic inflationary pressure indicated by the IMI index reflects such factors as the tight labour market[1].

[1] For a more detailed description of the cyclicality of the consumer price and IMI indices, see Bo William Hansen and Dan Knudsen, The Cyclicality of Domestic Prices, Danmarks Nationalbank, *Monetary Review,* 4th Quarter 2006.

The Pass-Through from Danmarks Nationalbank's Interest Rates to the Banks' Retail Interest Rates

Maria Carlsen, Economics and Charlotte Franck Fæste, Statistics

INTRODUCTION AND SUMMARY

When Danmarks Nationalbank adjusts its monetary-policy interest rates, the retail banks normally change their interest rates on loans to corporations and households. In this article, the extent of this pass-through, and whether it has changed during the period 1983-2006, is estimated.

The interest-rate pass-through is generally high and has increased over time. A high pass-through from the monetary-policy interest rates to the banks' interest rates reflects an effective transmission of Danmarks Nationalbank's interest-rate policy.

The extent and speed of the pass-through of a change in the monetary-policy interest rates to the banks' interest rates is dependent on several factors. For example, the greater use of products with variable interest rates will speed up the pass-through, just as the degree of competition also influences both the interest-rate pass-through and the interest-rate margin.

The banks normally change their interest rates during the same month as the monetary-policy interest rates are adjusted, alternatively in the following month. The large banks are the first to change their interest rates for the households after monetary-policy interest rates are adjusted, while the smaller banks typically follow suit during the next month.

The article first considers the development in interest rates and the interest-rate margin over time. Then the pass-through from the monetary-policy interest rates to the banks' interest rates is estimated using a linear regression model. The model is estimated for different subperiods, sectors and purposes. Finally, the data is analysed for groups of banks broken down by size. In conclusion, the results are compared with results from other countries.

TRANSMISSION FROM MONETARY-POLICY INTEREST RATES TO THE BANKS' INTEREST RATES

As a consequence of the fixed-exchange-rate policy, Danmarks Nationalbank's interest rates normally follow the interest rates of the European Central Bank, ECB, for the euro area.[1] Danmarks Nationalbank's interest rates determine the short-term interest rates in the Danish money market and thus influence the price of liquidity for the banks. Changes in the monetary-policy interest rates will therefore normally entail that the banks adjust their interest rates for most customers.

Some banks change their interest rates whenever the monetary-policy interest rates are adjusted. However, many banks accumulate Danmarks Nationalbank's interest-rate adjustments, changing the interest rates for many of their products for every second interest-rate adjustment by Danmarks Nationalbank. The interest rates for certain products, such as mortgage loans, are tied directly to Danmarks Nationalbank's interest rate[2], and will therefore fluctuate in step with changes therein. In addition, certain bank products, typically business loans, are linked to money-market interest rates. Expectations of coming adjustments to the monetary-policy interest rates are normally reflected in the money-market interest rates prior to an actual adjustment, so that some banks' interest rates may change before Danmarks Nationalbank actually adjusts its interest rates. This article examines the direct pass-through from Danmarks Nationalbank's interest rates to the banks' interest rates.

Overall, the banks' average interest rates have followed Danmarks Nationalbank's interest rates relatively closely since 1983, cf. Chart 1.[3] Especially in the second half of the period there has been close correlation between changes in the monetary-policy interest rates and in the banks' interest rates. The discount rate remained unchanged for a long period from October 1983 to March 1990, but from the start of the 1990s regained the function of signal interest rate for the general level of monetary-policy interest rates in Denmark.

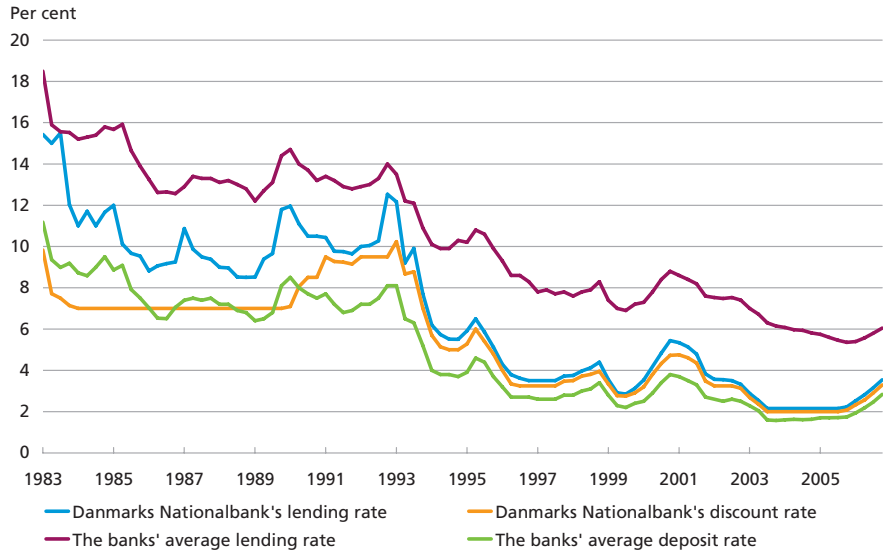
An initial impression of the development in the banks' interest-rate margin can be gained from considering the difference between the banks' average lending and deposit rates, cf. Chart 2. The interest-rate

[1] Denmark has conducted a fixed-exchange-rate policy since the start of the 1980s. See Danmarks Nationalbank (2003) and Danmarks Nationalbank (2006) for further details of monetary policy in Denmark.

[2] The interest rate on mortgage loans is pegged to the rate of interest on Danmarks Nationalbank's certificates of deposit (which is equivalent to Danmarks Nationalbank's lending rate).

[3] The literature has often discussed whether the banks change their lending rates more when the monetary-policy interest rates are raised than when they are lowered. This potential asymmetry is not studied directly in this article, but the fact that both the banks' lending and deposit rates have followed Danmarks Nationalbank's interest rates over time limits any possible asymmetry.

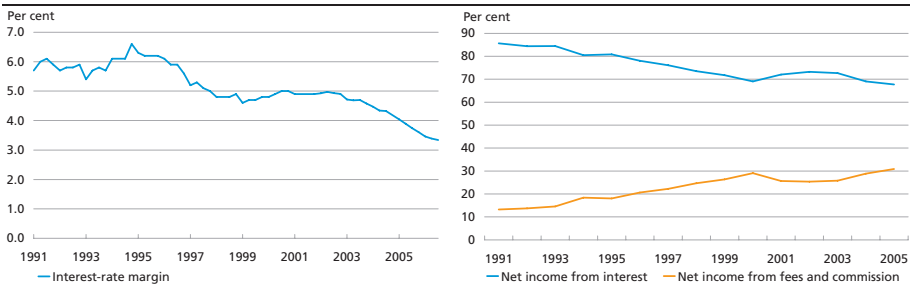
DEVELOPMENT IN INTEREST RATES SINCE 1983 Chart 1



Note: The banks' average lending rate is adjusted for earlier data breaks. The banks' interest rates are weighted averages of the interest rates for outstanding amounts with general government, non-financial corporations and households, i.e. excluding the MFI sector and other financial corporations. Danmarks Nationalbank's lending rate in the period 1983-92 is the marginal lending rate, cf. Mikkelsen (1993).
Source: Danmarks Nationalbank.

margin has narrowed since the early 1990s, for which there can be several reasons. When interest rates are falling, and the level of interest rates is generally low, a certain downward rigidity can be seen. This is especially the case for deposit interest rates, since these cannot be negative. In

INTEREST-RATE MARGIN (LEFT-HAND CHART) AND INCOME FROM INTEREST AND FEES (RIGHT-HAND CHART) Chart 2



Note: Left-hand chart: here the interest-rate margin is calculated as the difference between the banks' average lending and deposit rates based on quarterly data. The banks' average lending rate is adjusted for earlier data breaks. The banks' interest rates are weighted averages of the interest rates for general government, non-financial corporations and households, i.e. excluding the MFI sector and other financial corporations.
Right-hand chart: net income from interest, net income from fees and commission as percentages of total net income from interest and fees. Due to changes in accounting rules the figures for net income from fees and commission from 2005 are not directly comparable with previous years.
Source: Danmarks Nationalbank and the Danish Bankers Association.

AVERAGE INTEREST RATES IN DANMARKS NATIONALBANK'S INTEREST-RATE STATISTICS Box 1

Danmarks Nationalbank's interest-rate statistics comprise the banks' interest rates compiled according to the average-interest-rate principle, and state the actual annual interest on lending and deposits in a given period.[1] In 2003, Danmarks Nationalbank introduced improved interest-rate statistics with detailed breakdowns by sector and purpose categories. A distinction is made between average interest rates for outstanding amounts and new business. The average interest rates on outstanding amounts are calculated on the basis of the reported interest income and expenses, and average balances for respectively lending and deposits.[2] For new business, the effective interest rates are reported directly for each bank, after which the average for the sector is weighted in relation to the business volume of the individual banks. On compiling the interest rates, an important factor is that outstanding loans are compiled on the basis of original maturity, while new business is compiled by fixed-interest period, i.e. the period for which the interest rate is fixed. This entails that interest rates for outstanding amounts and new business are not directly comparable.

The banks' average interest rates are determined by the customers' creditworthiness, the size of the loans, and other customer-related factors. The interest rates of individual banks are affected especially by the range and structure of the banks' products. In addition, especially interest rates on new lending are exposed to the individual banks' customer and product structures in a given month. The average interest rates in the individual categories thus reflect a wide range of activities and can vary considerably between categories, cf. the Table.

addition, the emergence in recent years of mortgage loans against real estate as collateral has contributed to both lower lending rates and higher deposit rates.[1] The keener competition for bank customers may be another factor behind the narrowing of the interest-rate margin.

The development in the interest-rate margin must be interpreted with caution, however, since average interest rates reflect many different interest rates and do not include fees, cf. Box 1. As a consequence, competition between the banks cannot be evaluated solely on the basis of the development in the interest-rate margin. Today, the banks have spread their activities across more areas, so that the development in the interest-rate margin plays a smaller role for the banks' earnings now than was previously the case. In step with the diminishing interest-rate margin, the banks' net income from fees as a percentage of total net income from interest and fees has risen, while net income from interest

[1] Since 2003 several banks have introduced mortgage loans. The mortgage loans vary among the banks, but generally adhere to the same basic concept whereby the loan is either an overdraft facility or an ordinary housing loan at an adjustable interest rate, with a long maturity, granted against real estate as collateral. When the banks issue a loan against real estate as collateral, a deposit account for the nominal value of the loan is often established at the same time. As the proceeds from the loan are disbursed, the deposit is reduced accordingly. The interest terms of the loan and deposit accounts are typically identical.

CONTINUED Box 1

There can also be considerable variation between the sub-components of a category. For example, the average interest rate for demand deposits was 2.5 per cent in December 2006, which is significantly above the interest on e.g. a salary account.[3] But since only a small proportion of the total demand deposits relate to salary accounts at low interest rates, the average deposit rate is rather higher.

THE BANKS' INTEREST RATES VARY BY SECTOR AND PURPOSE Table

	December 2006	
	Outstanding amounts	New business
Total lending	5.4	…
Households	6.9	6.7
- Housing purposes	6.1	6.3
- Consumer credit and other purposes	7.7	7.2
- Overdraft facilities	7.2	…
Non-financial corporations	5.2	4.9
Total deposits	3.0	…
Households	2.5	…
- Demand deposits	2.5	…
- Time deposits	2.7	3.0
Non-financial corporations	3.0	…
- Demand deposits	2.8	…
- Time deposits	3.6	3.4

Source: Danmarks Nationalbank.

[1] For a detailed description of Danmarks Nationalbank's interest-rate statistics see Christoffersen and Jacobsen (2003) and Persson (2005).

[2] Accruals are made for the reported interest income and expenses, i.e. both booked and due interest are included.

[3] Demand deposits comprise a diverse product mix of loans without fixed maturity or notice, such as salary accounts.

has declined, cf. Chart 2.[1] Another drawback of using the interest-rate margin to illustrate the competition in the banking sector is that the banks are also exposed to competition from the capital-market based mortgage-credit system. For example, when mortgage-credit legislation was liberalised in the early 1990s, the opportunities for mortgage equity withdrawal were expanded.

DEGREE OF PASS-THROUGH TO THE BANKS' INTEREST RATES

Below, a more detailed analysis of the pass-through from the monetary-policy interest rates to the banks' interest rates is made on the basis of a

[1] It should be noted that income from fees reflects considerable variation in types of fees, from debit and credit card transactions to securities brokerage commission. As from 2005 the new accounting rules divide e.g. fees into categories. In 2005, securities brokerage commission and custodian account fees comprised approximately 39 per cent of the total income from fees and commission.

METHOD Box 2

The article applies the following linear regression model:

$$(1)\ \Delta PI_t = \alpha + \beta\,\Delta PP_t + \beta_1\,\Delta PP_{t-1} + \beta_2\Delta PP_{t-2} + \ldots\ldots + \beta_k\Delta PP_{t-k} + \varepsilon_t, \quad t = 1,\ldots, T$$

PI is either the banks' average deposit or lending rate, and PP is Danmarks Nationalbank's interest rate. Δ denotes the change from period t-1 to period t, i.e. for example $\Delta PP_t = PP_t - PP_{t-1}$. Furthermore, α denotes a constant that is expected to be around zero if the banks' interest rates over time follow Danmarks Nationalbank's interest rates. β denotes by how much the banks on average change their interest rate in period t when Danmarks Nationalbank raises the interest rate by 1 per cent in period t. The pass-through from the monetary-policy interest rates to the banks' interest rates is thus given by the β coefficients. Considering, for example, monthly data, β denotes the pass-through in the same month as the monetary-policy interest rates are adjusted, β_1 denotes the pass-through in the following month, β_2 denotes the pass-through two months after, and so on. The sum of the β coefficients therefore expresses the total pass-through. Finally, ε_t is a residual.

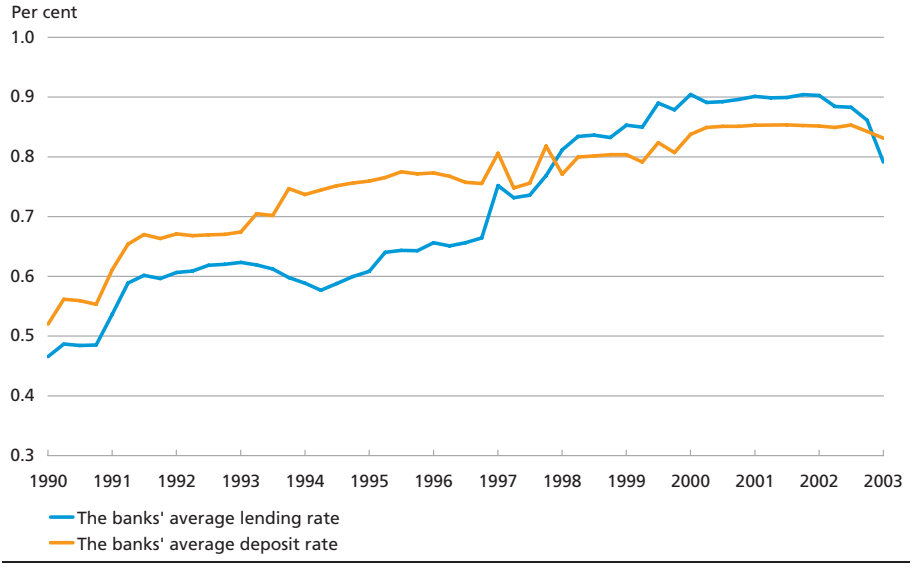
Depending on data availability the model is estimated on a quarterly basis for some periods, while in other periods it is estimated on a monthly basis, cf. the remarks to the individual tables.

linear regression model, cf. Box 2. For the banks, the starting point is the quarterly series of the banks' average lending and deposit rates on outstanding amounts, as shown in Chart 1. As an expression of Danmarks Nationalbank's interest rate, the lending rate is used up to the 2nd quarter of 1992, and subsequently the discount rate.

The pass-through from the monetary-policy interest rate to both the banks' average deposit and lending rates has increased over time, cf. Chart 3. The stronger pass-through in the last part of the period may be due to several factors, where especially the products offered by the banks play a role in determining the size and speed of pass-through. The greater the volume of short-term outstanding amounts and adjustable-rate loans, the faster the pass-through. The increased interest-rate pass-through may thus reflect the greater prevalence of adjustable-rate loans. Adjustable-rate deposits and lending are estimated at 60 per cent of respectively total deposits and lending at the beginning of the 1990s, and between 60 and 70 per cent in the mid-1990s, while in the period 2003-06 the average share is between 80 and 90 per cent.[1]

[1] The estimate for the 1990s is based on outstanding amounts where it is assumed that adjustable-rate loans have an original term to maturity of up to one year. As there can be adjustable-rate loans in all maturity segments under outstanding amounts, the share is probably slightly underestimated. The data for the 1990s is from the Danish Financial Supervisory Authority. After 2003, new business can be compiled on the basis of fixed-interest periods that better reflect the volume of adjustable-rate loans. The estimate for the period 2003-06 is therefore based on data for new business with a fixed-interest period of up to one year.

DEVELOPMENT IN THE PASS-THROUGH OVER TIME (BETA COEFFICIENT) Chart 3



Note: Estimated on the basis of quarterly data. The estimate for the beta coefficient is achieved from a moving regression over time that is centred with 15 observations on each side. The monetary-policy interest rate is the right-hand variable in the regressions behind both curves.
Source: Danmarks Nationalbank and own calculations.

In the periods after respectively 1992 and 1996 the pass-through from the monetary-policy interest rates to the banks' interest rates was generally a little higher for the discount rate than for the lending rate, cf. Table 1. This indicates that the banks are more inclined to adjust their

PASS-THROUGH FROM DANMARKS NATIONALBANK'S INTEREST RATES TO THE BANKS' AVERAGE INTEREST RATES Table 1

	Average change in percentage points on a 1-per-cent change in	
	Danmarks Nationalbank's lending rate	Danmarks Nationalbank's discount rate
1st quarter 1992 – 4th quarter 2006	Same quarter (β)	Same quarter (β)
The banks' lending rate [1]	0.50*	0.68*
The banks' deposit rate	0.53*	0.78*
4th quarter 1995 – 4th quarter 2006		
The banks' lending rate	0.77*	**0.85***
The banks' deposit rate	0.72*	0.82*

Note: The method is described in Box 2. The constant is not shown, but is equal to 0 in most cases. * denotes that the coefficient is significant at the 5 per-cent level. Bold type indicates that the coefficient (at the 5 per-cent level) can well be equal to 1, i.e. the pass-through is complete. Heteroscedasticity- and autocorrelation-consistent standard deviations are applied. The banks' interest rates are weighted averages of the interest rates for general government, non-financial corporations and households, i.e. excluding the MFI sector and other financial corporations. The period from 1992 is chosen since the key principles in the current range of monetary-policy instruments were introduced in 1992. The model is estimated on the basis of quarterly data and by and large all lagged values are non-significant.
Source: Danmarks Nationalbank and own calculations.
[1] Adjusted for earlier data breaks.

interest rates in step with changes in the discount rate than in the lending rate. The discount rate is a signal interest rate that expresses the overall level of the monetary-policy interest rates. Changes in Danmarks Nationalbank's lending rate can occur more frequently and more gradually than changes in the discount rate, e.g. in periods with short-lived foreign-exchange unrest, where the banks often keep retail interest rates unchanged. Since adjusting retail interest rates entails certain costs, the banks normally only change their interest rates when they expect the adjustment of the monetary-policy interest rate to be of a more permanent nature.

In 2003, Danmarks Nationalbank introduced new monthly interest-rate statistics which make it possible to conduct a more detailed analysis of the pass-through to the banks' interest rates on a monthly basis. The results should be interpreted with some caution, however, since the period is short and the monetary-policy interest rates have been constant for most of that period. For the period after 2003, the same results are obtained for respectively Danmarks Nationalbank's lending rate and discount rate, since changes in the two interest-rate series have been virtually identical. Below, only changes in the discount rate are therefore analysed.

When the discount rate is adjusted, the banks' interest rates on outstanding amounts change in the same or the following month, cf. Table 2. Analysis of new lending yields the same results, but with greater pass-through in the same month as the monetary-policy interest rate is adjusted. It is seen that the pass-through is complete for both the deposit and lending rates on new business. The statistics for new business in a given month reflect the current market conditions and may be influenced by customer and/or product structures from month to month.

PASS-THROUGH TO THE BANKS' AVERAGE INTEREST RATES — Table 2

January 2003 - December 2006	Average change in percentage points on a 1-per-cent change in the discount rate		
	Same month (β)	Month after (β_1)	Total
Outstanding amounts			
The banks' lending rate	0.43*	0.33*	0.76
The banks' deposit rate	0.57*	0.35*	**0.92**
New business			
The banks' lending rate	0.99*	0.42*	**1.41**
The banks' deposit rate	0.78*	0.19*	**0.97**

Note: See note to Table 1. The total indicates the sum of the coefficients, i.e. the total pass-through. However, it should be noted that the total new lending is close to being significantly different from 1 (at the 5 per-cent level). Estimated on the basis of monthly data.

Outstanding amounts comprise loans that have been raised over a longer period, so that the interest rate also reflects the historical development in interest rates.

PASS-THROUGH TO RETAIL INTEREST RATES BY SECTOR AND PURPOSE

As from the 4th quarter of 1995, the banks' interest rates can be broken down into households and corporations. The lowest pass-through from the monetary-policy interest rate is to the interest rate for deposits from households, cf. Table 3. This may be related to more rigid adjustment, in view of the low level of interest rates. The pass-through to both the lending and deposit rates for households is still relatively high, however.

For corporations, there is less variation in the pass-through to respectively the lending and deposit rates, possibly because interest rates for business loans are to a greater extent subject to negotiation of terms for both loans and deposits. In addition, competition from other sources of financing in Denmark and abroad may also contribute to higher pass-through to interest rates for corporations.

After 2003, the data can be broken down by purpose and maturity. A large proportion of lending for housing purposes has a maturity exceeding 5 years, and the pass-through to the interest rate on these loans is slightly more delayed than to the interest rate on loans with shorter maturities, cf. Table 4. The segment with longer maturities reflects loans at both fixed and adjustable interest rates. The pass-through is relatively rapid, which indicates that a large part of this segment comprises loans at adjustable interest rates. For interest rates on lending to corporations, the pass-through also diminishes with maturity.[1] With regard to interest rates for consumer loans and other loans, i.e. lending to households for other than housing purposes, the pass-through is not complete. On the other hand, the pass-through to the deposit interest rates is high.

Applying the analysis to new lending to households for housing purposes, the pass-through is high for the fixed-interest period of up to 1 year, but is not significant for other fixed-interest periods (not shown in Table 4). One explanation is that interest rates on loans with a long fixed-interest period are to a high degree dependent on other factors than changes in Danmarks Nationalbank's interest rates.

[1] The two β coefficients for interest rates on lending to corporations with maturities of respectively less than 1 year and over 5 years are shown by statistical tests not to be identical.

PASS-THROUGH TO THE BANKS' AVERAGE INTEREST RATES BY SECTOR Table 3

4th quarter 1995 – 4th quarter 2006	Average change in percentage points on a 1-per-cent change in the discount rate Same quarter (β)
Lending rate, households	**0.82***
Lending rate, corporations	**0.82***
Deposit rate, households	0.68*
Deposit rate, corporations	**0.91***

Note: See note to Table 1. The total is the sum of the coefficients, i.e. the total pass-through. Prior to 2002, the statistics adhere to the Danish Financial Supervisory Authority's breakdown by sector, while for the period 2002-06 they follow Statistics Denmark's breakdown. Estimated on the basis of quarterly data.

PASS-THROUGH TO THE BANKS' AVERAGE INTEREST RATES BY SECTOR, PURPOSE AND MATURITY Table 4

January 2003 – December 2006	Average change in percentage points on a 1-per-cent change in the discount rate Same month (β)	Month after (β_1)	Two months after (β_2)	Total
Outstanding amounts				
Lending rates				
Households	0.45*	0.39*		0.84
Households, housing purposes < 1 year	0.61*	0.57*		1.18
Households, housing purposes > 5 years	0.52*	0.39*	0.17*	1.08
Households, excluding housing purposes	0.33*	0.37*		0.70
Corporations	0.42*	0.34*		0.76
Corporations < 1 year	0.59*	0.27*		0.87
Corporations > 5 years	0.16	0.47*		0.63
Deposit rates				
Households	0.52*	0.35*		0.87
Corporations	0.60*	0.37*		0.97
New business				
Households, housing purposes < 1 year	0.71*	0.70*		1.41

Note: See note to Table 1. The total is the sum of the coefficients, i.e. the total pass-through. The statistics adhere to Statistics Denmark's breakdown by sector. Estimated on the basis of monthly data. Outstanding amounts are here divided into maturities of respectively less than 1 year and over 5 years, while new business is defined by a fixed-interest period of up to 1 year.

PASS-THROUGH TO RETAIL INTEREST RATES BY BANK SIZE

Average interest rates vary from bank to bank. In December 2006, most of the banks had an average lending rate in the range of 6.0-6.9 per cent, cf. Box 3. Below, the 24 banks reporting to Danmarks Nationalbank's interest-rate statistics at end-2006 are divided into two groups.[1]

[1] Grouping is according to the Danish Financial Supervisory Authority's groups based on working capital.

DIFFERENCES IN LENDING RATES FOR INDIVIDUAL BANKS Box 3

The banks' interest rates vary between banks, cf. the Chart. This may be due to variations in prices for the same products, but to a high degree also to different products and customer structures, where customers' creditworthiness and also the level of collateral vary. In December 2006, there was a certain degree of variation among the banks, but the interest rates of most of the banks for both outstanding and new lending to households were in the range of 6.0-6.9 per cent per annum.

The average interest rates on new lending for a given month reflect the actual lending and deposit agreements. This means that the development in interest rates from month to month may be affected by the customer and/or product breakdown. At individual bank level, the interest rate for new lending can thus be very volatile, and therefore interest rates on outstanding loans are applied to the regressions at bank level.

DISTRIBUTION OF THE BANKS' INTEREST RATES (PER CENT PER ANNUM) ON OUTSTANDING AND NEW LOANS TO HOUSEHOLDS, DECEMBER 2006 Chart

Group 1 comprises the five largest banks that account for approximately 70 per cent of the total lending volume measured by outstanding loans at end-December 2006, while group 2 comprises the rest.[1]

Considering first the quarterly data since 1995, the pass-through from changes in the monetary-policy interest rates to the interest rates for both households and corporations is generally high in both bank groups, cf. Table 5. Statistical tests show that the pass-through for the two groups can well be identical.

[1] To obtain a consistent quarterly series for the period back to the 4th quarter of 1995, a few banks are excluded from the groups, however.

PASS-THROUGH TO THE BANKS' INTEREST RATES BY GROUP, LONG PERIOD Table 5

4th quarter 1995 – 4th quarter 2006	Average change in percentage points on a 1-per-cent change in the discount rate	
	Group 1	Group 2
	Same quarter (β)	Same quarter (β)
Lending rate, households	**0.79***	0.73*
Lending rate, corporations	0.67*	0.65*
Deposit rate, households	0.62*	0.70*
Deposit rate, corporations	**1.16***	**0.84***

Note: See note to Table 1. Virtually all lagged values are non-significant. Prior to 2002, the statistics adhere to the Danish Financial Supervisory Authority's breakdown by sector, while for the period 2002-06 they follow Statistics Denmark's breakdown. Estimated on the basis of quarterly data.

In the period after 2003, there is a tendency for more rapid pass-through to the interest rates on lending to households from the large banks than from the smaller banks, cf. Table 6. For the large banks, a substantial part of the pass-through to the interest rates on lending to households takes place in the same month as the monetary-policy interest rate is adjusted, while for the smaller banks the interest-rate pass-through to a slightly greater extent takes place in the following month.

The variation in the pass-through among the banks in terms of lending to households can be explained by such factors as differing product ranges and lending structures among the groups. The interest rate on mortgage loans is tied to the monetary-policy interest rates. Since 2003, especially the large banks have offered these new housing loan products, cf. Chart 4.

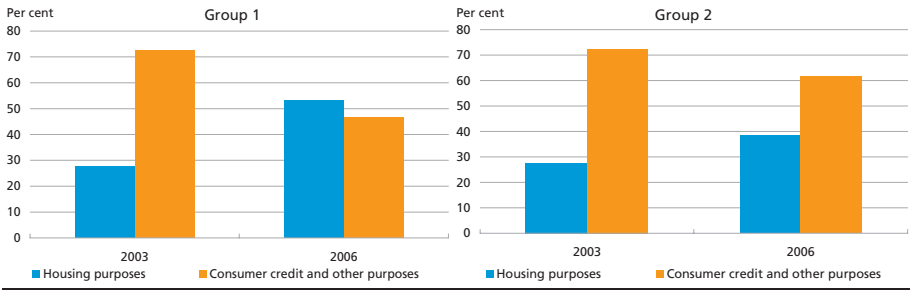
In terms of the pass-through to the interest rates for corporations, there is no tendency for the large banks to adjust their interest rates first. On the contrary, the pass-through seems to be a little faster for the

PASS-THROUGH TO THE BANKS' INTEREST RATES BY GROUP, SHORT PERIOD Table 6

January 2003 – December 2006	Average change in percentage points on a 1-per cent change in the discount rate						
	Group 1				Group 2		
	Same month (β)	Month after (β_1)	Two months after (β_2)	Total	Same month (β)	Month after (β_1)	Total
Lending rate, households	0.54*	0.31*		**0.84**	0.28	0.59*	**0.86**
Lending rate, corporations	0.35*	0.25*	0.19*	**0.79**	0.51*	0.50*	**1.01**
Deposit rate, households	0.58*	0.31*		**0.88**	0.36*	0.46*	**0.83**
Deposit rate, corporations	0.59*	0.38*		**0.97**	0.72*	0.31*	**1.03**

Note: See note to Table 1. The statistics adhere to Statistics Denmark's breakdown by sector. Estimated on the basis of monthly data.

THE BANKS' OUTSTANDING LENDING TO HOUSEHOLDS BY GROUP AND PURPOSE Chart 4



Note: The figures are for December 2003 and December 2006.
Source: Danmarks Nationalbank.

smaller banks. One explanation may be that more of the large banks' customers are large business enterprises that are in a position to negotiate prices.

COMPARISON WITH OTHER COUNTRIES

In recent years the interest-rate pass-through in other countries has also been subject to empirical analysis. Comparison with the results from other countries shows that the size and speed of the interest-rate pass-through is dependent on several factors and varies between countries. In January 2003, the euro area member states and Denmark introduced harmonised interest-rate statistics that facilitate cross-border comparison of retail interest rates on a larger scale than before. There are still considerable national variations, however, and only a short period is covered. Variations in financial structures and products impede direct comparison of the results for other countries with Denmark's results in this article since the empirical methods applied also vary. However, some of the key conclusions can be compared with those found in other studies.

For many countries, the pass-through from the monetary-policy interest rates or money-market interest rates to the banks' interest rates is high in the long term, but more rigid in the short term, see e.g. De Bondt (2002) and Kwapil and Scharler (2006). Often, changes in the monetary-policy interest rates or money-market interest rates have not been fully passed through to the banks' interest rates after three months. Coffinet (2005) finds that the pass-through to retail interest rates took between one and seven months in France, while in the euro area it took between two and eight months in the period 1999-2003. The results in this article therefore indicate that the pass-through in Denmark is a little faster.

The variations between countries are confirmed by the analysis of bank interest rates in the euro area by Sørensen and Werner (2006). They state variations in national degrees of competition as one possible explanation. Considering their product-specific results, as in this article they find greater pass-through to interest rates on mortgage loans than to interest rates on consumer loans. The same tendency is found by Baugnet and Hradisky (2004). The analyses also show that the pass-through to interest rates on loans to households is lower than the pass-through to interest rates on loans to corporations. The results in this article indicate a high pass-through to interest rates on loans to households. The reason may be that bank products for e.g. housing purchases to a larger extent bear adjustable interest rates in Denmark than in other countries.[1] The large banks in Denmark are the first to change their interest rates for households after monetary-policy interest rates are adjusted. This is corroborated by Deutsche Bundesbank (2002), which also notes the same tendency for interest rates on loans to corporations.

Overall, the results in this article indicate that the pass-through from the monetary-policy interest rates to the banks' interest rates is relatively rapid in Denmark compared to other countries.

[1] It should be noted that in Denmark most lending against owner-occupied housing as collateral is provided via the mortgage-credit market, while in other countries it is provided via the banks. This entails that fixed-rate loans are to a great extent offered by the mortgage-credit sector in Denmark, but in other countries by the banking sector.

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Price Setting Behaviour in Denmark

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INTRODUCTION AND SUMMARY

For many years, prices in Denmark have shown a relatively stable development. Since 1990, average annual inflation has been slightly above 2 per cent. In a well-functioning market economy, average price stability by no means entails that all prices are stable, however. On the contrary, rising or falling prices signal which goods are in short, or ample, supply. The more stable prices are on average, the stronger the signal effect of individual price changes. This is why Danmarks Nationalbank, like other central banks, seeks to keep prices stable on average, but is not in favour of controlling individual prices, since control prevents the price mechanism from signalling a shortage or a surplus. Frequent price changes can thus be perceived as a sign of health.

On average, 17.3 per cent of all Danish consumer prices are adjusted in a given month. This is shown by a study of the detailed prices collected by Statistics Denmark for calculation of the Danish CPI, cf. Hansen and Hansen (2006). This is around the same adjustment frequency as in the euro area, while prices in the USA are more flexible.

These results are by no means controversial in relation to modern macroeconomic theory and thinking, where price stickiness is a standard assumption that plays an important role in the inflation process and for how an economy reacts when exposed to a wide range of shocks. For example, monetary shocks such as changes in interest and exchange rates will, all other things being equal, have a greater impact on economic activity when prices are adjusted slowly. Despite recent decades' extensive theoretical literature on price stickiness at micro level, and its significance to e.g. the functioning of monetary policy, there have been surprisingly few empirical studies of micro data for price setting behaviour. Most of these have been based on a limited number of products and price observations. Bils and Klenow (2004) are the first to systematically analyse the detailed price information behind the US CPI, and thereby to cover a substantial proportion of the households' expenditure basket. Equivalent analyses have subsequently been conducted for a number of other

countries. This article describes the first analysis of this type of the detailed price data behind the Danish CPI.

The applied data covers the period 1997-2005 and comprises around 2.7 million monthly price observations. The material reveals considerable variations across sectors and products in terms of the frequency and size of the price changes. The prices of unprocessed food and energy are clearly the most flexible, with price changes for, on average, around half of all products in the course of a month. Only around 10 per cent of prices for processed food, industrial goods and services are changed every month. Almost 40 per cent of price changes are a price decrease, so that prices are not in general more rigid downwards than upwards. The prices of a number of products are adjusted at regular intervals or in typical months, e.g. in connection with bargain sales, while prices of other products do not follow any clear timing pattern. Generally, the price changes are high compared with the inflation rates that can be observed from the aggregate price indices, and the price decreases are typically a little higher than the price increases.

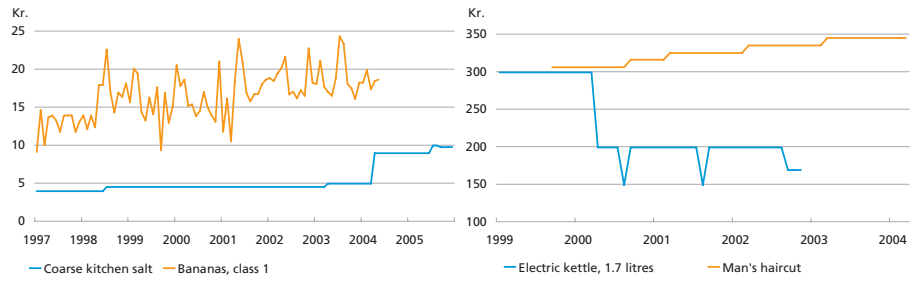
The significance of these results to the inflation process is analysed by simple correlation analyses. They show aggregate inflation to be positively (negatively) correlated with the frequency of price increases (price decreases), while inflation does not seem to be correlated with the size of the price changes.

DATA AND METHOD

On a monthly basis, Statistics Denmark collects around 25,000 prices in order to calculate the Danish CPI. Most of the collected prices can be attributed to a specific product in a specific retail outlet at a certain time, but due to the statistical confidentiality restriction neither the names nor locations of the outlets can be identified.

Chart 1 presents examples of individual price series, selected for their typical patterns. The price setting behaviour clearly varies substantially, and the average length of the period between two price changes – also called the duration of a price spell – varies considerably between products. The price of bananas is changed frequently, normally at least once a month. On the other hand, prices of other types of food vary far less frequently, as illustrated by the price of salt. The frequency and size of price changes are to a high degree related to the type of product. Bananas – in contrast to e.g. salt – cannot be stored for a long period, and their prices may be changed frequently in order to sell them before their "sell-by date" is reached. The price history for electric kettles is another example of how certain prices are infrequently changed, but

EXAMPLES OF INDIVIDUAL PRICE SERIES Chart 1



Note: The missing prices reflect that the product was not included in the sample at the time in question.
Source: Statistics Denmark.

also of significant adjustment of the price level when e.g. a new model appears in the shops, as well as of temporary reductions in a bargain sale. Likewise, the prices of many types of services, in this case a man's haircut, are infrequently changed, and often at certain times of the year, if they are.

The quality of the dataset is generally high and well-suited for our analysis. For various reasons, just over 100,000 price observations were eliminated, the majority being administered prices, i.e. prices that are subject to a high degree of government regulation (e.g. public transport and childcare). This is because we are only interested in analysing the market-determined price setting.

In order to make the study comparable with similar studies in other countries the data is divided into five relatively homogenous product groups, namely 1) unprocessed food, 2) processed food including alcohol and tobacco, 3) energy, 4) non-energy industrial products, and 5) services.

The analysis focuses on the frequency and size of the price changes and their covariation with aggregate inflation. For this purpose, aggregate statistical measures are set up, whereby respectively the frequency and size of the price changes are first compiled as simple averages for each product category; then the aggregates are calculated as weighted averages by applying official HICP weights published by Statistics Denmark. At the most detailed level, around 450 product categories are individually weighted.

The filtered dataset constitutes around 85 per cent of HICP's weight basis, cf. Table 1. Especially the weight of services has been reduced, which reflects that most of the administered prices lie within this group. In terms of observations, unprocessed food is clearly overrepresented, representing 25 per cent of all observations in the dataset, despite having a weight of only 7 per cent (6.0/85.2).

DATA DESCRIPTION Table 1

	Official HICP weight	Weight after filtering	Number of price observations	Average length of price series
Unprocessed food	6.0	6.0	661,857	14.6
Processed food	14.1	14.1	572,576	20.8
Energy	10.7	10.7	25,290	69.1
Non-energy industrial goods	30.7	28.5	1,054,853	19.9
Services	38.5	25.9	308,913	32.2
All items	100.0	85.2	2,623,489	19.3

Note: The weights are stated in per cent, while the average length of price series is stated in months. The weights are calculated as an average of the two official weight schemes based on the breakdown of consumption in 1999 and 2003.
Source: Statistics Denmark and own calculations.

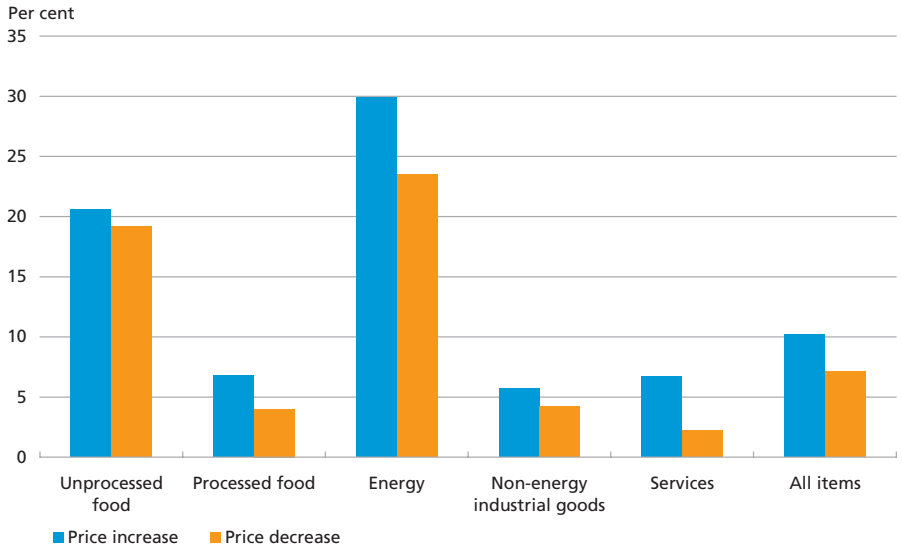
HOW OFTEN ARE PRICES ADJUSTED?

On average, 17.3 per cent of prices are adjusted in a given month – 10.2 per cent of prices are raised, and 7.1 per cent are lowered, cf. Chart 2. This means that around 40 per cent of all price changes are reductions, so that prices are not in general more rigid downwards than upwards.

The frequency of price increases and reductions varies considerably across product categories. The prices of energy and unprocessed food are clearly the most flexible. Overall, more than half of all energy prices are changed monthly. This confirms that these two components are also the most volatile at aggregate level, and they are typically omitted from the calculation of core inflation. Energy is composed of items of which prices are changed several times in the course of a month, e.g. fuel at the petrol station, and also other items of which prices are changed infrequently. One example is district heating, of which the price is typically adjusted once a year. For unprocessed food, especially fruit and vegetable prices are very flexible. For example, 92.7 per cent of the collected banana prices are changed on a monthly basis, cf. above.

The greatest price stickiness is observed for services, closely followed by processed food and industrial goods. Only 2.2 per cent of prices for services are lowered per month on average, equivalent to one fourth of all price changes for services. Considering the underlying service items, it is seen that especially restaurant prices are rarely lowered. Only 0.2 per cent of prices for a cup of coffee are reduced from one month to the next. This pattern presumably reflects that the production of services is very labour-intensive, so that stickiness in wage development is reflected in price setting.

MONTHLY FREQUENCY OF PRICE INCREASES AND DECREASES, 1997-2005 Chart 2



Source: Statistics Denmark and own calculations.

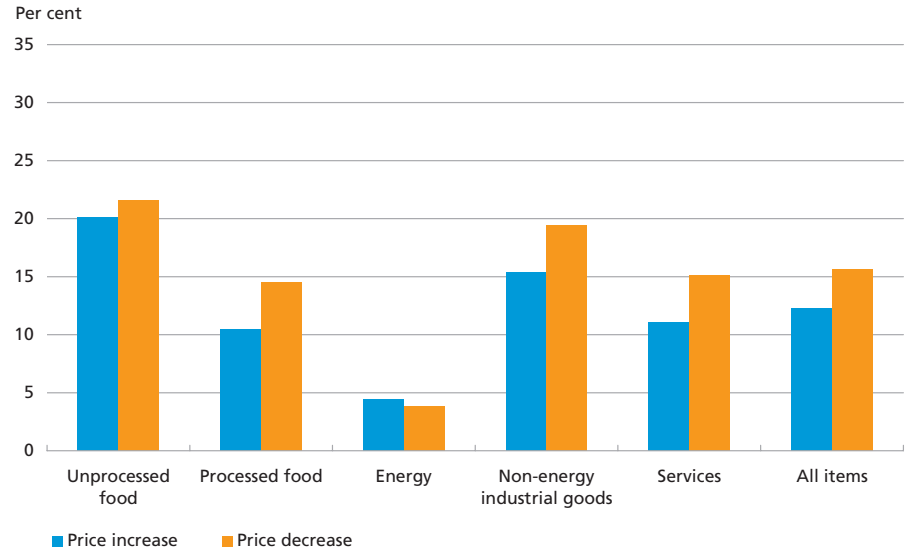
To a degree, the ratio of prices changed in a given month varies over time, and the price movements for some products seem to adhere to a seasonal pattern. This e.g. applies to many unprocessed foods that are sensitive to weather conditions and seasonal variations, just as the prices of a number of industrial goods, e.g. clothing, are influenced by regular bargain sales. For other products such as insurance, district heating or electricity, prices are only changed at particular times. The ratio of prices that are changed in a given month may also be affected by changes in indirect taxes. This was clearly apparent in connection with the cross-frontier-trade package that entered into force in Denmark on 1 October 2003, where reductions of excise duties on alcohol and cigarettes led to strong price decreases for these products in the same month.

THE SIZE OF PRICE CHANGES

Chart 3 shows that, on average, price changes are considerable.[1] The typical price increase is by 12.3 per cent, and the size of price decreases is even higher, at 15.6 per cent. This clearly exceeds the inflation rates that can be observed from the aggregate price indices.

[1] The price changes are compiled as log differences. In the case of small price changes, this by and large corresponds to the percentage change. The advantage of log differences is that price changes that in krone terms are identical, but in different directions, lead to the same numerical price change measured in log differences. This is not the case for percentage calculations. For example, a price change from kr. 100 to kr. 125 corresponds to an increase by 25 per cent, while the opposite price change corresponds to a decrease by 20 per cent.

SIZE OF PRICE CHANGES, 1997-2005 Chart 3



Source: Statistics Denmark and own calculations.

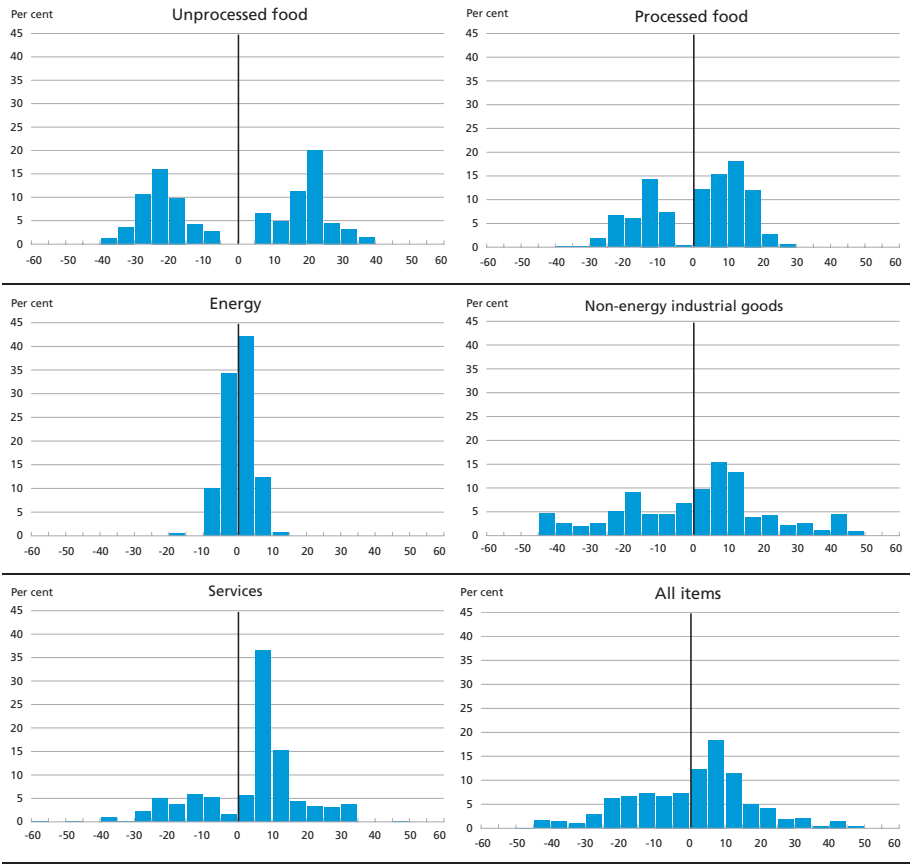
Price changes for unprocessed food are the highest, which is not surprising since these are perishable goods of which the supply is influenced by the weather and the seasons. Moreover, the price elasticity of these foods is probably small: if a batch of bananas, for example, is to be sold before the end of the week, it can be necessary to reduce the price considerably. The smallest price changes are for energy, which reflects both the frequent, moderate price changes for fuel at petrol stations, and the annual adjustments of prices for e.g. district heating and electricity.

Chart 4 shows the distribution of the price changes by size. The largest share of the distribution is placed to the left of the zero point, since, as stated above, prices are slightly more often raised than lowered. This is especially apparent for services, which account for the smallest share of price decreases.

There are obviously significant variations in the distributions across product groups. For unprocessed food, the distribution is almost symmetrical around the zero point, with many large price changes, and virtually no price changes below 5 per cent. For energy, almost all price changes are below 10 per cent, while price changes for industrial goods show greater dispersion, with a certain proportion of very large price adjustments.

Unlike frequency, the size of price changes does not show a clear seasonal pattern. The clearest sign of seasonal variation is for industrial

DISTRIBUTION OF THE SIZE OF PRICE CHANGES, 1997-2005 Chart 4



Note: The X axis indicates the percentage price change, measured in log differences.
Source: Statistics Denmark and own calculations.

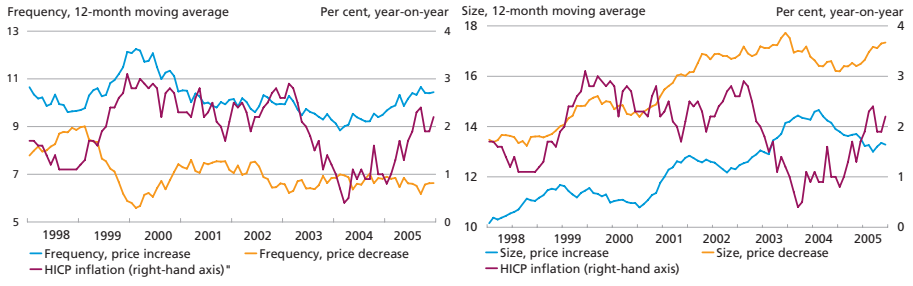
goods, with summer and winter sales in the retail sector leading to large price decreases.

WHAT DRIVES INFLATION – THE FREQUENCY OR THE SIZE OF PRICE CHANGES?

There is considerable variation in both the frequency and the size of price changes. On this basis, it is interesting to investigate whether there is a connection between these micro-based observations and the development in aggregate inflation.

To gain a first-hand impression of the covariation between aggregate inflation and the frequency and size of price changes, we compare year-on-year inflation rates with 12-month moving averages of the frequency and size of price increases and reductions, cf. Chart 5.

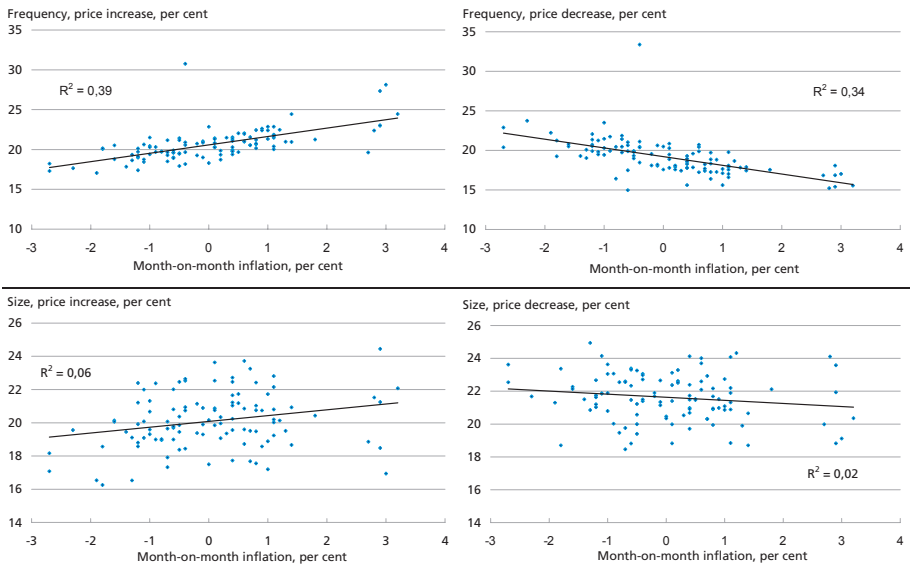
FREQUENCY, SIZE AND YEAR-ON-YEAR INFLATION Chart 5



Note: Y axis in per cent.
Source: Statistics Denmark and own calculations.

The increase in overall inflation from 1 to 3 per cent in 1999 was clearly related to a higher frequency of price increases and a lower frequency of price decreases. This indicates that the increase in inflation in 1999 was driven by a larger relative price-increase ratio. On the other hand, the development in the size of the price changes does not contribute to explaining the upturn in the inflation rate, since the size of price increases during the same year diminished slightly, while the size of price decreases rose. The same applies to the development in inflation from 2003 to 2005. In this case, the decrease in inflation in 2003 appears to be related to a lower ratio of price increases to price decreases, while the size of price increases and decreases over the same period again took

FREQUENCY, SIZE AND MONTH-ON-MONTH INFLATION – UNPROCESSED FOOD Chart 6



Source: Statistics Denmark and own calculations.

the "wrong" course in terms of explaining the development in inflation. The tendency for inflation to be driven by the frequency, and not the size, of price changes becomes even more apparent when the individual product categories are considered, since the frequencies and sizes calculated for the overall dataset conceal considerable heterogeneity.

To obtain a more accurate picture of this covariation, we consider cross plots of month-on-month aggregate price-increase rates by product categories on the one hand, and respectively the frequency and size of price increases/decreases on the other. In general, this confirms that the frequency of both price increases and decreases is correlated with the month-on-month inflation rates, and with the correct sign. On the other hand, the correlations between size and month-on-month inflation are very small. In Chart 6 this is shown for unprocessed food, where the correlation is most apparent, but it also applies to the other product categories, with non-energy industrial goods as an exception.

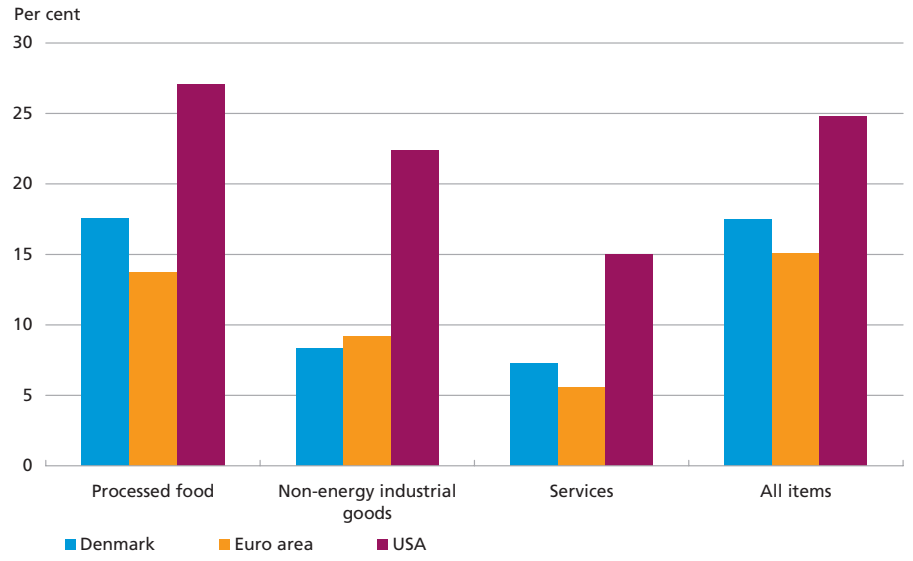
PRICE SETTING BEHAVIOUR IN DENMARK COMPARED TO THE EURO AREA AND THE USA

Price setting in the USA and the euro area is analysed by respectively Bils and Klenow (2004) and Dhyne et al. (2005).[1] The period studied in the two analyses does not completely match ours, but all studies refer to periods of low inflation.

Chart 7 shows the frequency of price changes in Denmark, the euro area and the USA across product categories. In order to make the differences within the categories where prices are changed infrequently more apparent, the volatile groups of unprocessed food and energy are excluded. As stated, these two components are typically eliminated from the compilation of core inflation. In principle, there is no particular reason to believe that the price setting for perishable food products differs significantly from country to country, and nor is this the case. On the other hand, when comparing price setting in the energy sector across countries it should be borne in mind that while the price of fuel varies considerably in most countries, there can be large differences in, for example, the length of the price contracts offered to consumers for deliveries of electricity, gas and district heating. In addition, there can be great variation among countries in the ratio of homes with district heating or oil-burning furnaces.

[1] The price setting in the individual euro area member states is described in detail by Inflation Persistence Network, IPN, which is a coordinated research project between the European Central Bank and a number of national central banks. Further information on IPN is available at http://www.ecb.int/home/html/researcher_ipn.en.html.

MONTHLY FREQUENCY OF PRICE CHANGES Chart 7



Note: The category "All items" includes unprocessed food and energy.
Source: Dhyne et al. (2005) and Hansen and Hansen (2006).

The frequency of price changes for processed food and services is slightly higher in Denmark than in the euro area, while the frequency of price changes for industrial goods is marginally lower in Denmark. In the USA, the prices in the three categories are adjusted a good deal more frequently; for example, the frequency of monthly price changes for industrial goods and services is more than twice as high as in the other two areas. This is a remarkable difference which cannot be explained solely by the fact that the aggregate monthly inflation rates in the USA were also generally a little higher in the period analysed. The stickier European consumer prices may reflect a higher degree of regulation of labour and product markets than in the USA. If the development in European wages and other costs is stickier, this can contribute to more rigid price setting.

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Index-Linked Bonds

Anne-Sofie Reng Rasmussen, Market Operations

INTRODUCTION

In the late 1990s, Danish banks began to market a new financial product, index-linked bonds[1]. This product is comprised of a conventional bond and an option linked to the development in e.g. equities, exchange rates or commodity prices.

Despite critical press coverage[2], index-linked bonds have become a large sales success for Danish banks. At the beginning of May 2007, the nominal outstanding volume of index-linked bonds listed on the Copenhagen Stock Exchange was almost kr. 55 billion.

The volume of index-linked bonds issued has grown considerably in recent years. At the same time, the products have become increasingly complex, and issuers have been very innovative in their choice of underlying assets. This development makes it more difficult for investors to assess what they are actually buying, and what they are paying for it. This unavoidably increases the need for investor information and guidance in connection with such investments. It is not necessarily sufficient for the investor to rely on the information material received from the seller of the index-linked bond.

INDEX-LINKED BONDS

An index-linked bond of the type discussed in this article is a package comprised of a conventional bond and an option. The bonds are usually zero-coupon bonds. Unlike a conventional bond, which has a fixed coupon yield, an option is linked to the index-linked bond, a structure that entails some tax advantages, cf. Box 1.

1 The index-linked bonds described in this article are also known as structured bonds or guaranteed bonds.

2 See e.g. the articles from the Danish newspaper *Børsen* referred to in the literature list.

TAXATION Box 1

For tax purposes, index-linked bonds are treated as financial contracts and thus as one single package, cf. Jakobsen (2000). This entails that the costs relating to the closure of the option contract without a positive payoff can be offset against the capital gain on the zero-coupon bond in the package. If the private investor had instead bought the zero-coupon bond and the option separately, he would not have been able to deduct the costs of the option contract from capital gains on the bond. In this case the costs of the option can only be offset against capital gains on equivalent contracts. Private individuals' investments of liquid funds in these index-linked bonds are taxed as capital income.

The final payoff to the investor consists of a guaranteed payment stemming from the zero-coupon-bond element of the package, as well as an option payoff that is dependent on the development in a pre-selected underlying asset. The option payoff is not known until the bond matures, and in the worst case may be zero.

The underlying asset can be e.g. the development in a given exchange rate, a stock index, various commodities, interest rates or different macroeconomic indicators. The product enables the investor to speculate in these relatively high-risk assets, but offers protection against any substantial depreciation in the value of the assets via the guaranteed minimum payment at maturity. The price of this protectt-tion, or rather of the possible gain, is the loss of the yield that the investor would have received on a conventional instrument such as a government bond.

THE ISSUANCE PROCEDURE

A special feature of index-linked bonds is that the return is linked to the development in an underlying asset, while no fixed coupon payment is received. This section describes the issuance procedure for such bonds and the roles of the parties involved.

Typically, the first step before offering an index-linked bond for sale is to select the underlying asset and determine the link between the bond yield and the development in this asset. In many cases, the issuer wishes an index-linked bond to be based on a specific theme. This might be expectations of a strengthening of the Icelandic krona vis-à-vis the Danish krone, the development in a US stock index, or a general upswing in the Asian economies. The chosen scenario determines the

option element of the index-linked bond and thus the bond's specific return profile. An important issue in this context is: what determines the choice of scenario on which the index-linked bond is based? Is there a financial rationale behind the structure?

The first index-linked bonds issued in the Danish market were often linked to a single stock index or exchange rate. Issues in recent years have, however, reflected a much wider range of investment strategies. Some are linked to baskets of currency pairs, while others depend on the development in portfolios of different assets such as equities, exchange rates and commodities. The product can be structured in countless different ways. Some of the most prevalent option types are described in Box 2.

Once the provider has determined a scenario, an issuer is contacted, typically an issuer with a sound credit rating, i.e. AAA to AA. The issuer lends its name and reputation to the index-linked bonds in order to minimise the credit risk on the principal guarantee. In most cases, however, the issuer does not wish to assume the risk in relation to the speculative option position in the index-linked bond. Normally, the issuer therefore fully hedges the option risk so as to eliminate all risk in relation to the development in the underlying asset. Part of the proceeds from the issue of the index-linked bonds is thus used to purchase options, while the remainder constitutes the price of the zero-coupon bonds in the structure.

In general, the provider of the index-linked bond arranges the hedging of the option for the bond issuer. The provider contacts a number of international investment banks in order to obtain bids for the option element of the structure. The provider and issuer of the index-linked bonds do not necessarily have the capacity to calculate a fair price for the option, but rely on the competition among the international investment banks to ensure a fair price. The seller of the option makes a bid for the option price, based on the prevailing market terms. The strike price of the option is determined on the date of issue of the index-linked bond, which is when the final conditions for the index-linked bond are laid down.

The above description of the issuance process makes it clear that there are three sources of costs behind the index-linked bond: the provider, the issuer, and the seller of the option. The costs to the investor of investing in the index-linked bond thus not only comprise the issuance costs and the sales and marketing costs, etc. payable to the provider – which are often stated in the bond prospectus – but also the proceeds to the issuer of the bond and the seller of the option.

PREVAILING OPTION TYPES Box 2

Index-linked bonds come in many flavours. The reasons are that they are linked to many different underlying assets, e.g. equities, exchange rates, commodities, property indices, etc., and that the related option can be structured in many ways. The structure chosen determines how the final return on the bond is calculated, based on the change in the underlying asset. Some of the most frequently used structures are listed below.

Plain vanilla

A plain vanilla option is the simplest form of related option. One example of an index-linked bond with a built-in plain vanilla option could be a currency-indexed bond linked to the development in the Icelandic krona vis-à-vis the Danish krone. The structure of the bond might entail that at maturity the investor receives the nominal value of the bond, e.g. kr. 1,000, plus 150 per cent of any appreciation of the Icelandic krona against the Danish krone. The appreciation is calculated as the change in the exchange rate from the bond's issue date to its maturity date. If the appreciation is by 10 per cent, and the investor is to receive 150 per cent of this appreciation, the investor ultimately receives kr. 1,000 + 0.1 * 1.5 * kr. 1,000 = kr. 1,150, of which kr. 1,000 is the nominal value of the bond. The 150 per cent is also referred to as the bond's participation rate. If the Icelandic krona has depreciated, the investor only receives kr. 1,000.

Asian

In some cases, the change in the underlying asset is calculated as the difference between the value on the bond's issue date and the average value of the asset on a number of selected dates during the bond's term. This minimises the exposure of the final return to day-to-day fluctuations. However, it also contributes to reducing the value of the option in relation to a plain vanilla option.

Basket

Instead of basing the return on the bond on a single asset, the issuer may link the return to the development in a basket of assets. The return on the bond may e.g. depend on the development in the Brazilian real, the Mexican peso and the Turkish lira vis-à-vis the euro. The return will depend not only on the development in the three currencies, but also on their mutual covariation.

Himalaya

Some bonds are linked to Himalaya options whereby the return on the bond depends on the development in 6-7 underlying assets. These could be a number of stock indices, a commodity index and selected currency pairs. Every six months, for example, the return on the underlying assets is measured. The return on the best performer is locked and this asset is removed from the underlying asset basket. Six months later, the exercise is repeated, except that one asset has been removed. This continues until there are no more assets in the underlying basket. At maturity, the return on the bond is determined as an average of the current locked returns.

THE SECONDARY MARKET

Index-linked bonds are "buy-and-hold" instruments. The bonds are typically purchased on issue and held until maturity, since there is little liquidity in the secondary market for this type of product. If the investor wishes to sell the bond prematurely, the market's illiquidity can make it difficult to obtain a good price[1].

Normally, the maximum loss to the investor is the difference between the bond's market price and its nominal value if the bond is held until maturity. If the investor wishes to sell the bond prematurely, there is no guarantee that the market price will be equal to or higher than the nominal value of the bond.

ISSUANCE VOLUME

The outstanding volume of index-linked bonds listed on the Copenhagen Stock Exchange has increased considerably in recent years, cf. Chart 1.

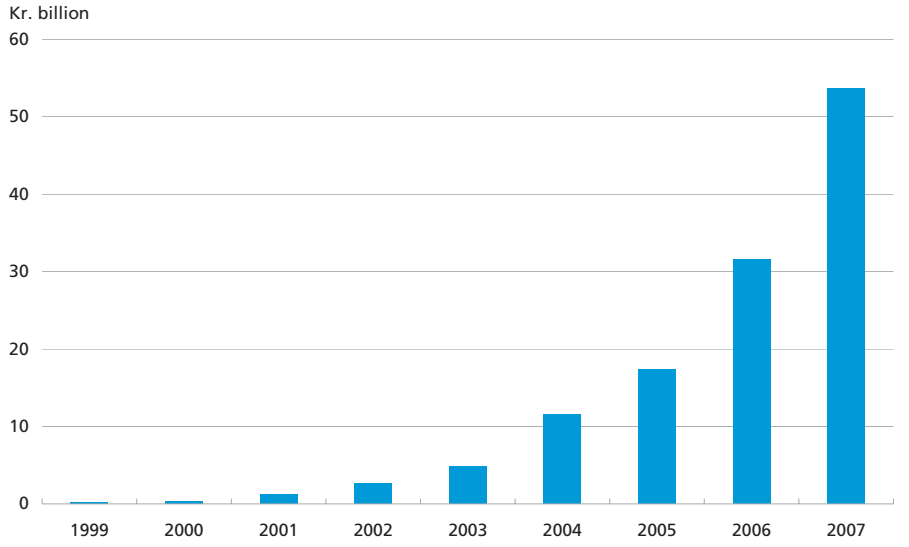
At the beginning of May 2007, the outstanding volume was almost kr. 55 billion. Index-linked bonds have also gained considerable ground in the rest of Europe. Particularly Germany, Italy, Spain and Belgium have seen extensive issue of structured bonds to private investors. The aggregate outstanding bond volume in these four markets was estimated at approximately kr. 3,000 billion at the beginning of 2007[2].

THE INVESTOR'S POSITION

On the face of it, an index-linked bond seems an attractive package for investors who want some risk exposure, combined with a limited risk of loss. Via the index-linked bond, the investor in fact buys a zero-coupon bond and an option on an underlying asset. In principle, the private investor could design an equivalent product simply by buying zero-coupon bonds and options directly. However, the private investor has limited opportunity to trade in the derivatives market. Many of the related options have longer maturities and are more complex than the options available to private investors. The index-linked bonds thus give private investors access to an option market to which they have no direct access. In addition, the providers of index-linked bonds achieve

1 See the article "Small banks bind clients to investments" (in Danish only), *Børsen,* 7 May 2007.
2 www.structuredretailproducts.com

NOMINAL OUTSTANDING VOLUME OF INDEX-LINKED BONDS Chart 1



Note: Volumes at the beginning of the year.
Source: Copenhagen Stock Exchange and own calculations.

certain economies of scale by buying options at a level that is not possible for individual investors.

There are, however, a number of product-specific circumstances to be taken into account. In order to take a closer look at the index-linked bonds and their payment flows, three examples of investment portfolios are presented:

- Portfolio 1: Buy an index-linked bond. Assume that the bond is issued at a premium of 4 and has a guaranteed minimum payment of its nominal value on maturity. If the nominal value of the bond is kr. 1,000, the bond costs kr. 1,040, and the guaranteed payment at maturity is kr. 1,000.
- Portfolio 2: Deposit kr. 1,000 in a non-interest-bearing bank account[1] and invest kr. 40 in an equity portfolio. Again, the total amount invested is kr. 1,040, and the guaranteed final payment is kr. 1,000.
- Portfolio 3: Deposit kr. 1,000 in a non-interest-bearing bank account and spend kr. 40 on a lotto coupon. Once again, the total investment is kr. 1,040, and the guaranteed payment is kr. 1,000.

[1] For simplicity, the rate of interest is set at 0 per cent. Alternatively, assuming a positive rate of interest, it will be possible to deposit less than kr. 1,000 in the bank account and still ultimately achieve a minimum payment of kr. 1,000.

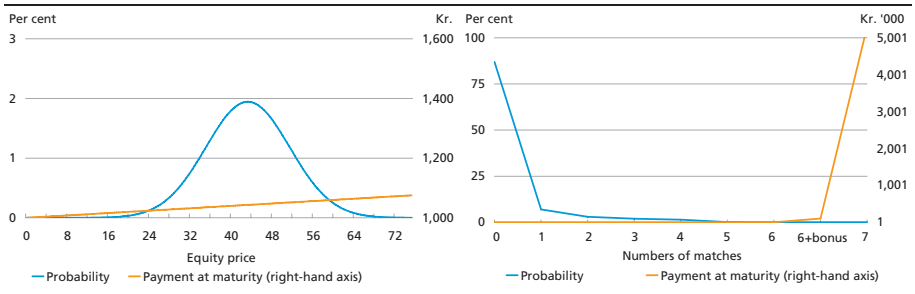
All three portfolios thus require an initial investment of kr. 1,040, offer a guaranteed payment of kr. 1,000 at expiry, and may yield a positive return.

It is nonetheless evident that the three investments are not identical. Chart 2 illustrates the payment profile at expiry for portfolios 2 and 3, as well as the expected underlying probability distribution.

Chart 2 (left) shows that for portfolio 2 a very high positive return is unlikely, but there is a high probability that the final payment will exceed kr. 1,000. Chart 2 (right) shows that for portfolio 3 there is very low probability of a positive return, but that an extremely high return is possible. As long as these probability distributions are transparent, the individual investor can make an informed choice based on his preferences. Things become more complicated if there is no such transparency, i.e. if the investor cannot see whether he is investing in a lotto coupon, a diversified equity portfolio, or an entirely different asset.

The main problem in relation to index-linked bonds is this lack of transparency – in relation to both the actual return profile of the index-linked bond, and the probability that the development scenario described in the prospectus and sales brochure will materialise. This is illustrated in Box 3 on p.63. For an investor to be able to decide whether the index-linked bond is a good investment, he must be able to understand the underlying expected return distribution. It would be misleading to sell the product as a sound investment with low risk if it is in fact a lotto coupon. Likewise, if the investment is merely placed in a non-interest-bearing bank account and a relatively small equity portfolio, the consumer might as well invest the funds himself and avoid the extra costs of the structured bond. The more complex and exotic the option linked to the bond is, the more difficult it becomes to understand the underlying distributions.

PROBABILITY DISTRIBUTION AND PAYMENT PROFILE AT MATURITY FOR PORTFOLIO 2 (LEFT) AND PORTFOLIO 3 (RIGHT) Chart 2



Note: The probability distribution in the left-hand chart assumes a two-year horizon and that the equity price follows a geometrical Brownian motion with a drift rate of 4 per cent p.a. and annual volatility of 14.5 per cent.
Source: www.danskespil.dk and own adaptation.

Another problem for the private investor is that it can be difficult to assess whether the price paid for the index-linked bond is fair in relation to the value of the underlying components. In many cases, the built-in options are not traded in an open market, and the complexity of the products makes it very difficult to calculate their theoretical value.

The non-existence of a secondary market for index-linked bonds prevents the investor from obtaining a real indicative market price for the product purchased. An investor who buys a stock or a simple coupon bond may not necessarily have insight into all the mechanisms that influence the market price. However, the investor knows that the instrument is traded in a liquid market where the market participants have this insight. The market price is thus very likely to be a good reflection of the value of the asset. The purchaser of an index-linked bond has to take the provider's word that the sales price is the right price.

It could be argued that the investor can simply contact 4-5 different providers, compare the prices of the index-linked bonds, and then choose the cheapest offer. However, the low degree of standardisation of the index-linked bonds and their prospectuses, as well as the close link between the investor's bank and the provider of the index-linked bond, who are more often than not identical, make this approach unrealistic.

ISSUANCE DOCUMENTS

The three investment portfolios presented above have a common overall structure. They are all packages comprising a relatively secure product (the zero-coupon bond in portfolio 1, and the non-interest-bearing bank accounts in portfolios 2 and 3) and a high-risk investment (the option in portfolio 1, the equity investment in portfolio 2, and the lotto coupon in portfolio 3). The difference is that in portfolios 2 and 3 it is clearly evident how large a share of the invested sum is placed in, respectively, low-risk and high-risk assets, while this is not the case for portfolio 1. Here the two products are bundled, and in principle the investor can only see the aggregate price.

One way to increase transparency could be for the index-linked-bond prospectus to state how much of the issue price is related to, respectively, the bond and the option. This would allow investors to see "how much option" they are in fact buying. In recent years, one Danish provider has begun to include this calculation in the prospectuses for the products it offers. However, this has by no means been standardised across providers. It should be noted that this approach tells the investor what the provider has paid for the option, but not whether the price is fair.

To gain an impression of the value of the option in the structure, it is necessary to consider the characteristics of the underlying asset. The information material on index-linked bonds typically includes a graph of the historical development in the underlying asset. However, this description gives only little information to the investor in terms of the valuation of the related option. As such, the historical development in the asset price has no influence on the value of an option on the asset.

The decisive factor is the volatility of the asset price. The more volatile the asset, the higher the value of the option, all other things being equal. This is because the greater volatility increases the probability of the price of the underlying asset reaching a level where the option contributes a large payoff. One possibility might therefore be to state the historical volatility of the asset compared with the implied volatility on which the price of the purchased option is based. If the implied volatility is far higher than the historical volatility, the price of the option is too high.

Comparison of the implied and historical volatilities is difficult, however, when it comes to the very complex products issued in recent years. Here, the return on the bond is often linked to one or more baskets of underlying indices, so we are no longer talking about options on single underlying assets. In this case, the decisive factor is no longer the variation in the individual asset, but just as much the covariation between the assets.

INDEX-LINKED BONDS AS INVESTMENT OBJECTS

There are two approaches to assessing index-linked bonds as investment objects. One relates to the price the investor pays for the product compared to the value of the underlying components. Is the price fair? The other relates to the quality of the product in relation to the investor's expectations of the potential return of the index-linked bonds. Below, the value of the underlying components for a range of index-linked bonds is calculated. Then the actual returns on a number of index-linked bonds are analysed in order to assess whether the bonds in question have historically been sound investments.

Is the price fair?

On the basis of a selection of the simplest products, i.e. currency-indexed bonds linked to a single exchange rate, the theoretical price of the option can be calculated. The price of the index-linked bond less the theoretical price of the option gives an implied price for the zero-coupon bond. If the investment entails no extra costs for the investor,

the implied price of the zero-coupon bond will be the same as the price of an equivalent zero-coupon bond without an option. Any difference in price can be taken to be the implied premium on the theoretical value of the product paid by the investor for the index-linked bond.

Calculations based on 10 currency-indexed bonds show that the implied zero-coupon yield varies between -0.2 per cent p.a. and 1.8 per cent p.a.[1] There is thus some variation in the implied costs related to the individual index-linked bond. On average, the implied placement yield is 2.2 percentage points lower than the annual yield to maturity on a government bond with equivalent maturity. In other words, the investor pays a substantial premium – in excess of the theoretical price of the option – for access to the option in the index-linked bond.

A survey by Stoimenov and Wilkens (2005) of equity-linked bonds issued in the German market yields similar results. In addition, it is seen that the implied premium increases with the degree of complexity in the option bundled with the index-linked bond.

The historical return

Below, the historical return on this type of product is investigated. Since the products are classified as buy-and-hold instruments, the return at redemption is considered.

Index-linked bonds were not introduced until the late 1990s and are thus relatively new in the Danish investment universe. Due to the limited issuance volume in the early years, combined with a typical life of 2-5 years, it has only been possible to perform systematic analysis of the historical return on this type of investment within the last couple of years.

A review of stock-exchange releases, prospectuses and providers' websites has identified a total of 67 index-linked bonds listed on the Copenhagen Stock Exchange that have been redeemed.[2] The 67 bonds represent an aggregate nominal value of approximately kr. 18 billion. The average annual return weighted by the nominal value of the bonds has been 3.37 per cent. If the annual returns are also weighted by the maturities of the bonds, the average annual return is 2.47 per cent.[3] Chart 3 presents the distribution of the annual returns.

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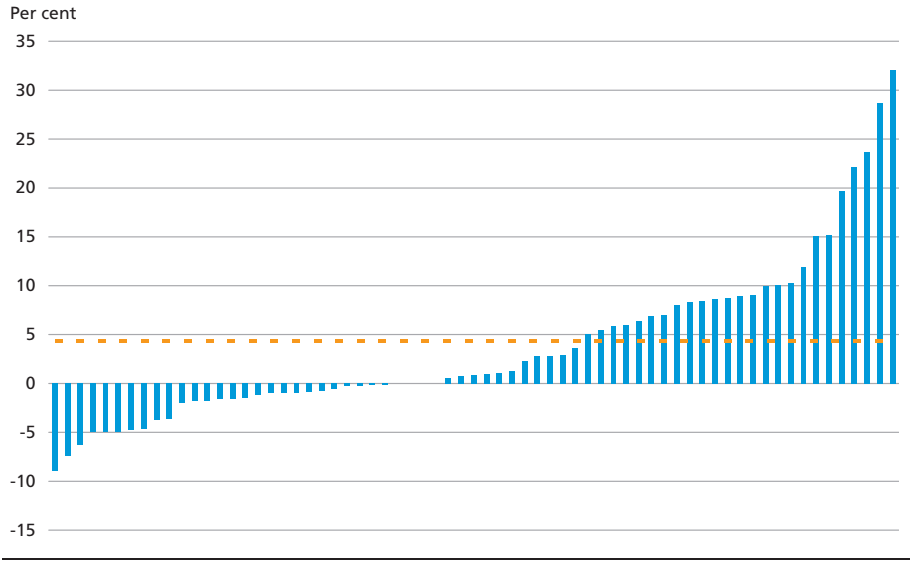
1 The implied zero-coupon bond yield is found by subtracting the theoretically calculated option value from the issue price for the index-linked bond. This gives the price of a theoretical zero-coupon bond. This can be compared with the guaranteed redemption price at maturity, interpreted as the value of the zero-coupon bond at maturity. On the basis of these values, the implied zero-coupon bond's placement yield is calculated.

2 With this approach, it cannot be guaranteed that the 67 index-linked bonds for which data has been found constitute the full population of bonds redeemed to date.

3 The index-linked bonds have different maturities. A few bonds may have given a return of 15 per cent p.a., but only for one year, while other bonds may have given returns equivalent to 5 per cent p.a. for 5 years. Since it cannot be guaranteed that the high return on the short-term investment can be repeated year after year, differences in maturity should be taken into account when calculating the return.

DISTRIBUTION OF HISTORICAL ANNUAL RETURNS ON INDEX-LINKED BONDS Chart 3



Note: The dashed line indicates the yield to maturity on a 2-year Danish government bond, beginning of May 2007.
Source: Various bond prospectuses, stock-exchange releases, providers' websites and own calculations.

Of the 67 bonds, 31 were redeemed with a zero or negative return. Looking at the excess return on the index-linked bonds in relation to government bonds with the same maturity, we find an average value-weighted annual excess return of 0.32 percentage point. The maturity-weighted excess return is 0.11 percentage point.

The historical excess return has thus been modest, particularly if a number of other factors are taken into account. Firstly, the credit risk on index-linked bonds is greater than on government bonds. Secondly, government bonds are far more liquid than index-linked bonds. Thirdly, a normally risk-averse investor is willing to pay a higher price for a secure return than for a very volatile return.

CONCLUDING REMARKS

Index-linked bonds give private investors access to an investment universe, the option market, that has not previously been so accessible, and in which direct investments often entail relatively high costs. Indexation of the bond payoff gives the investor access to a return profile that would otherwise be difficult to achieve. For example, inflation-indexed bonds offer investors protection against inflation.[1]

[1] This type of bond is not included in the analysis. Instead, it focuses on bonds with other types of indexation, which appear to be of a more speculative nature.

As with all other investments, a critical approach should be taken to the individual products offered. The basic return profile for the index-linked bonds discussed in this article could, in principle, cover a very wide range of investments – from a lotto coupon to a conservative investment comprising a bank deposit combined with a very small equity investment.

The high degree of complexity inherent in the index-linked bonds offered for sale makes it difficult to assess the exact properties underlying each product. This makes it hard to distinguish the lotto coupons from the sound investments.

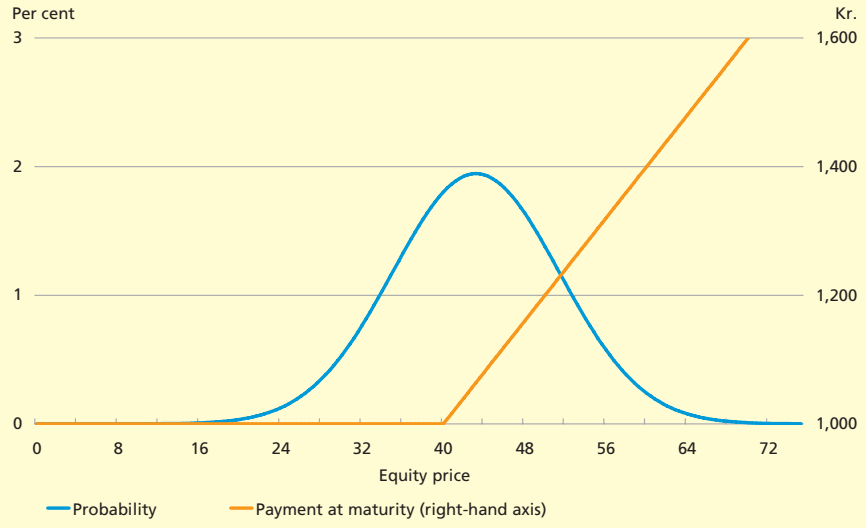
Calculations presented in this article show that the parties behind the index-linked bonds have historically made a good profit from the sale of these bonds. Investors, on the other hand, have incurred a risk that is higher than on investment in e.g. government bonds, without being rewarded with higher average returns.

PROBABILITY DISTRIBUTIONS AND PAYMENT PROFILES FOR INDEX-LINKED BONDS Box 3

An index-linked bond may be constructed with countless payment profiles and underlying assets. The fundamental properties of the bond can be investigated by considering one of the simplest structures, an equity-indexed bond linked to a single equity.

Assume a 2-year bond with a payment at maturity of kr. 1,000, plus a positive return equivalent to 80 per cent of any percentage increase in the underlying equity. The initial price of the equity is assumed to be kr. 40. If the price increases by 20 per cent, to kr. 48, the bond owner will receive kr. 1,000 + 0.8 * 0.2 * kr. 1,000 = kr. 1,160 at maturity. This is a zero-coupon bond with a plain vanilla option. At maturity of the bond, the structure can be illustrated as shown in Chart 4.

EQUITY-INDEXED BOND Chart 4



Note: It is assumed that the price of the equity follows a geometrical Brownian motion with a drift rate of 4 per cent p.a. and annual volatility of 14.5 per cent. For simplicity, it is assumed that no dividend is paid.

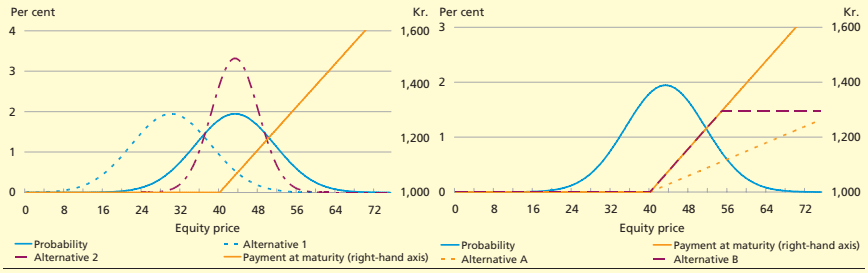
On comparison with a portfolio comprising a deposit in a non-interest-bearing bank account and a small equity investment, cf. portfolio 2 in Chart 2, it is seen that the index-linked bond gives a lower return at maturity if the price of the underlying stock is below 40 on the maturity date. On the other hand, a relatively higher return is achieved if the equity price increases. If the full amount of kr. 1,040 is invested in equities, an even higher return is achieved if the equity price rises, but the payment is lower than kr. 1,000 if the price falls. Individual preferences govern the choice of investment strategy.

The above illustration is based on a very simple index-linked bond. Even so, it can be difficult to understand the structure's exact probability distribution and return profile. For most private investors this type of structure will be impossible to price. The index-linked bonds are often linked to other asset classes than equities, and the built-in option, cf. Box 2, may have special characteristics that influence both the probability distribution and the future return. Chart 5 illustrates the possible consequences.

CONTINUED Box 3

The index-linked bond may be linked to scenarios where the probability of achieving a positive return on the strategy is in fact very small, as illustrated by alternative 1 in Chart 5 (left). If this is compared with the original scenario, indicated by the full blue line, it is seen that for alternative 1 the probability mass is much smaller in the area where the strategy gives a positive return. A bond with this probability distribution is worth less than the original structure. This could be the case if the selected scenario is driven by a speculative strategy rather than by financial rationales.

ALTERNATIVE PROBABILITY DISTRIBUTIONS AND PAYMENT PROFILES Chart 5



There may also be strategies where the variation in the future value of the underlying index is low. This is illustrated by alternative 2 in Chart 5 (left). This structure may e.g. be seen when the bond is linked to a basket of underlying assets. It is also the case when the return on the bond is determined by the average of a number of observations of the price of the underlying assets during the term of the bond, an Asian option, rather than just the price of the underlying asset when the bond matures. Again, this type of bond is worth less than the original bond, cf. the full line.

Chart 5 (right) illustrates how the return profile at maturity depends on the conditions for the index-linked bond. Alternative A shows the consequences of a change in the participation rate, i.e. the percentage of any increases in the underlying asset whereby the index-linked bond return is scaled. If the participation rate is changed from 80 to 30 per cent, the dashed yellow line is seen instead of the full yellow line. It takes greater increases in the value of the underlying asset to achieve a return on the index-linked bond equivalent to that in the original scenario. An upper limit to the final return on the index-linked bond may also be set, as illustrated by alternative B in the right-hand chart.

The various structures give an idea of the multitude of combinations of probability distribution and return profile on which an index-linked bond may be based. If an investor cannot identify the properties of the individual product, he may in principle just as well end up with an index-linked bond with a probability distribution corresponding to alternative 1 in Chart 5 (left), and a return profile as in alternative A in Chart 5 (right), as the product illustrated in Chart 4. The value of the index-linked bond illustrated in Chart 4 is clearly greater than the value of the alternative structure.

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The Stability and Growth Pact – Status 2007

Marianne C. Koch, International Relations

INTRODUCTION AND SUMMARY

The Stability and Growth Pact is at the heart of the EU's budgetary surveillance of the member states. The surveillance spans the short term in the excessive deficit procedure, the medium term in the medium-term objectives, and the long term in the long-term fiscal sustainability analyses. This article describes the most important developments and tendencies in the EU's budgetary surveillance in 2006, focusing on the experience so far with the Stability and Growth Pact after the 2005 reform.

The European economies made strong economic progress in 2006. This has influenced the EU member states' budgetary positions, which in most cases improved considerably in 2006. The strong economic growth enabled a number of member states that are subject to the excessive deficit procedure to reduce their deficits to below the 3-per-cent limit in 2006. For four of these member states, the procedure is expected to be abrogated in 2007. The number of member states subject to the excessive deficit procedure is thus likely to be reduced substantially during 2007.

In the medium term, the structural adjustment in relation to the medium-term objectives was insufficient in 2006, especially in view of the economic situation. The planned structural adjustments up to 2009 are on a par with the adjustment realised during the previous upswing at the end of the 1990s. However, this should be viewed in conjunction with the lower levels of budget deficits in the period 2006-09 when cyclical effects are taken into account. Since the adjustments are solely planned adjustments, the objective of consolidation in good times, and the reformed Stability and Growth Pact as such, will only be put to the test in the coming years.

In a long-term perspective, demographic changes will put considerable strain on the government finances of many EU member states. The European Commission's quantification of the long-term sustainability of government finances has increased focus on the need for budget consolidation and structural reform of the labour market, and of pension and healthcare systems.

GOVERNMENT FINANCES IN 2006

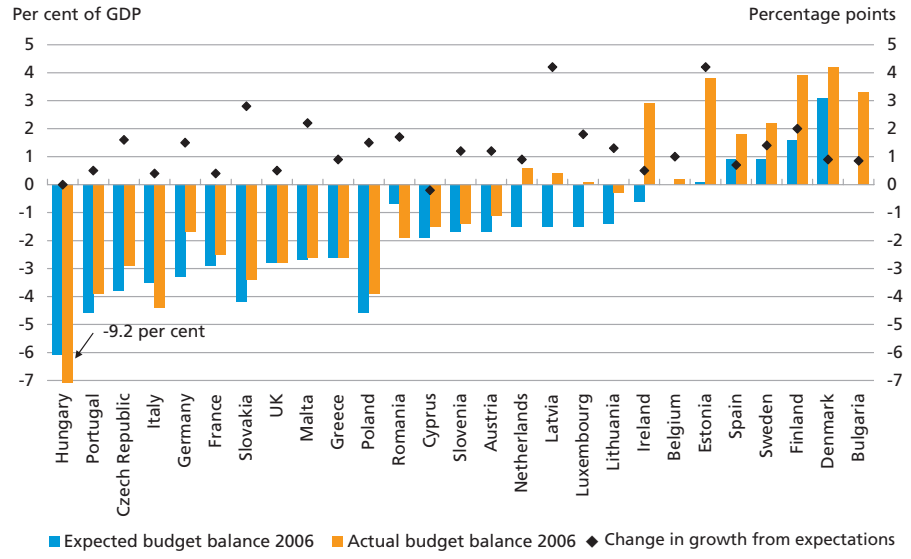
The cyclical development was positive in 2006, and the EU's GDP growth of 3.0 per cent was the highest for six years. The economic development impacted on the government budgets of the EU member states, which generally improved in 2006. Overall, the EU's budget deficit was thus reduced to 1.7 per cent of GDP in 2006, from 2.4 per cent in 2005, while the euro area's budget deficit decreased from 2.5 per cent in 2005 to 1.6 per cent in 2006.

Growth took a more favourable course in 2006 than was expected at the beginning of the year. As a result, most member states achieved a more positive budgetary development than expected when they presented their stability and convergence programmes at the beginning of 2006, cf. Chart 1. A total of 22 member states achieved more favourable budgetary developments in 2006 than expected at the beginning of the year. For these member states, the improvement can predominantly be attributed to higher revenue in view of larger output growth than expected.

Romania and Hungary are the only member states with an actual deterioration in their budgetary situations compared to the expected

BUDGET BALANCE AND CHANGE IN GROWTH IN RELATION TO EXPECTED GROWTH

Chart 1



Note: The expected budget balance in 2006 originates from the member states' expectations of 2006 in their updated stability and convergence programmes 2005/06. The change in relation to expected growth is actual less expected growth. Actual growth originates from the Commission's estimate in the autumn 2005 forecast. For Romania and Bulgaria, the expected budget balance and expected growth in 2006 originate from the estimates in their pre-accession programmes, December 2005.

Source: Stability and convergence programmes 2006/07, Eurostat, The Commission's autumn forecast, November 2005, and the pre-accession programmes of Bulgaria and Romania, December 2005.

level. The deterioration was strongest in Hungary, whose budget deficit increased by around 3 per cent of GDP to 9.2 per cent of GDP.[1]

Romania joined the EU on 1 January 2007 and in 2006, Romania's budget deficit was 1.9 per cent of GDP, and its government debt equivalent to 12.4 per cent of GDP. Romania's government finances thus initially comply with the Treaty and the Stability and Growth Pact.[2] This is also the case for the other new EU member state, Bulgaria, which in 2006 posted a budget surplus of 3.3 per cent of GDP and government debt of 22.8 per cent of GDP. Economic growth is very strong in both member states, although their level of prosperity is only around one third of the EU level. Catching up with the rest of the EU is therefore the primary medium-term objective of both member states.

The cyclical upswing in the EU is expected to continue unabated in 2007. The budget consolidation is expected to follow suit. In its spring forecast, the European Commission expects the budget deficit of the EU member states to decline further to 1.2 per cent of GDP in 2007, while the euro area's budget deficit is expected to be reduced to 1 per cent of GDP, cf. the Appendix Table.

THE EXCESSIVE DEFICIT PROCEDURE

The excessive deficit procedure is a key element of the Stability and Growth Pact, which is the framework for the budgetary surveillance of the EU member states. The Pact can be divided into a "corrective arm" and a "preventive arm". The corrective arm consists primarily of the excessive deficit procedure, while the preventive arm focuses on the member states' medium-term budget adjustments, cf. below. The central element of the excessive deficit procedure is that a member state's budget deficit may not exceed the Treaty-bound limit of 3 per cent of GDP. If this limit is exceeded, the excessive deficit procedure is initiated for the member state, and the EU's fiscal surveillance is intensified until the member state succeeds in reducing its budget deficit to below the 3-per-cent limit.[3]

In most of the ten member states that were subject to the excessive deficit procedure at the beginning of May, the upswing has resulted in lower budget deficits. A number of member states thus reduced their budget deficits to below the 3-per-cent limit in 2006, several of them

1 Italy's budget deficit in 2006 was also higher than expected at the beginning of the year, but the deterioration can be attributed to a number of one-off effects and does not reflect a real deterioration in the budgetary situation.

2 According to the European Commission's spring forecast from May 2007, Romania's budget deficit will exceed the 3-per-cent limit in 2007 and 2008.

3 For more details on the Stability and Growth Pact, see Borka Babic, The Stability and Growth Pact – Status 2006, Danmarks Nationalbank, *Monetary Review*, 2nd Quarter 2006.

STATUS FOR MEMBER STATES SUBJECT TO THE EXCESSIVE DEFICIT PROCEDURE, MAY 2007 Table 1

	Council decision to initiate procedure	Type of Council decision (Article in Treaty)	Budget balance 2006	Deadline for correction
Euro area member states				
Greece	2004	Notice (104.9)	-2.6	2006
Germany	2003	Notice (104.9)	-1.7	2007
Italy	2005	Recommendation (104.7)	-4.4	2007
Portugal	2005	Recommendation (104.7)	-3.9	2008
Non-euro area member states				
Malta	2004	Recommendation (104.7)	-2.6	2006
UK	2006	Recommendation (104.7)	-2.8	2006/07
Poland	2004	Recommendation (104.7)	-3.9	2007
Slovakia	2004	Recommendation (104.7)	-3.4	2007
Czech Republic	2004	Recommendation (104.7)	-2.9	2008
Hungary	2004	Recommendation (104.7)	-9.2	2009

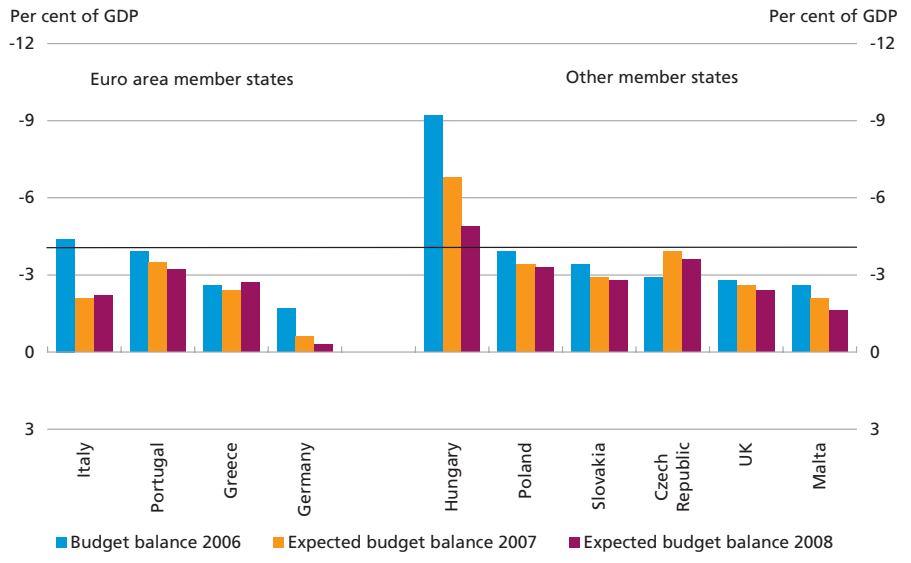
Note: The type of Council decision relates to the stage in the procedure for each member state in relation to articles 104.7, 104.8 and 104.9 of the Treaty. Under *(104.7)* the Council makes a *recommendation* to the member state to correct its deficit within a given deadline. Under *(104.8)* the Council has established that there has been *no effective action* in response to its recommendation to correct the budget deficit within the given deadline. Under *(104.9)* the Council *gives notice* to a member state to correct its deficit within a specified time limit. Only euro area member states can be given notice to correct their budget deficits, and if the Council decision is not observed, sanctions may be imposed on the member state. The UK's fiscal year runs from 1 April to 31 March.

earlier than expected. The number of member states subject to the excessive deficit procedure is expected to decline in the coming months. Only the budgetary positions of Hungary, Slovakia and Italy deteriorated in 2006. Since the increased budget deficits of both Slovakia and Italy can be attributed primarily to one-off effects, Hungary is the only member state in the group subject to the excessive deficit procedure whose government finances actually deteriorated in 2006.

Budget deficits reduced to below 3 per cent in several member states

A consequence of the surprisingly high growth in 2006 is that a number of member states have reduced their budget deficits to below the 3-per-cent limit. For the two member states, Cyprus and France, that had a deadline for correction of their budget deficits in 2005, the procedure was abrogated in respectively July 2006 and January 2007. A further five member states reduced their budget deficits to below the 3-per-cent limit in 2006. The combination of the current favourable cyclical position and several member states' deadline for correction in 2006/2007 means that the number of member states subject to the excessive deficit procedure can already be considerably reduced in 2007. This tendency is expected to continue in the coming years.

EXPECTED BUDGET ADJUSTMENTS IN THE PERIOD 2006-09 Chart 2



Note: The horizontal line is the 3-per-cent limit. In view of the expiry of the transition period for inclusion of funded pension schemes at the end of April, these shares are now included in all statements of budget deficits. The UK's fiscal year runs from 1 April to 31 March.
Source: The Commission's spring forecast 2007.

Cyprus reduced its budget deficit to 2.3 per cent of GDP in 2005, from 6.3 per cent of GDP in 2003. Since the measures implemented by Cyprus were predominantly of a permanent nature, the Ecofin Council in July 2006 decided to abrogate the excessive deficit procedure for Cyprus.[1] For *France*, stringent interpretation of the rules of the Stability and Growth Pact delayed abrogation, even though France reduced its budget deficit to 2.9 per cent of GDP in 2005.[2] To some extent the consolidation could be attributed to one-off measures (0.6 per cent of GDP), and in its spring 2006 forecast the Commission expected the deficit to increase to 3.0 per cent in 2006. As a result, the abrogation of the excessive deficit procedure had to await clear signs of a sustainable reduction of the deficit. Since the Commission's autumn forecast from November 2006 showed a downward trend for the budget deficit up to 2008, in January 2007 France was removed from the excessive deficit procedure. The example of France confirms the stringent interpretation of the Stability and Growth Pact in that the excessive deficit procedure was applied for

[1] In 2005, the one-off effects amounted to 1.3 per cent of GDP, but the Commission in its spring forecast from May 2006 expected the budget deficit to decrease further in 2006 and 2007. The budget deficit was thus found to be reduced to below the 3-per-cent limit in a credible and sustainable manner.
[2] The budget deficit in 2005 was subsequently revised to 3 per cent of GDP.

an extended period to a large member state with a prolonged and relatively difficult course[1] in the procedure.

For a number of other member states the procedure is expected to be abrogated in the near term. *Greece*, *Malta* and the *UK*, that are subject to deadlines for correction of the budget deficit in 2006 and 2006/07, have reduced their budget deficits to below the 3-per-cent limit in 2006.

Germany and the Czech Republic are subject to deadlines for correction of their budget deficits in respectively 2007 and 2008. In 2006, both member states also reduced their budget deficits to below the 3-per-cent limit. Expectations of *Germany's* budget deficit in 2006 have been subject to ongoing downward adjustment. The most recent data showed a budget deficit of 1.7 per cent in 2006, which is well below the 3-per-cent limit. After a rather turbulent process, which started in 2003, the procedure is now already likely to be abrogated for Germany in 2007, which is one year ahead of the deadline. The abrogation of the excessive deficit procedure for first France, and in the near future, Germany is important to the credibility of the reformed Stability and Growth Pact. With a budget deficit of 2.9 per cent in 2006, the *Czech Republic* also reduced its budget deficit to below 3 per cent of GDP. The European Commission expects the Czech Republic's budget deficit to exceed the 3-per-cent limit again in 2007, however.

A record-high budget deficit in Hungary

In 2006, the strong deterioration in Hungary's budget balance was a notable exception from the positive budgetary course in the other EU member states. Hungary has been subject to the excessive deficit procedure since July 2004, i.e. immediately after it joined the EU. Nevertheless, the budgetary situation has deteriorated strongly in recent years, and Hungary's budget deficit of 9.2 per cent of GDP in 2006 was clearly the highest in the EU. Hungary had already received two recommendations to reduce its budget deficit by 2008,[2] but during 2006 Hungary's attitude changed. Previously, Hungary in practice ignored the recommendations of the Ecofin Council, but in 2006, after receiving the third Council recommendation to correct its deficit, Hungary made a commitment to comply with the EU requirements.

Hungary's updated convergence programme from October 2006 contained an ambitious consolidation plan, including structural adjustment

[1] Reference is made to the Ecofin Council's decision to hold in abeyance the excessive deficit procedure for France and Germany, and to the Commission's legal action brought before the European Court of Justice in 2004, cf. Thomas Haugaard Jensen and Jens Anton Kjærgaard Larsen, The Stability and Growth Pact – Status 2005, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2005.

[2] Only euro area member states can be given notice to reduce their budget deficits by the Ecofin Council, and ultimately be subject to sanctions. For non-euro area member states, the Council can only repeat its recommendations.

measures equivalent to almost 7 per cent of GDP in the period from 2006 to 2009. Hungary already initiated its consolidation process in the summer of 2006 with a reform package aimed at reducing the budget deficit by the equivalent of 1.5 per cent of GDP in 2006, and with considerable savings into 2007. Furthermore, an announced tax package including tax cuts was postponed, and a number of taxes, including VAT and corporation tax, were raised instead, while the basis for personal taxation was expanded.

Other member states subject to the excessive deficit procedure

Besides Hungary, only four other member states subject to the excessive deficit procedure posted budget deficits above the 3-per-cent limit in 2006. For Italy, Poland and Slovakia, the deadline for correction of their budget deficits is 2007, while Portugal's deadline is 2008. So far, the consolidation measures of Italy and Slovakia have been found adequate, and in its spring forecast the Commission expects the two member states' budget deficits to fall below the 3-per-cent limit in 2007. On the other hand, *Poland's* measures have been found to be insufficient to reduce the budget deficit.[1] Poland's budget deficit amounted to 3.9 per cent of GDP in 2006. In 2007, the deficit is expected to remain above the 3-per-cent limit, at 3.4 per cent of GDP. However, Poland expects to meet the conditions for the Commission's application of a special rule on the compilation of costs in connection with pension reforms.[2] In 2007, the pension share will amount to 1.2 per cent of GDP, but the Commission finds that it is too soon to determine whether Poland meets the conditions for incorporation of this in the assessment of the budget deficit. In the spring forecast from May, the Commission expects Poland's budget deficit to exceed 3 per cent of GDP also in 2008.

OBSERVANCE OF THE MEDIUM-TERM OBJECTIVES

The more long-term prevention of high budget deficits is at the core of the preventive arm of the Stability and Growth Pact. According to the preventive elements, EU member states should pursue a structural balance close to balance or in surplus in the medium term. The structural balance is the budget deficit excluding one-off and cyclical effects. The objective of the preventive arm is to help the member states to avoid

[1] Right up to the expiry on 1 April 2007 of Eurostat's transition period for inclusion of funded pensions, Poland included funded pensions in its compilation of the budget deficit. This has a positive effect on the budget balance. Hungary and Slovakia also relied on the transition provisions, but as from the autumn of 2006 they have ceased to include deficit-reducing funded pensions.

[2] According to this rule, over a period of five years the Commission and the Council should consider, with linearly diminishing weight, the net costs of special pension reforms in connection with abrogation of the excessive deficit procedure.

exceeding the 3-per-cent limit. The member states thus have structural medium-term objectives for their budgets.

The 2005 reform of the Stability and Growth Pact[1] introduced differentiation of these medium-term objectives, which are now determined by the individual member states on the basis of the member state's government debt and potential growth.[2]

More stringent rules apply to euro area and ERM II member states. Such member states with low debt or high potential growth may have a structural medium-term budget-deficit objective of up to 1 per cent of GDP, while member states with high debt or low potential growth must still pursue the objective of balance or surplus in the medium term. Furthermore, according to the preventive arm of the Pact, member states that have not yet achieved their medium-term objectives must make annual structural adjustments – for euro area and ERM II member states equivalent to at least 0.5 percentage points. More extensive structural adjustment is furthermore expected in an upswing ("good times"). In addition, the Pact stipulates that the member states must avoid conducting procyclical policies, i.e. expansionary fiscal policy in periods of high growth.

The key issues in relation to the preventive arm of the Stability and Growth Pact are thus whether the member states observe their individual medium-term objectives, and whether they take adequate structural adjustment measures in the event of non-observance of their medium-term objectives.

Medium-term objectives – determination and observance

Differentiation of medium-term objectives was a key element of the reform of the preventive arm of the Stability and Growth Pact. When member states determined their individual medium-term objectives for the first time in their updated stability and convergence programmes 2005/06, the medium-term objectives were set in accordance with the principles of the Pact. According to the Commission, in the determination of the medium-term objectives there was a tendency for the level of debt to be given relatively higher weight than the potential growth.[3]

In the latest update, most member states held their medium-term objectives unchanged. Only Hungary and Finland made changes, and to more ambitious medium-term objectives. In 2005, eight member states

[1] Cf. Thomas Haugaard Jensen and Jens Anton Kjærgaard Larsen, The Stability and Growth Pact – Status 2005, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2005.

[2] However, the MTO must at least be more ambitious than the minimum benchmark. The latter is the level of the structural balance that ensures a safety margin sufficient to avoid exceeding the 3-per-cent limit.

[3] A few member states – Denmark, Finland and Sweden – determined more ambitious medium-term objectives than prescribed by the Stability and Growth Pact.

already observed their structural balance objectives, and this number was unchanged in 2006. During the programme period, 18 member states plan to observe their medium-term objectives, but the Commission points to some uncertainty in the forecasts towards the end of the programme period for a number of member states.

Structural adjustment in "good times"

In 2006, a number of member states failed to observe their medium-term objectives, and are thus subject to the structural adjustment requirement. In view of the favourable economic development in 2006 for most EU member states, 2006 was an opportunity to make structural improvements to government finances. Overall, the Commission found the structural adjustment measures in 2006 to be insufficient, and not in compliance with the required adjustment in "good times".

To achieve more specific conclusions regarding the member states' compliance with the structural adjustment requirement, the EU member states are divided into three groups: member states subject to the excessive deficit procedure; other member states not observing their medium-term objectives; and member states that observed their medium-term objectives in 2006. In the updated stability and convergence programmes 2006/07, the three country groups are on average far from achieving the adjustment of 0.5 percentage points in 2006 required of most member states, cf. Chart 3.

In 2006, the *member states subject to the excessive deficit procedure*[1] implemented moderate structural adjustment measures, but as from 2007 on average plan structural improvements exceeding 0.5 percentage points. However, the aggregate structural adjustment by this group is strongly influenced by the deterioration in Hungary's structural balance in 2006, while Hungary's planned ambitious consolidation measures from 2007 have a positive impact on the group.

The *other member states not observing their medium-term objectives* are primarily euro area and ERM II member states.[2] Deterioration in the structural budget balance by an average of 0.5 per cent of GDP in 2006 is therefore far from compliance with the rules of the Pact. Cyprus and France were the only member states in the group to have undertaken positive structural adjustment, while especially Luxembourg and Latvia, along with Lithuania and Austria, had the opposite effect on the group.

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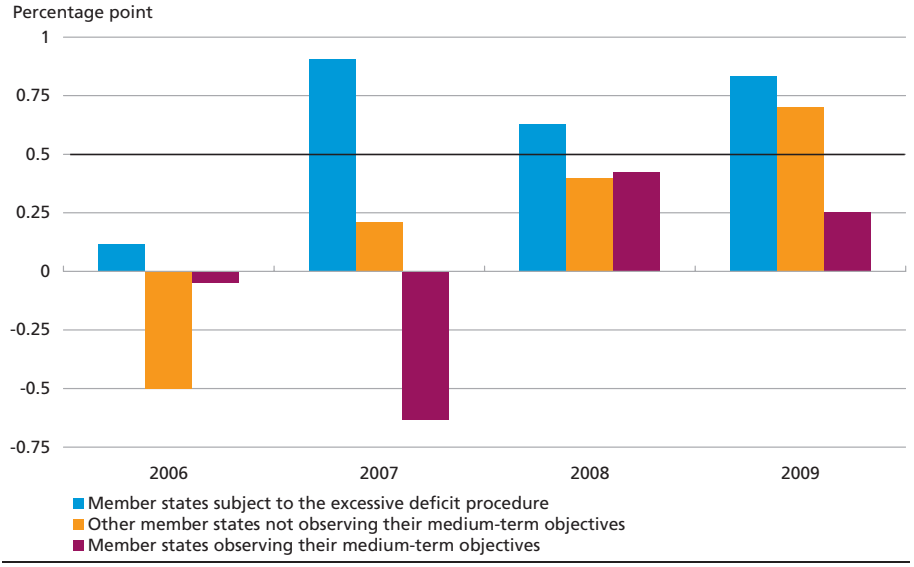
1 In principle, the requirement of minimum structural adjustment also applies to the member states subject to the excessive deficit procedure as this is included in the recommendations of the Ecofin Council.

2 Only Romania is neither a euro area nor an ERM II member state.

THE MEMBER STATES' PLANNED STRUCTURAL ADJUSTMENT Chart 3



Note: The member states subject to the excessive deficit procedure are: Greece, Italy, Malta, Poland, Portugal, Slovakia, the UK, the Czech Republic, Germany and Hungary. Other member states not observing their medium-term objectives are: Belgium, Cyprus, France, Latvia, Lithuania, Luxembourg, Romania, Slovenia and Austria. Member states that observe their medium-term objectives are: Bulgaria, Denmark, Estonia, Finland, the Netherlands, Ireland, Spain and Sweden.
Source: Stability and convergence programmes 2006/07.

However, the member states plan to implement some adjustment measures in 2007.

The *member states that observe their medium-term objectives* plan a considerable deterioration in their structural budget balance, especially in 2007. A number of these member states, including Bulgaria, Estonia, the Netherlands, Ireland and Sweden, are thus at risk of conducting procyclical policies as a result of their easing of fiscal policy during an upswing.

All groups will step up their structural adjustment, but full compliance with the minimum requirements of the Stability and Growth Pact by all of the groups is not expected until 2009. Acknowledging that, in the light of the favourable economic development, the planned measures could be more ambitious, the euro area member states have, via the Eurogroup, committed to a higher degree of compliance with the structural adjustment requirements in the coming years. At the same time, the euro area member states that have achieved their medium-term objectives have committed to avoiding macroeconomic imbalances. This should be viewed as an obligation to maintain sound government finances and avoid procyclical measures.

Experience with the reformed Pact – status

One intention of the reform of the Stability and Growth Pact was to increase focus on the preventive arm. The limited structural progress in 2006 does not necessarily mean that the reform has failed to function as intended. The economic outlook has improved throughout the year, which has impeded the advance planning of further consolidation measures. For example, in the autumn of 2005 the Commission assessed that, in view of weak economic growth, the EU member states would only be able to reduce their budget deficits a little in 2006.

In the period 1998-2001, with average growth of 2.9 per cent, the overall cyclically-adjusted budget deficit improved by 0.3 per cent of GDP. In the period 2006-09, with an average expected growth rate of around 2.6 per cent, the target adjustment is 0.24 per cent of GDP.[1] The budgetary adjustments in the programme period are thus at the level of the adjustment during the previous upswing, but the level of the member states' corrected budget deficits in 2006 and over the programme period is considerably lower. Since the adjustments in 2006-09 are solely planned adjustments, the objective of consolidation in good times, and the reformed Stability and Growth Pact, will only be put to the test in coming years, when the favourable economic trends are expected to continue. The importance of the reformed Stability and Growth Pact should therefore not be disregarded on the basis of the relatively limited adjustment progress in 2006.

LONG-TERM FISCAL SUSTAINABILITY

The EU's fiscal surveillance also includes long-term assessment of the member states' economic policies. The EU member states face a considerable challenge in coming years, when changing demographic structures will put a strain on government finances, particularly in the pension and healthcare areas. The Commission's October 2006 report on fiscal sustainability in the EU member states estimated an increase in expenditure related to the ageing population by around 4 per cent of GDP up to 2050. According to the Commission, the budgetary development in 2006 did not change this overall conclusion.[2]

The surveillance of long-term fiscal sustainability is based on projections of the member states' age-related government expenditure and the fiscal-policy strategies presented in the stability and convergence programmes. Fiscal sustainability is traditionally assessed over an infinite

1 The basis for comparison is EU15 excluding Austria and Luxembourg.
2 The projections are based on the member states' structural balances in 2006, as stated in the stability and convergence programmes 2006/07.

horizon.[1] However, this restricts the outlook for political purposes, where a finite horizon is more relevant, particularly in relation to the formulation of political recommendations. For sustainability analysis purposes, the EU has thus calculated a sustainability indicator based on compliance with the limit for government debt of 60 per cent of GDP by 2050.[2]

The member states' readiness to address the increased strain on government finances in the coming years varies considerably, as reflected in the Commission's classification of the member states into low-, medium- and high-risk groups, cf. Chart 4.

For just under half of the EU member states,[3] significant adjustment by more than 2 per cent of GDP is required for compliance with the 60-per-cent limit in 2050. The situation is particularly serious in Hungary, but Portugal is also regarded as a member state with considerable sustainability difficulties. In both member states, government debt exceeding the 60-per-cent limit and a high budget deficit are straining current government finances. The age-related expenditure is also considerably above the EU average. In 2006, both Hungary and Portugal took steps to reduce the long-term costs. While Hungary's pension measures are of an introductory nature, the Commission finds that in the coming decades Portugal's pension reform will significantly reduce the age-related cost burden. Consequently, less adjustment is required in Portugal, but both member states still face substantial challenges, cf. Chart 4.

While the classification of Hungary and to a certain extent Portugal as high-risk member states is attributable both to their unfavourable initial budgetary position and the rising age-related expenditure, the budgetary outlook for Cyprus, Slovenia and the Czech Republic is characterised by high future age-related expenditure. Age-related expenditure in Luxembourg is also expected to increase considerably in the coming years. However, due to low government debt and large savings resources in the social security system, corresponding to 25 per cent of GDP, Luxembourg is to a certain extent prepared for the demographic changes. Luxembourg is therefore classified as a medium-risk member state in terms of fiscal sustainability.

The Nordic countries, together with Estonia, on the other hand, are characterised by sound government finances and are classified by the

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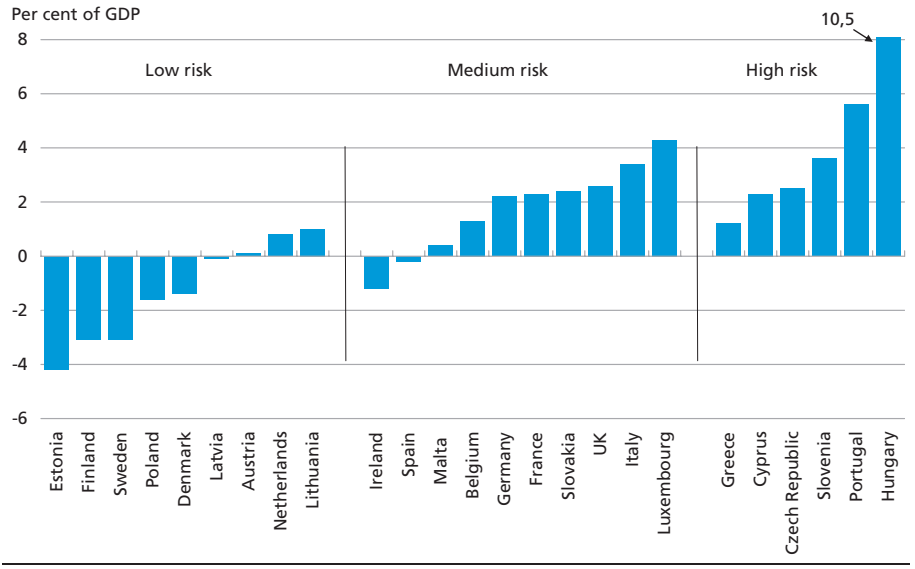
1 Government finances are traditionally considered to be sustainable if the current debt and the discounted value of future expenditure are covered by the discounted value of all future revenue.

2 The indicator of sustainability in relation to compliance with the 60-per-cent limit by 2050 is called the S1 indicator, while the S2 indicator is the measure of a member state's compliance with the intertemporal budget restriction. The S2 indicator is a more stringent measure of sustainability, due to its infinite horizon.

3 This section considers EU25 since there are no projections of long-term age-related costs for Bulgaria and Romania.

SUSTAINABILITY GAP AND CLASSIFICATION BY RISK, BEGINNING OF 2007 Chart 4



Note: In this Chart, sustainability is measured by the S1 indicator, which measures the extent of budget adjustment that would enable the member state to observe the 60-per-cent limit for government debt by 2050. A positive sustainability gap indicates that the current policies are not viable in the long term. As regards Cyprus and especially Greece, the Commission finds that the projections underestimate the actual conditions. The data for the Czech Republic and Austria is based on 2005. There is no available data on long-term sustainability for Bulgaria and Romania.

Source: The Commission's 2006/07 update of the calculations in the report "The long-term sustainability of public finances in the European Union", European Commission, October 2006.

Commission as low-risk member states in terms of fiscal sustainability. Despite its rather unfavourable starting position, Poland is classified as a low-risk member state, because the Commission expects Poland's age-related expenditure to decline up to 2050 due to extensive pension reforms.

The remaining member states face relatively moderate sustainability problems, in most cases related to the combination of a less favourable starting position and a certain age-related strain on government finances in the longer term.

THE EUROPEAN COMMISSION'S SPRING FORECAST OF GOVERNMENT BUDGET DEFICIT AND GOVERNMENT DEBT IN THE EU MEMBER STATES 2006-08

Appendix Table 1

	BUDGET BALANCE			GOVERNMENT DEBT		
Per cent of GDP	2006	2007	2008	2006	2007	2008
Euro area member states						
Belgium	0.2	-0.1	-0.2	89.1	85.6	82.6
Finland	3.9	3.7	3.6	39.1	37.0	35.2
France	-2.5	-2.4	-1.9	63.9	62.9	61.9
Greece	-2.6	-2.4	-2.7	104.6	100.9	97.6
Netherlands	0.6	-0.7	0.0	48.7	47.7	45.9
Ireland	2.9	1.5	1.0	24.9	23.0	21.7
Italy	-4.4	-2.1	-2.2	106.8	105.0	103.1
Luxembourg	0.1	0.4	0.6	6.8	6.7	6.0
Portugal	-3.9	-3.5	-3.2	64.7	65.4	65.8
Slovenia	-1.4	-1.5	-1.5	27.8	27.5	27.2
Spain	1.8	1.4	1.2	39.9	37.0	34.6
Germany	-1.7	-0.6	-0.3	67.9	65.4	63.6
Austria	-1.1	-0.9	-0.8	62.2	60.6	59.2
Euro(13)	-1.6	-1.0	-0.8	69.0	66.9	65.0
Other member states						
Bulgaria	3.3	2.0	2.0	22.8	20.9	19.0
Cyprus	-1.5	-1.4	-1.4	65.3	61.5	54.8
Denmark	4.2	3.7	3.6	30.2	25.0	20.0
Estonia	3.8	3.7	3.5	4.1	2.7	2.3
Latvia	0.4	0.2	0.1	10.0	8.0	6.7
Lithuania	-0.3	-0.4	-1.0	18.2	18.6	19.9
Malta	-2.6	-2.1	-1.6	66.5	65.9	64.3
Poland	-3.9	-3.4	-3.3	47.8	48.4	49.1
Romania	-1.9	-3.2	-3.2	12.4	12.8	13.1
Slovakia	-3.4	-2.9	-2.8	30.7	29.7	29.4
UK	-2.8	-2.6	-2.4	43.5	44.0	44.5
Sweden	2.2	2.2	2.4	46.9	42.1	37.7
Czech Republic	-2.9	-3.9	-3.6	30.4	30.6	30.9
Hungary	-9.2	-6.8	-4.9	66.0	67.1	68.1
EU(27)	-1.7	-1.2	-1.0	61.7	59.9	58.3

Source: The European Commission's spring forecast, May 2007.

The Future Financing of the IMF

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INTRODUCTION AND SUMMARY

The administration of international organisations is mainly financed by either the interest-rate margin on lending (e.g. the International Monetary Fund, IMF) or by annual member contributions (e.g. the UN and the OECD). The strong decline in IMF lending during the last two years has eroded the IMF's income base. As a result, the IMF is investigating new financing models, not least to finance the surveillance that constitutes the IMF's largest expenditure item and contributes to macroeconomic and financial stability and crisis prevention. In the face of globalisation, the focus is currently on strengthening this area.

An external committee chaired by Andrew Crockett was established to prepare a proposal, and in January 2007 the Committee presented its proposal for a new IMF financing model whereby the IMF's three core activities, i.e. surveillance, lending and technical assistance, each have their own financing. The key new sources of income in the proposal are the return on the investment of more resources, including investment of a part of the member countries' quota resources, and investment of the proceeds from the sale of a part of the IMF's gold. The Committee's mandate did not include an assessment of opportunities for spending restraints in the IMF's administration budget, but measures to curb the administration costs are planned for the coming years.

This article explains the new situation for the IMF's finances, followed by a presentation of and comments on the proposal of the Crockett Committee. The proposal's implications for Danmarks Nationalbank, as well as the further process, are also described. The Nordic-Baltic constituency – of which Denmark is part – regards the proposed financing model as a sound basis for the further work to ensure a sustainable income model for the IMF. However, it may be difficult to muster the required broad majority in favour of the new sources of income, even though they are less political in nature than the collection of annual contributions from the member countries. Furthermore, in view of the IMF's substantial reserves, not all member countries are convinced of the need for new sources of income. The process is therefore expected to be protracted.

THE IMF'S NEW FINANCIAL SITUATION

The IMF's lending has decreased considerably over the last two years to the lowest level since the beginning of the 1970s. One reason is the favourable global economic development in recent years, which has helped large borrowers to repay their IMF loans, and contributed to avoiding new crises. The credit facilities are now concentrated on a few countries – not least Turkey, which at the end of 2006 accounted for more than 70 per cent of the IMF's total credit outstanding under the general borrowing programmes (including both current programmes and loans that are being repaid). The IMF's general borrowing programmes now cover only seven countries (excluding concessional lending to low-income countries).[1]

IMF lending is driven by credit to member countries with balance-of-payments problems. In the *credit intermediation* process, selected member countries make currency available to the IMF for lending. If lending rises, the IMF draws on these creditors, including Denmark.[2] As a result, their contributions, or reserve positions with the IMF, are increased. Similarly, their reserve positions are reduced if lending decreases. The correlation is shown in Chart 1, where it is seen that Denmark's reserve position has been reduced in step with the decline in IMF lending.[3]

So far, lending has been the key basis for the IMF's income and accumulation of reserves. The lending rate (rate of charge) has thus ultimately been fixed residually in order to meet the targets for income and accumulation of reserves. However, the creditors have also contributed, since part of the reserve position has not been remunerated, and deductions from the SDR interest rate on the interest-bearing part of the reserve position have been made[4], cf. Box 1 in Appendix 1. Countries that are neither borrowers nor creditors have not contributed to financing.[5]

In the light of the strong decline in lending, the relation between income and lending is not sustainable.[6] The rate of charge would thus have to be so high that IMF loans would not be attractive, despite their

1 Unless otherwise stated, in this article lending refers to general lending excluding concessional lending to low-income countries since in principle these loans are financed separately.

2 This takes place via the Financial Transactions Plan that includes the IMF's expected drawings on the currently 48 countries accounting for 80 per cent of the total member subscriptions (quotas). Other countries with a positive reserve position in principle also contribute to this credit intermediation and can therefore also be classified as creditors. In March 2007, approximately 40 countries outside the Financial Transactions Plan had a positive reserve position exceeding 5 per cent of their quotas. Since these countries do not participate in the Financial Transactions Plan, however, they will not be asked to contribute further resources, so they are not included in the calculation of the resources available to the IMF for re-lending.

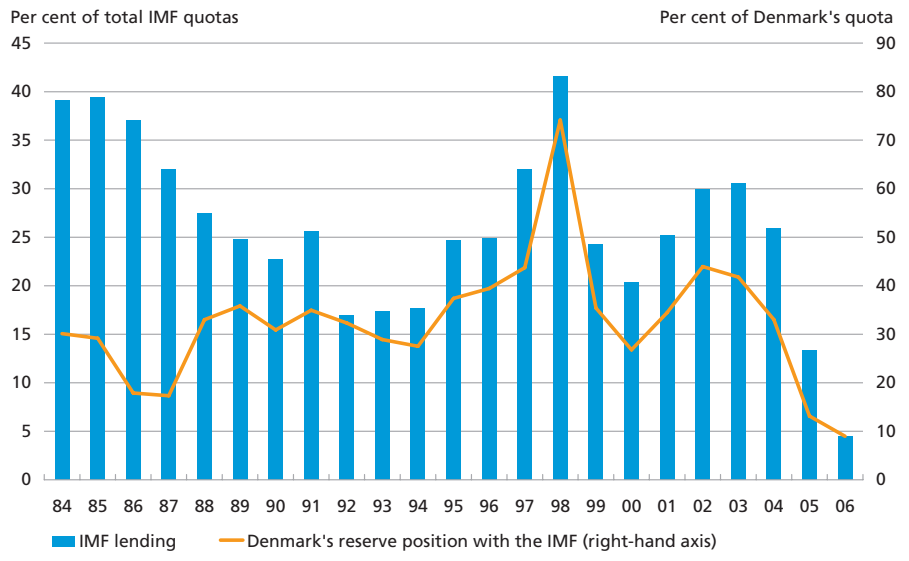
3 The relations between the reserve position and lending and the rate of remuneration, as well as Danmarks Nationalbank's accounts with the IMF, are described in more detail in Appendix 1.

4 The SDR interest rate is a weighted average of money-market interest rates in the USA, Japan, the euro area and the UK, and was 4.1 per cent at end-2006.

5 This not only applies to low-income countries, but also to some medium-income countries.

6 This relation did not exist at the beginning of the 1970s, when lending was equivalently low and the operational budget also showed a deficit.

IMF LENDING AND DENMARK'S RESERVE POSITION — Chart 1



Note: Lending excluding concessional lending to low-income countries, which is financed separately via other IMF activities.
A member country's quota is its member contribution determined on the basis of the country's calculated relative weight in the world economy. The IMF's current approach is to ensure equal distribution of reserve positions by drawing on selected creditors. Before 1990, special importance was attached to these countries' balance-of-payments positions and international liquidity. As a result, the reserve positions of some countries deviated considerably from the average.
Source: IMF and own calculations.

other advantages besides an interest rate below the market rate, including the economic-policy discipline that is a precondition for an IMF loan, and which is vitally important to any private credit providers.

In the spring of 2006, the IMF's Executive Board decided to temporarily freeze the element of the rate of charge that would otherwise be determined residually, instead drawing on the IMF's reserves if required. The IMF's reserves have been accumulated to safeguard the IMF's credit facil-

IMF'S EXPECTED INCOME AND EXPENDITURE — Table 1

SDR million	2007	2008	2009	2010
Income	541	511	490	421
Net income from interest and charges, etc.[1]	342	228	204	133
Investment income	199	283	286	288
Expenditure	649	657	667	686
– of which administrative costs[2]	609	615	625	640
Surplus/deficit	-108	-146	-177	-265

Note: 1 SDR = 1.5 dollars at end-2006. IMF's fiscal year, i.e. 1 May 2006 - 30 April 2007, etc.
Source: IMF (April 2007).
[1] Including interest expenditure saved on the non-interest-bearing element of the creditors' reserve position.
[2] At end-2005, the IMF had almost 2,700 employees and almost 450 contractual employees, cf. IMF Annual Report (2006).

ities and have increased considerably in recent years to the current level of approximately SDR 6 billion. The reserves are thus now sufficient to cover a certain deficit on the IMF's administrative budget for a considerable number of years to come. Furthermore, an Investment Account was established in order to achieve a higher rate of return on the reserves. On the expenditure side, the IMF's budget includes a real IMF expenditure reduction by 2 per cent per annum for the fiscal years 2008-10. An increasing deficit is expected in the coming years, cf. Table 1.

THE CROCKETT COMMITTEE'S PROPOSAL FOR A NEW FINANCING MODEL

In January 2007, a report was published by the external "Committee of Eminent Persons" established in May 2006 to present proposals to ensure a sustainable income model for the IMF. The Committee consisted of Chairman Andrew Crockett, President of JPMorgan Chase International, Mohamed A. El-Erian, President and CEO of Harvard Management Company, and a wide range of current and former central-bank governors[1].

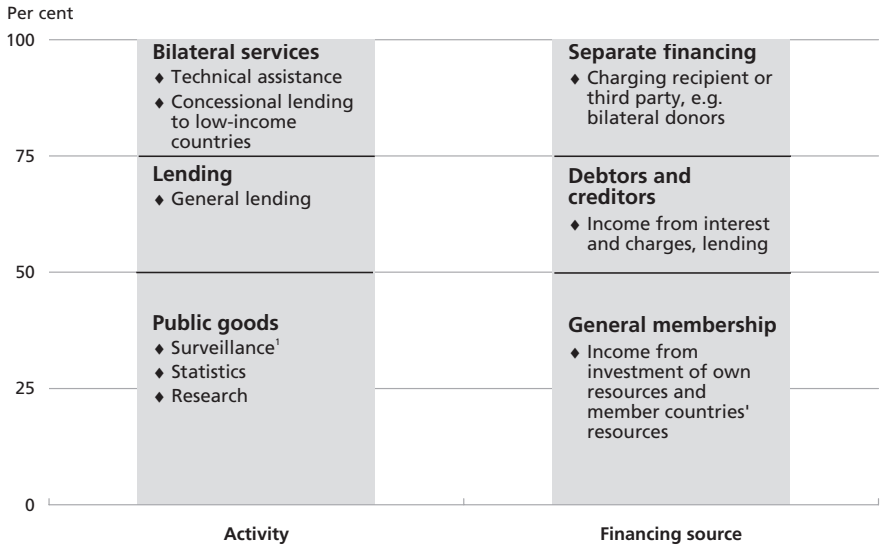
The Crockett Committee proposes new sources of income under a new IMF financing model, with separate financing of the IMF's three core activities. The provision of public goods should thus be financed by the member countries in general, while lending should still be financed by the credit intermediation margin on lending. Other bilateral services – e.g. technical assistance (IMF expert advice) – should be financed by the recipients and/or by bilateral donors, cf. Chart 2.

The Committee is not in favour of mechanical application of the framework, as the division of the activities and sources is more complicated in practice. For example, the ongoing macroeconomic surveillance (a public good) gives an input of information in the preparation of borrowing programmes, and the provision of technical assistance (a bilateral service) may be required for a country to be able to implement some of the measures set out in a borrowing programme. However, the Committee finds this delineation important to the clarification of the level of income needed, and to establish who should pay for the service.

In addition to the new sources of financing, a dividend policy is proposed, to be applied if the income proves to exceed the expenditures and need for accumulation of reserves. It is also emphasised that the income and expenditure sides should not be considered separately, but

[1] Alan Greenspan, the USA, Tito Mboweni, South Africa, Guillermo Ortíz, Mexico, Hamad Al-Sayari, Saudi Arabia, Jean-Claude Trichet, the euro area, and Zhou Xiaochuan, China.

THE CROCKETT COMMITTEE'S PROPOSAL FOR A NEW IMF FINANCING MODEL Chart 2



Note: The figures on the left indicate the approximate breakdown of expenditure by category.
Source: Committee of Eminent Persons (2007).
[1] Both macroeconomic and financial surveillance. The Committee thus classifies the IMF's assessment of the member countries' compliance with international standards and the voluntary review of a country's financial sector under the Financial Sector Assessment Program (FSAP) as public goods.

that an assessment of the level of expenditures and the potential for spending restraint in the IMF's administrative budget is beyond the Committee's mandate. The proposed financing sources are described in more detail below.

Financing of lending

The Committee proposes that the current source of financing the costs of general lending is kept unchanged. The lending rate (rate of charge) must be set to cover the costs of administration and creditor remuneration, as well as the necessary accumulation of reserves. However, it should no longer be used to finance other IMF activities. The rate of charge should be set at a level to prevent sustained use of the IMF's resources when it is possible to borrow on market terms, but must be held within a reasonable band, subject to market conditions. However, the Committee does not propose any specific mode of setting the rate of charge.

The Committee proposes that creditor remuneration should not be reduced from the current level, among other things because the resulting additional income would still fluctuate with the level of IMF credit, and would not be robust in a low-credit environment.

Financing of the provision of public goods

The provision of public goods accounts for around half of the costs of the IMF's activities. To fund these, the Committee proposes new sources of income financed by a wider subset of member countries, since this service is to the benefit of the member countries in general. Specifically, the following three additional sources of income are proposed:

- Broadening the IMF's investment mandate.
- Investment of the proceeds from sale of a part of the IMF's gold stock.
- Investment of quota resources.

The Committee proposes to broaden the IMF's *investment mandate* by allowing longer duration, and by expanding the range of instruments in which the IMF may invest, in line with the investment policies of multilateral development banks with a high credit rating, e.g. the World Bank. This investment mandate applies to resources in the Investment Account established in April 2006 in order to achieve income from the investment of the IMF's reserves.[1]

It is proposed to supplement the current balance of the Investment Account with investment of the proceeds from *sale of gold*.[2] This resource is interest-free and the Committee proposes to use the entire proceeds from investment of the profit from the sale of gold – adjusted for inflation – to cover the IMF's costs. The amount of gold in question is 13 million ounces, or approximately 400 metric tons, for an average book value of only 207 SDR per ounce. The gold is assumed to fetch a market price of at least 500 SDR per ounce.

The Committee emphasises that only a limited amount should be sold, and thus proposes to sell the gold acquired after the Second Amendment of the IMF's Articles of Agreement in 1978. This gold is not subject to the same conditions for sale as the rest of the gold stock. Furthermore, the sale must be coordinated with central-bank gold sale agreements, among other reasons to limit the potential impact on the market. The Committee notes that using this gold would entail a relatively equal distribution of the financing burden among the member countries, since the gold is generally regarded as the joint property of the IMF member countries.

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1 According to the IMF's Articles of Agreement, the IMF may only invest an amount corresponding to its reserves. The reserves were not invested prior to this decision. Instead, they contributed to reducing the IMF's drawings on the member countries' reserve positions and thus helped diminish the amount subject to creditor remuneration. The SDR interest rate thus constituted the implied return on the reserves.

2 In 1956 too, an Investment Account was established for investment of the proceeds from a gold sale in order to contribute to financing the IMF's running costs for administration. This Investment Account was cancelled in 1972.

Finally, the Committee proposes to increase the investment resources by *investing a part of the total quota resources*, i.e. the resources that are currently only made available for re-lending to other member countries (e.g. approximately 10 per cent of the quota resources, or almost SDR 22 billion). The additional income will be generated as the difference between the rate of return and the rate of remuneration to the member countries. It is proposed to keep the remuneration unchanged at the present level, i.e. the SDR interest rate less deductions, cf. Appendix 1. The importance of investing these resources in sufficiently liquid securities is emphasised as the quota funds may be required for lending purposes.

The Committee states that it should be considered whether all member countries should be required to make quota resources available for investment. The alternative option of drawing only on selected creditors, as in the current lending structure, might give the impression that other member countries were not contributing resources for financing.

Financing of bilateral services

The Committee finds that the administration costs of concessional lending to low-income countries should be covered from the funds originally provided to the IMF for this purpose. These costs are thus proposed to be financed via the PRGF-ESF Trust. The costs were previously covered in this way, but since the 1998 fiscal year the Executive Board has allowed the administration costs to be financed via the IMF's general resources.

Technical assistance within the IMF's areas of expertise is classified as a bilateral service and not as a public good. The IMF's management is therefore encouraged to establish a mechanism to charge these services in order to regulate demand. However, the Committee acknowledges that 80 per cent of the costs of technical assistance are related to countries with relatively low income, which are unable to pay for the assistance, but which need it to promote growth, combat poverty and prevent crises. The option of donor contributions from more affluent countries is therefore proposed as one possibility. All in all, the Committee finds that the income generated by charges would hardly be substantial, but that the proposal nevertheless merits closer scrutiny for reasons of principle.

The additional income from the proposal and the decision-making process

The Committee recommends that the financing proposals be considered an overall package, and this proposed financing model is expected to generate additional annual income of SDR 320-420 million, cf. Table 2. This should be compared with an expected deficit of SDR 108 million in the 2007 fiscal year, increasing to SDR 265 million in 2010, cf. Table 1.

THE FINANCING PROPOSAL'S ADDITIONAL INCOME AND THE DECISION-MAKING PROCESS Table 2

Financing proposal	Expected annual additional income	Required majority
Public goods		
Broadened investment mandate		
• Longer duration	SDR 30 million	50 per cent of the IMF's Exec. Board
• Wider range of instruments		Amendment of the IMF's Articles of Agreement[1]
More resources for investment		
• Sale of gold acquired after Second Amendment	SDR 130 million[2]	85 per cent of the IMF's Exec. Board
• Use of quota resources	SDR 10-200 million[3]	Amendment of the IMF's Articles of Agreement[1]
Bilateral services		
Concessional lending		
• Administration costs to be covered by separate trust funds .	SDR 60 million	50 per cent of the IMF's Exec. Board
Technical assistance		
• Separate charging mechanism	Uncertain and probably limited	50 per cent of the IMF's Exec. Board
Dividend policy		50/70 per cent of the IMF's Exec. Board[4]

Note: 1 SDR = 1.5 dollars at end-2006.

Source: Committee of Eminent Persons (2007) and the IMF's Articles of Agreement.

[1] Amendments to the Articles of Agreement can at the earliest enter into force when 3/5 of the member countries holding at least 85 per cent of the voting power have implemented sufficient measures in their national legislation for the amendments to be legally valid in the respective countries.

[2] The sale of gold comprises almost 13 million ounces for an average book value of SDR 207 per ounce. The Committee assumes a sales price of SDR 500 per ounce, and a real annual rate of return of 3 per cent.

[3] The additional income depends on whether the investment mandate is widened.

[4] Distribution of the net income for a given year requires a majority of 50 per cent, while dividend from the general reserves requires a majority of 70 per cent.

The most important financing sources proposed by the Committee require widespread support among the member countries, and several of the proposals even require amendment of the IMF's Articles of Agreement, i.e. adoption by at least 3/5 of the member countries with at least 85 per cent of the total voting power.

IMPLICATIONS OF THE PROPOSAL

The Committee's proposal for a new financing model for the IMF, including the new sources of income, is to be considered by the IMF's Executive Board, which so far has only held preliminary discussions. Denmark is part of the constituency that also comprises the seven other Nordic and Baltic countries.[1]

[1] The IMF's 185 member countries are represented by the 24 members of its Executive Board, including one Nordic-Baltic member. The Nordic and Baltic countries therefore coordinate the constituency's positions on the IMF's policies on an ongoing basis.

The Nordic-Baltic constituency regards the proposed financing model as a sound basis for the ongoing work to ensure a sustainable income model for the IMF. One of the attractive qualities of the proposal is that it broadens the income base, making it less dependent on lending. The division of the IMF's activities into lending, provision of public goods, and bilateral services constitutes a relevant reference framework, but it should be borne in mind that all of the activities have elements of public good. Furthermore, excessively rigorous application of the model may prove to be problematic in practice.

The Nordic-Baltic constituency has also underlined that spending restraint is key to sustainable finances and that new sources of income as such should not increase spending or lead to new activities. A dividend policy can be a useful instrument in this connection. However, as income from the various "branches" might also be required to finance other activities, overall assessment of a dividend policy requires further analysis.

Financing of lending

The proposal entails that the borrowing costs are no longer determined by the IMF's general need for income, including for financing the macroeconomic and financial surveillance of the member countries. The proposal not to reduce the creditor remuneration is a natural extension of the wish to reduce the dependence of income on lending, since a reduction of the rate of remuneration would not make any significant contribution to income in a low-credit environment. Since the description of the principles for determining the rate of charge is not very specific, it is difficult to make any ultimate assessment of this proposal.

Financing of the provision of public goods

The Nordic-Baltic constituency supports a certain broadening of the IMF's investment mandate, but the proposal requires further analysis. The return will be uncertain, and will depend on the shape of the yield curve, and the risk associated with broadening the investment mandate, including the risk of longer duration, is not specified. An expected additional return of 50 basis points thus seems to be rather high in the light of the current market conditions with flat or declining yield curves, as well as central banks' typically prudent investment policies.

The Nordic-Baltic constituency supports the proposed sale of gold, which is designed to entail a number of attractive qualities. The proposal is for an actual sale of gold rather than a de facto revaluation of the book value of the gold, as was the case in 1999-2000.[1] In addition, it

[1] The revaluation of the gold stock in 1999-2000 is described in Danmarks Nationalbank, *Report and Accounts*, 1999, Box 8, p. 91.

is ring-fenced, since it comprises only gold acquired after the Second Amendment of the IMF's Articles of Agreement in 1978. This attenuates the pressure for sale of more gold to generate more income in the future. Another important aspect is that the sale will have no significant impact on the gold market. This plays a key role since the IMF has the third largest official gold reserve in the world. The amount of gold to be sold is around 400 metric tons (or 12.5 per cent of the IMF's total gold stock). Since the proposal keeps the sale within the central-bank gold sale agreements – and is supported by the Committee member from one of the largest gold-producing countries, i.e. Tito Mboweni from South Africa – the impact on the market can be assumed to be minimised.[1]

The Nordic-Baltic constituency finds that investment of quota resources warrants closer analysis. A solution whereby all member countries will contribute to financing to a greater degree seems attractive. The scope for special measures to exempt low-income countries – whose financial resources are scarce – can be investigated further. However, it is unclear whether the requirement for member countries to make resources available for investment is compatible with the function of the reserve position as a central-bank reserve. Borrowing for investment purposes in order to achieve a higher rate of return than the rate of remuneration would be a new approach for the IMF, and the aforementioned caveats regarding the uncertainty of the return on investment are just as relevant in this connection.

Financing of bilateral services

In principle, the Nordic-Baltic constituency agrees that the administration costs of concessional lending to low-income countries should be financed separately via the funds provided for financing of these loans. However, this is likely to reduce the capacity for concessional lending to low-income countries, unless additional contributions are provided, for example from bilateral donors. The Nordic-Baltic constituency finds it important that this lending capacity is not undermined.

Furthermore, the Nordic-Baltic constituency is not convinced of the viability of introducing charges for technical assistance since the low-income countries need this expert advice, but would probably exclude it if they had to pay for it themselves. However, it should be investigated further whether charges can be introduced for more affluent countries. In the light of the limited income potential, however, this issue should

[1] The Committee finds that the sale of gold should not entail an increase in the total official sale of gold. This seems possible as the parties to the Central Bank Gold Agreement II – concluded between a number of European central banks on a limited, coordinated annual sale of gold – in the Agreement's latest year sold only just under 400 metric tons of the 500 tons that constitute the annual limit in volume terms, cf. the World Gold Council.

be considered separately from the discussion of sustainable long-term financing of the IMF.

The implications of the proposed financing model for Danmarks Nationalbank

There is no assessment of the overall consequences of the Committee's proposals for the member countries.

The following conclusions can be drawn as regards Denmark as a creditor country:

- A change in the IMF's investment mandate will not as such have any immediate effect on Danmarks Nationalbank's balance sheet and accounts.
- The remuneration to creditors, including Denmark, will be increased, while the rate of charge will be reduced as a consequence of the proposed sale of gold.

  As a result of a number of technical caveats, the aforementioned deductions from the SDR interest rate for creditors will be reduced in this particular case, and the additions to the rate of charge will be equivalently reduced, resulting in higher remuneration of creditors.[1]
- Danmarks Nationalbank's reserve position with the IMF will be increased by 10-12.5 per cent of Denmark's quota at the described level of investment.

  Quota resources will be invested by drawing on the member countries, which will increase Danmarks Nationalbank's reserve position with the IMF. At the described level of investment of 10 per cent of the total quotas, Danmarks Nationalbank's reserve position will be equivalently increased by 10 per cent of Denmark's quota, i.e. SDR 164 million, if all member countries contribute their respective quota shares. Alternatively, if only the present subset of creditor countries for financing of lending are to contribute quota resources, Danmarks Nationalbank's reserve position will be increased by 12.5 per cent of the quota, i.e. SDR 205 million.
- The proposals for a financing model for bilateral services will have no direct consequences for Danmarks Nationalbank, but as a contributor to the PRGF-ESF Trust, Denmark will contribute indirectly, unless additional resources are contributed to this Trust.[2]

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1 The background is the sale of the gold that was revalued in 1999-2000. The effect of the revaluation on the IMF's finances is described in e.g. International Monetary Fund (2001), Financial Organization and Operations of the IMF, pp. 53-54.

2 Denmark's contribution to concessional lending to low-income countries is described in Danmarks Nationalbank, *Report and Accounts*, 2003, Box 14, p. 87.

It should be noted that for Danmarks Nationalbank, the current opportunity costs of making resources available to the IMF are negligible. The reason is that the IMF draws on Danmarks Nationalbank's short-term placements that are subject to remuneration close to the SDR interest rate.

THE FURTHER PROCESS

In general, the report has been welcomed, but since the Crockett Report does not contain detailed information, a number of unanswered questions remain.

The proposals have not yet been subject to actual discussion by the IMF's Executive Board, but it is clear that this will be a prolonged process, especially in view of the decision-making procedures that currently apply to most of the proposals.

A sufficiently broad majority may be difficult to achieve. Especially the USA will play a key role as the USA's voting power of almost 17 per cent implies a de facto right to veto decisions for which a majority of 85 per cent is required. In this connection, it is noted that the USA has traditionally been against the sale of gold, which constitutes a significant part of the additional income generated by the proposed financing model, and it can be assumed that the sale of gold would have to be approved by the US Congress. Another potentially decisive factor is that amendment of the Articles of Agreement requires implementation, typically ratification, in 3/5 of the member countries with a voting power of 85 per cent.[1]

Other proposals might be considered, notwithstanding the Committee's recommendation to regard the financing proposal as one overall package. For example, one proposal could be to reduce the creditor remuneration, even though this proposal is sensitive to the level of credit unless the quotas are used for investment purposes.[2]

Finally, some countries might adopt the position that the situation is temporary and that the IMF has sufficient reserves for the time being. This position implies that any decision on a new financing model for the IMF would be taken at a later stage. Reserves of SDR 6 billion are sufficient to cover an operational deficit of around SDR 100-250 million for many years to come.

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1 The Fourth Amendment, which was approved by the IMF's Board of Governors in 1997, has not yet entered into force. 131 countries, i.e. more than 3/5 of the member countries, totalling 77.6 per cent of the votes, have accepted the amendments. The USA is not among them.

2 Reduction of the creditor remuneration to below 80 per cent of the SDR interest rate will require amendment of the Articles of Agreement, however.

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APPENDIX 1 – DANMARKS NATIONALBANK'S RESERVE POSITION AND CREDITOR REMUNERATION

Danmarks Nationalbank's financial accounts with the IMF are based on its quota, which is Denmark's member contribution to the IMF. The quota is determined on the basis of each member country's calculated relative weight in the world economy, and determines the voting power in the IMF, the extent of possible drawing on the IMF's resources, and the allocation of Special Drawing Rights, SDR. Furthermore, the quota is key to the distribution of the member countries' contributions to finance lending activities. Since 1999, Denmark's quota has been SDR 1,642.8 million (approximately kr. 14 billion at end-2006).

The member contribution is paid as a mix of national currency (75 per cent of the quota) and "hard currency" and/or gold (25 per cent of the quota), in Denmark's case from Danmarks Nationalbank's foreign-exchange reserve.[1] This gives the IMF a claim on Danmarks Nationalbank – holdings of Danish kroner – and Danmarks Nationalbank a claim on the IMF – the reserve position. In other words, the reserve position is the difference between the quota and the IMF's holdings of Danish kroner. The reserve position amounted to SDR 148 million at end-2006.[2]

The reserve position is included in Danmarks Nationalbank's foreign-exchange reserve. Denmark may use its reserve position without any conditions regarding adjustment of the macroeconomic policy, i.e. conditionality.[3] The contribution of currency to the IMF thus has no impact on the overall foreign-exchange reserve, but only on how it is invested.[4]

A country's reserve position can be regarded as its net creditor position, since the IMF lends the contributed currency to member countries with balance-of-payments difficulties. Countries with a sufficiently strong balance of payments and international liquidity are the principal contributors to this lending system. These countries participate in the Financial Transactions Plan, making foreign exchange available to the IMF. The IMF draws on these creditors to loan to a borrower country under an IMF borrowing programme. As a result, the creditors' reserve positions are increased, and the IMF's holdings of Danish kroner are reduced by the drawing on Danmarks Nationalbank. In essence, hard currency, the foreign-exchange reserves, is "exchanged" for national currency. In years when the level of IMF credit was relatively high, Danmarks Nationalbank's reserve position thus strongly exceeded 25 per cent of Denmark's quota, while at end-2006 it accounted for only 9 per cent of the quota.

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1 Before 1 April 1978, the 25 per cent was payable in gold, while hard currency is the most frequently used contribution today.

2 Cf. Danmarks Nationalbank, *Report and Accounts*, 2006, Table 10 in the Appendix of Tables, p. 165.

3 Drawing on the foreign-exchange reserves via the reserve position requires the existence of a balance-of-payments need, although this need cannot be questioned by the IMF, and there is no obligation to repay the reserves to the IMF.

4 See Mogensen (2003) for a detailed description of how Danmarks Nationalbank's balance sheet is affected by various financial accounts with the IMF.

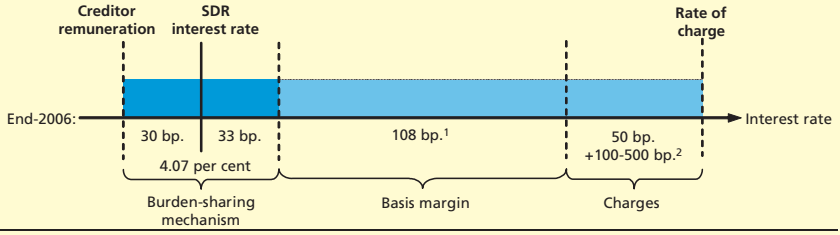
Denmark contributes to the financing of the IMF via two channels: by the part of the reserve position that is not remunerated, and by deductions from the remunerated part for burden-sharing purposes, cf. Box 1.

REMUNERATION IN CONNECTION WITH IMF LENDING — Box 1

Creditor remuneration and the rates of charge are based on the 3-month SDR interest rate, subject to respectively deductions and additions as elements of the *burden-sharing mechanism*. The burden-sharing mechanism is aimed at accumulating reserves as protection against debtors' default on their loans, and both creditors and debtors contribute. At the end of 2006, the SDR interest rate was subject to respectively deductions and additions of approximately 30 basis points for burden-sharing purposes. However, this amount was lower (typically 10-15 basis points) in the preceding years when the level of credit was far higher.

As regards the IMF's debtors, a *basis margin* and further charges are also added to the SDR interest rate, depending on the size of the individual country's loan. So far, the basis margin has been determined residually in order to meet the IMF's targets for income and accumulation of reserves. This means that, all other things being equal, a decline in lending will result in a higher basis margin for the remaining debtors if the target for income and accumulation of reserves remains unchanged. The Chart below shows the relationship between the SDR interest rate and the remuneration of the reserve position and the rate of charge.

REMUNERATION OF RESERVE POSITION AND RATE OF CHARGE



Note: The Chart does not show that part of the reserve position is non-interest-bearing.
Source: Segendorf and Srejber (2006) and IMF's SDR Interest Rate, Rate of Remuneration, Rate of Charge and Burden Sharing Adjustments.
[1] For 2007, the basis margin is temporarily fixed at 108 basis points.
[2] The additional charges depend on the size of the loan and in some cases the time elapsed since the loan was provided.

However, a part of the member countries' reserve position is *non-interest-bearing*. For Denmark, the amount is SDR 65 million, which is the value of the gold contributed by Denmark to the IMF (25 per cent of the quota before 1 April 1978), compiled at the historical price of SDR 35 per ounce.[1] This corresponds to 4.0 per cent of the quota today – so that almost half of the reserve position of 9.0 per cent of the quota was non-interest-bearing at the end of 2006. On average, the non-interest-bearing reserve position amounted to 3.8 per cent of the quota for the member countries overall at the end of the 2006 fiscal year, although considerable variation is observed. For example, the non-interest-bearing reserve position of the UK is 6 per cent of its quota, while the ratio for Saudi Arabia is 0.5 per cent of its quota.

Source: IMF Annual Report (2006), IMF International Financial Statistics and own calculations.
[1] 1 (troy) ounce = 31 grammes.

Speech by Nils Bernstein at the Annual Meeting of the Association of Danish Mortgage Banks on 26 April 2007

There is still high growth in the global economy. Growth has slackened off a little in the USA, but the upswing in Europe and many other parts of the world has become more apparent. The significant global imbalances – especially the large current-account deficit in the USA, which is counterbalanced by substantial surpluses in, for example, China and the OPEC countries – have diminished a little, and the risk of abrupt adjustments is decreasing, but has not been eliminated.

The lower US growth reflects, among other things, that the housing market is adjusting after some years of strong price increases, but the adjustment seems to be moderate and gradual. There is no sign either that the problems faced by companies specialising in mortgage loans to less creditworthy households will spread to other areas of the financial markets.

Concern that the European upswing might be suppressed by Germany's VAT increase has lifted, and the German economic dynamo is powering up.

The overall prospects for Danish exports are favourable, and there will be no lack of demand in the immediate future. On the contrary, exports may be affected by a shortage of production capacity. The Danish economy is at its capacity limit, and many companies find it difficult to recruit the manpower they require.

In more positive terms, employment in Denmark has never been higher, and the unemployment rate is the lowest since the start of the 1970s, and also among the lowest in the world. This also leaves little scope for economic growth in the immediate future. With the prospect of sustained growth in domestic demand, the pressure on capacity will continue unabated.

It will to a high degree be up to us here in Denmark to ensure that we can benefit from the sustained international boom.

The housing market has dampened in recent years after a period of very strong growth in cash prices, in fact so strong that it has also attracted international attention.

Most recently, the big question in Denmark has been whether house prices are about to slump. A certain downward price adjustment in the areas with the largest price increases cannot be excluded. In view of the strong Danish economy it is unlikely, however, that we are on the brink of dramatic general price decreases. In itself it is an advantage that expectations of the future development in prices of owner-occupied homes have dampened, so that property is not bought chiefly to achieve a capital gain.

The change of mood seems to have been most pronounced in the Greater Copenhagen area, and it is also in Copenhagen that house prices have recently fallen, especially for owner-occupied flats. This reflects that prices per square metre have reached a very high level, and that the supply of newly-built homes has augmented. Construction always reacts to rising house prices with a certain time lag. Economic growth in Greater Copenhagen is still strong, however, and prices will be underpinned by the influx of new residents from the rest of the country.

Three quarters of Denmark's owner-occupied homes are located outside Greater Copenhagen. In most areas, prices have risen more slowly, and price falls are less likely.

The higher prices per square metre in recent years have strongly augmented housing wealth, which has increased by kr. 670 billion since the start of 2005. Borrowing has also risen, but not by any means to the same extent. Home equity has grown by an estimated kr. 550 billion over two years. This ensures that there is a significant buffer against any future price drops.

Rising house prices are first and foremost to the benefit of those of us that already own a home. The majority of the population are homeowners and this is probably one of the reasons that the high price increases have not provoked strong protests.

Stagnating and perhaps falling house prices will be to the benefit of first-time home buyers. For those who bought their homes when prices peaked any price drops will naturally be less welcome. However, only a small proportion of the owner-occupied homes changed hands at the very high prices. Around 5 per cent of one-family houses in Denmark are sold each year, so that for most homeowners a small price drop will just mean that a small part of the capital gain that emerged so quickly will disappear. The increase in interest rates moreover diminishes the market value of the outstanding debt, unless the home is financed at variable interest rates.

Danmarks Nationalbank assesses that in the short term the slowdown in the housing market will have only a limited effect on the economy in

general. Once the construction backlog has been eliminated, new construction and conversion activity will probably dampen, but that is still far off, and furthermore, business construction is increasing. In addition, private consumption has only been affected by the increasing housing wealth to a small degree. Since 2004 the propensity to consume has shown an increase equivalent to approximately kr. 15 billion, while housing wealth has risen by kr. 670 billion. It is true that the capital gains have been further mortgaged, but the proceeds have mainly been used for home improvements or pension contributions, or invested in other financial assets.

For more than 200 years we have had a secure mortgage financing system with a large, standardised mortgage-credit bond market that has given borrowers access on equal terms to finance real property at long-term interest rates in the capital market. However, in recent times the mortgage-credit system has undergone many changes:

Mortgage credit no longer comprises associations of borrowers, with members holding joint and several liability that join forces to gain access to a less developed capital market. Today, the players are profit-maximising limited-liability companies in an economy with well-developed capital markets.

Mortgage-credit institutes and banks have become more closely connected in different ways. Credit institutions from other EU member states can compete freely in Denmark, and Danish credit institutions have become active in financing real property abroad.

Finally, there has been considerable development of new products – for example adjustable-rate loans, capped adjustable-rate loans and deferred-amortisation loans. In this way, mortgage credit has become a product like other commercial financial products in an open economy with a mature financial system.

This dynamic has not changed Danmarks Nationalbank's fundamental perception of the mortgage-credit system. Danmarks Nationalbank has always found it to be a secure system, beneficial for borrowers, lenders, the capital market, and financial stability.

Now a new type of covered bonds enters the market, called SDOs. At the last Annual Meeting I called for a thorough review of the future regulations for use of SDOs. I would like to acknowledge that this review has been undertaken, and there is now political agreement on a new act on SDOs.

Overall, I believe this to be a good result. The bill also makes it possible for the mortgage-credit institutes to provide mortgage credit financed by issuing bonds in exactly the same way as today. Danmarks Nationalbank has considered this to be important.

For some years the banks have competed with the mortgage-credit institutes to offer mortgage credit, among other things by introducing their mortgage loans. In addition, they also increasingly compete with foreign credit institutions – both in Denmark and abroad.

Now the banks will have the opportunity to obtain financing by issuing SDOs against mortgage loans as collateral. This sharpens competition and also gives the banks a new and stable source of financing to counter the growing deposit shortfall, to the benefit of financial stability.

I don't want to deny that at Danmarks Nationalbank we believe that the current mortgage-credit legislation, of which one cornerstone is a tight balance principle, has functioned well.

The purpose of a balance principle is to limit the issuers risk to credit risk. Both the present and the proposed new balance principle fundamentally entail the rule that no interest-rate risks, option risks or exchange-rate risks may be taken.

Today, risks are mainly covered by selling bonds that exactly match the mortgage loans, and this will naturally still be possible under the new balance principle, if wished for. However, the new balance principle also makes it possible to cover the risks using modern financial instruments to a greater extent.

The new legislation on SDOs also comprises a tightening of mortgage-credit legislation, required by EU-legislation, namely that throughout the duration of the loan no mortgage loan may have a value that exceeds 80 per cent of the value of the home that is mortgaged. Today, this only applies at the point in time when the loan is raised, as you will know.

If house prices fall, the credit institutions must to the extent necessary, re-establish the collateral behind the issued SDOs, e.g. by raising loans and buying government securities to use as collateral. This means that the new SDOs will always be backed with sound collateral, and this will limit the refinancing risk.

Overall, Danmarks Nationalbank assesses that the regulation on SDOs provides a basis for a mortgage financing system that is just as safe as today's mortgage-credit system. Now it remains to be seen how the market will receive the new bonds.

In principle, the introduction of a new mortgage financing instrument that can also be used by banks must be expected to increase competition. This is by no means detrimental, but it does require consumers to be active and capable of understanding the opportunities made available to them. The extensive work of devising methods to ensure transparency still remains to be undertaken.

The cross-border integration of the financial markets is one of the more striking phenomena of the last 30 years. This integration makes

high demands of the underlying infrastructure. Cross-border securities trading still entails considerable costs.

On this basis, the European Central Bank, ECB, has taken the initiative to improve the cross-border trading of securities within the EU.

Target2-Securities is the name of a new common European system for settlement of securities denominated first and foremost in euro, but later also for settlement in other currencies.

The objective of the project is to make it just as simple, inexpensive and efficient to settle securities trades across national borders within the EU as it is to settle domestic trades.

At the beginning of 2008 the ECB is expected to take the final decision on whether to develop the system.

The user requirements of the system will be determined in the near future. Danmarks Nationalbank and VP Securities Services have commenced the collection and coordination of the Danish input to the user requirements.

I would like to conclude by on behalf of Danmarks Nationalbank acknowledging the excellent cooperation with both the Association of Danish Mortgage Banks and its members over the past year.

Press releases

22 FEBRUARY: NEW COIN SERIES WITH POLAR THEME

To mark the International Polar Year, Danmarks Nationalbank launches the first coin in a new series of polar coins on 26 March 2007.

The new Polar series will comprise three coins, which will be issued in the period 2007 to 2009.

The motif of the first coin is a polar bear. The polar bear is chosen because of its great importance to the Greenland culture. On the coin you will see the polar bear standing on a split ice floe. The motif is designed by the Greenland artist Niels Motzfeldt, who also designed the motif on the tower coin "Three Brothers". The obverse of the coin carries a portrait of the Queen in profile.

The Polar coin is minted as a 10-krone coin in 1.2 million copies and will be part of the ordinary coin circulation. The Polar coin will also be issued as collector coins in fine silver and gold. The silver version will have the face value of 100 kroner, while the gold coin will have a face value of 1,000 kroner. The recommended retail prices including Danish VAT are DKK 2,500 for the gold coin and DKK 300 for the silver coin. The gold and silver coins are minted in a number not exceeding 6,000 and 50,000, respectively.

The gold coins are minted in gold originating from Greenland. Danmarks Nationalbank has acquired the gold from the Nalunaq Gold Mine by Nanortalik in the South of Greenland. This goldmine also delivered the gold to the wedding rings of the Danish Crown Prince and Crown Princess. It is the first time that a coin is minted in gold originating from Greenland. The legend on the gold coin also shows a small polar bear, which is used as a symbol for gold originating from Greenland.

The Polar coins can be purchased from banks, coin dealers and Danmarks Nationalbank from 26 March. The coins can also be acquired from the website of the Royal Mint, www.royalmint.dk, where orders can be placed as from today. Pictures of the coin can also be downloaded from this website.

8 MARCH 2007: INTEREST RATE INCREASE

Danmarks Nationalbank's lending rate and the rate of interest on certificates of deposit are raised by 0.25 per cent to 4.00 per cent. The dis-

count rate and the interest rate on the banks' current accounts with Danmarks Nationalbank are raised by 0.25 per cent to 3.75 per cent. The increase will have effect as from 9 March 2007.

The interest rate increase is a consequence of the raising by the European Central Bank of the minimum bid rate on the main refinancing operations by 0.25 per cent to 3.75 per cent.

20 MARCH: VÆDDEREN (THE RAM) IS THE MOTIF ON THE FIRST COIN IN A NEW SHIP SERIES

On 25 April 2007, Danmarks Nationalbank issues the first coin in a new series of 20-krone coins with ships as their common theme. To mark the return of the Galathea 3 Expedition to Denmark, the first coin in the series has the surveillance vessel Vædderen (the Ram) as its motif.

Vædderen has been circumnavigating the Earth on the third Galathea Expedition since August 2006 and is expected to dock at Langelinie in the Port of Copenhagen on 25 April 2007. Galathea 3 is the largest Danish research expedition in more than 50 years and its objective is to promote Danish research.

The sculptor Øivind Nygård designed the Vædderen motif.

"Vædderen is currently a floating research centre, and this adds an extra dimension to the ship's inherent dynamism in view of its structure and flowing movement. Money also flows and is often at the hub of great activity. It was natural to take this dynamism as my point of departure for a depiction of Vædderen," says Øivind Nygård.

The Vædderen coin is issued as a 20-krone coin in an edition of 1.2 million. It is of the same size and alloy as the ordinary 20-krone coin in circulation. The obverse of the coin shows a profile of the Queen by the sculptor, Professor Mogens Møller.

The new thematic coin can be purchased from banks, Danmarks Nationalbank, Banking Services, and the website of the Royal Mint, www.royalmint.dk, from 25 April 2007. The next ship coin is expected to be issued in the autumn of 2007.

Pictures of the coin and statements by the sculptor Øivind Nygård can be found at the website of the Royal Mint, www.royalmint.dk.

9 MAY: TOWER COIN WITH COPENHAGEN CITY HALL TOWER AND TOWER COIN SET ISSUED ON 20 JUNE 2007

Copenhagen City Hall Tower is the motif of the tenth and final tower coin, which is issued on 20 June 2007. The motif is designed by the sculptor Lis Nogel, who also designed the motif for the first coin in the series, Aarhus City Hall Tower.

The Copenhagen City Hall Tower coin is issued as a 20-krone coin in an edition of 1.2 million. It is of the same size and alloy as the ordinary 20-krone coin in circulation. The obverse of the coin shows a profile of the Queen by the sculptor, Professor Mogens Møller.

In connection with the issue of the final tower coin, a coin set comprising all 10 coins in the series, minted in the extra-fine BU quality, is issued. The coins in the set are uncirculated and minted with two strokes instead of one. The tower coin set is issued in an edition of maximum 30,000 at a price of DKK 495 per set, including VAT. Like the new tower coin, the coin set can be purchased from banks, Danmarks Nationalbank, Banking Services, and the website of The Royal Mint, www.kgl-moent.dk, from 20 June 2007.

The tower coins will be replaced by a ship series. The first coin in this series, with the surveillance vessel Vædderen (the Ram) of the Galathea 3 Expedition as its motif, was issued 25 April 2007. The new motifs on the thematic coins stimulate interest in coins among the general public. Read more about the thematic coins on the website of The Royal Mint.

14 MAY: KARIN BIRGITTE LUND CHOSEN TO DESIGN NEW DANISH BANKNOTE SERIES

Danmarks Nationalbank has decided that the new Danish banknote series will be based on the draft proposal by Karin Birgitte Lund that was chosen from among the eight draft proposals published in January 2007. The draft proposals from Karin Birgitte Lund and Kaspar Bonnén both had great potential, so that these two artists were asked to elaborate on their designs before Danmarks Nationalbank took its final decision on which of the two proposals was most appropriate for a new Danish banknote series. On the basis of the detailed designs, Danmarks Nationalbank has now chosen Karin Birgitte Lund's proposal.

Governor Torben Nielsen motivates the choice: "In her draft proposal, Karin Birgitte Lund shows bridges as links, not only between various parts of Denmark, but also between the past and the present. The proposal has splendid naturalist qualities, and her fine line and classical expression are well suited for the future banknotes."

All the eight draft proposals, as well as sketches for Danish coins, will be on public display at the Køge Art Museum of Sketches in the period 22 June to 9 September 2007.

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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: 18 June 2007.

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: Discount rate	The Nationalbank's interest rates: Lending and certificates of deposit	The Nationalbank's interest rates: The ECB's minimum bid rate	End of period	Inter-bank interest rate, 3-months uncollateralized	Bond yields: 10-year central-government bond	Bond yields: 30-year mortgage-credit bond	Share-price index OMXC20 (prev.KFX)
	Per cent per annum				Per cent per annum			3.7.89 =100
2002	2.75	2.95	2.75	2002	3.00	4.45	5.47	199.49
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
2006 8 Dec ..	3.50	3.75	3.50	Nov 06	3.71	3.74	5.19	424.33
2007 9 Mar ..	3.75	4.00	3.75	Dec 06	3.81	3.95	5.24	441.48
7 Jun ..	4.00	4.25	4.00	Jan 07	3.90	4.06	5.28	462.84
				Feb 07	3.98	3.96	5.23	455.44
				Mar 07	4.06	4.05	5.23	466.59
				Apr 07	4.16	4.23	5.33	485.46
18 Jun ...	4.00	4.25	4.00	May 07	4.28	4.49	5.48	500.57

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						
2002	193.2	47.7	50.3	160.7	10.1	81.2	89.6
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
Dec 06	171.8	59.8	71.5	163.2	9.0	153.7	18.4
Jan 07	173.7	57.6	69.7	167.5	21.0	160.4	28.1
Feb 07	178.1	57.2	62.6	179.4	13.5	153.3	39.5
Mar 07	181.3	58.2	68.4	160.9	7.0	129.7	38.2
Apr 07	170.6	58.7	53.7	151.5	19.8	129.9	41.4
May 07	171.7	59.8	59.1	126.4	19.1	109.7	35.8

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
	Kr. billion							
2002	115.5	121.9	-6.4	45.4	-0.9	-2.4	35.7	89.6
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
Dec 06	-1.9	-5.9	4.0	0.1	-5.2	-0.6	-1.7	18.4
Jan 07	5.5	3.1	2.4	0.6	4.7	2.0	9.7	28.1
Feb 07	-5.9	-13.8	7.9	3.7	0.1	-0.3	11.4	39.5
Mar 07	-2.4	1.9	-4.3	1.0	0.0	1.9	-1.4	38.2
Apr 07	5.6	1.4	4.2	-0.2	-0.1	-0.6	3.3	41.4
May 07	-5.6	-0.9	-4.6	0.4	-0.1	-1.3	-5.6	35.8

SELECTED ITEMS FROM THE CONSOLIDATED BALANCE SHEET OF THE MFI SECTOR

Table 4

End of period	Total balance	Assets				Liabilities		Foreign assets, net [1]
		Domestic lending		Domestic securities				
		Public sector	Private sector	Bonds, etc.	Shares, etc.	Domestic deposits	Bonds, etc. issued	
	Kr. billion							
2002	3,198.5	79.9	1,944.6	142.8	36.5	723.3	1,125.9	-66.8
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	4,227.5	107.8	2,584.2	75.3	53.4	971.3	1,321.3	-172.9
2006	4,681.8	116.8	2,953.9	51.1	60.2	1,076.8	1,437.4	-223.1
Nov 06	4,642.4	115.8	2,921.0	40.7	58.5	1,095.4	1,388.2	-226.0
Dec 06	4,681.8	116.8	2,953.9	51.1	60.2	1,076.8	1,437.4	-223.1
Jan 07	4,739.3	121.0	2,973.2	47.6	62.0	1,099.7	1,428.3	-237.7
Feb 07	4,806.6	116.9	3,010.2	47.5	62.3	1,097.1	1,444.5	-254.5
Mar 07	4,879.1	115.7	3,056.8	42.0	65.9	1,130.9	1,456.8	-251.7
Apr 07	4,929.9	114.9	3,068.0	41.8	65.4	1,114.5	1,465.6	-262.1
	Change compared with previous year, per cent							
2002	...	6.6	5.1	7.3	-1.4	5.4	7.4	...
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	-25.3	15.3	14.4	8.1	...
2006	...	8.3	14.3	-32.1	12.6	10.9	8.8	...
Nov 06	...	12.5	14.5	-29.5	13.0	14.7	12.0	...
Dec 06	...	8.3	14.3	-32.1	12.6	10.9	8.8	...
Jan 07	...	10.1	14.6	-40.9	14.7	3.5	10.2	...
Feb 07	...	9.0	14.6	-26.6	15.3	12.9	9.3	...
Mar 07	...	6.5	13.9	-3.4	21.4	14.1	9.6	...
Apr 07	...	3.2	13.3	-15.0	18.8	10.5	11.1	...

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.

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

MONEY STOCK Table 5

End of period	Bank-notes and coin in circula-tion	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 orginal maturity =< 2 years	M3
	Kr. billion								
2002	39.0	399.1	438.1	102.7	18.5	559.3	6.6	45.2	611.2
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	50.8	648.5	699.3	143.0	17.9	860.1	8.0	21.3	889.5
Nov 06	49.5	634.8	684.3	162.0	18.9	865.3	16.6	7.1	889.1
Dec 06	50.8	648.5	699.3	143.0	17.9	860.1	8.0	21.3	889.5
Jan 07	49.2	655.0	704.1	155.7	16.8	876.6	9.8	28.1	914.7
Feb 07	49.1	648.4	697.5	169.2	16.4	883.0	11.2	25.4	919.8
Mar 07	49.9	669.8	719.7	174.1	16.5	910.3	9.9	28.9	949.2
Apr 07	50.2	679.6	729.8	164.2	16.7	910.7	7.7	25.5	944.1
	Change compared with previous year, per cent								
2002	...	...	3.9	...	...	4.6	...	...	11.8
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
Nov 06	...	...	6.4	...	...	9.2	...	...	11.3
Dec 06	...	...	8.7	...	...	10.8	...	...	11.4
Jan 07	...	...	0.0	...	...	0.8	...	...	4.4
Feb 07	...	...	9.8	...	...	10.3	...	...	13.4
Mar 07	...	...	10.4	...	...	11.7	...	...	12.6
Apr 07	...	...	8.9	...	...	10.4	...	...	10.9

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							
2002	2,040.1	419.8	599.2	253.5	231.3	620.9	685.6	764.7
2003	2,204.4	468.7	662.9	271.5	285.7	764.4	823.8	795.1
2004	2,418.3	495.6	754.8	324.8	309.6	780.3	823.1	908.0
2005	2,862.9	651.6	920.1	396.6	370.0	858.3	972.0	1,065.6
2006	3,244.4	715.0	1,124.0	474.9	457.8	889.6	1,133.6	1,148.2
Nov 06	3,226.8	700.2	1,097.5	454.8	443.8	934.9	1,101.1	1,138.2
Dec 06	3,244.4	715.0	1,124.0	474.9	457.8	889.6	1,133.6	1,148.2
Jan 07	3,323.1	750.5	1,134.0	469.9	455.2	942.3	1,167.6	1,164.3
Feb 07	3,380.8	704.5	1,155.0	475.1	469.9	1,019.4	1,224.1	1,150.5
Mar 07	3,447.7	758.6	1,181.5	487.7	487.1	976.7	1,214.0	1,191.9
Apr 07	3,470.9	764.8	1,178.7	489.0	488.4	965.5	1,171.5	1,198.0
	Change compared with previous year, per cent							
2002	...	18.9	1.9	0.1	1.1	7.2	9.3	6.5
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	...	31.6	21.9	22.1	19.5	10.0	18.1	17.3
2006	...	9.7	22.2	19.8	23.7	3.6	16.6	7.8
Nov 06	...	16.1	22.8	21.0	23.6	-0.5	8.8	10.0
Dec 06	...	9.7	22.2	19.8	23.7	3.6	16.6	7.8
Jan 07	...	25.5	23.3	20.8	22.1	3.9	25.5	5.5
Feb 07	...	19.7	23.4	20.7	23.6	14.5	28.3	10.1
Mar 07	...	23.3	21.4	19.4	24.0	9.4	25.5	10.7
Apr 07	...	26.2	19.5	19.1	22.1	7.4	19.1	11.9

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	Total balance	Assets					Liabilities	
		Lending to MFIs	Domestic lending			Holdings of securities	Loans from MFIs	Bonds, etc. issued
			Total	of which:				
				House-holds, etc.	Non-financial compa-nies			
	Kr. billion							
2002	1,721.8	77.3	1,285.1	988.0	259.2	338.5	58.9	1,584.2
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
Nov 06	2,244.4	182.1	1,828.2	1,402.7	370.3	186.9	167.3	1,917.2
Dec 06	2,699.9	245.1	1,834.8	1,407.7	370.8	574.1	226.5	2,297.9
Jan 07	2,205.8	176.9	1,847.6	1,418.3	373.3	145.0	170.6	1,884.0
Feb 07	2,236.3	189.5	1,859.6	1,427.0	376.5	145.3	178.8	1,905.5
Mar 07	2,281.5	227.6	1,875.1	1,436.8	381.0	148.1	191.0	1,929.9
Apr 07	2,283.8	208.4	1,888.8	1,447.1	384.7	146.8	191.5	1,921.7
	Change compared with previous year, per cent							
2002	...	-12.5	7.8	8.9	5.0	20.6	6.7	11.5
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
Nov 06	...	168.7	10.6	10.5	10.5	-15.3	132.3	6.1
Dec 06	...	141.7	10.2	9.9	10.9	-11.0	49.3	2.7
Jan 07	...	58.5	10.2	9.9	10.6	7.8	69.7	7.3
feb 07	...	53.5	10.0	9.7	10.9	3.3	77.0	7.5
Mar 07	...	44.2	9.7	9.3	9.8	-4.2	65.8	7.6
Apr 07	...	65.6	9.6	9.1	10.1	4.3	78.8	8.9

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								
2002	1,917.0	1,241.6	619.2	631.8	253.5	353.0	1,285.1	988.0	266.2
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	3,000.4	1,882.6	1,014.9	1,165.7	474.9	636.6	1,834.8	1,407.7	378.3
Nov 06	2,967.4	1,857.4	1,009.7	1,139.2	454.8	632.1	1,828.2	1,402.7	377.7
Dec 06	3,000.4	1,882.6	1,014.9	1,165.7	474.9	636.6	1,834.8	1,407.7	378.3
Jan 07	3,017.8	1,888.2	1,019.4	1,170.2	469.9	638.5	1,847.6	1,418.3	380.9
Feb 07	3,050.8	1,902.1	1,042.7	1,191.2	475.1	658.6	1,859.6	1,427.0	384.2
Mar 07	3,092.7	1,924.5	1,065.6	1,217.6	487.7	676.6	1,875.1	1,436.8	389.0
Apr 07	3,103.6	1,936.0	1,066.3	1,214.8	489.0	673.6	1,888.8	1,447.1	392.8
	Change compared with previous year, per cent								
2002	5.7	6.9	4.1	1.5	0.1	3.1	7.8	8.9	5.5
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	24.7	10.2	9.9	10.7
Nov 06	15.2	12.9	18.7	23.4	21.0	24.4	10.6	10.5	10.2
Dec 06	14.8	12.2	19.1	22.7	19.8	24.7	10.2	9.9	10.7
Jan 07	14.9	12.5	18.7	23.3	20.8	24.3	10.2	9.9	10.4
Feb 07	14.9	12.3	19.2	23.4	20.7	24.8	10.0	9.7	10.7
Mar 07	14.0	11.7	17.8	21.4	19.4	23.0	9.7	9.3	9.7
Apr 07	13.2	11.5	16.3	19.3	19.1	20.3	9.6	9.1	10.0

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		Lending in foreign currency	Instalment-free lending[1]
	Kr. billion						
2002	103.6	816.0	365.0	200.4	1,284.6	82.5	...
2003	99.5	795.0	499.0	250.0	1,393.5	85.7	44.4
2004	94.6	737.6	656.1	378.4	1,488.4	84.9	170.5
2005	88.6	760.1	814.1	576.2	1,662.8	80.5	315.5
2006	83.5	878.4	870.7	639.5	1,832.7	85.7	432.2
Nov 06	86.2	855.2	885.4	653.4	1,826.8	87.8	422.3
Dec 06	83.5	878.4	870.7	639.5	1,832.7	85.7	432.2
Jan 07	83.7	887.5	874.9	646.0	1,846.1	87.0	438.6
Feb 07	83.9	895.6	878.0	648.8	1,857.5	88.2	446.6
Mar 07	84.2	905.1	883.6	652.7	1,872.9	90.8	456.7
Apr 07	84.4	916.5	885.7	653.8	1,886.6	92.4	464.6

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

[1] The mortgage-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
	Per cent, per annum							
Q1 05	5.1	6.7	4.8	2.8	1.7	1.3	1.7	2.1
Q2 05	4.9	6.5	4.6	2.7	1.7	1.3	1.7	2.1
Q3 05	4.8	6.3	4.5	2.6	1.7	1.3	1.7	2.2
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
Nov 06	5.5	6.8	5.3	3.5	2.7	2.3	2.9	3.1
Dec 06	5.5	6.9	5.2	3.6	2.9	2.5	3.0	3.3
Jan 07	5.6	7.1	5.4	3.6	3.0	2.7	3.1	3.3
Feb 07	5.7	7.2	5.5	3.6	3.1	2.8	3.2	3.4
Mar 07	5.7	7.1	5.5	3.8	3.3	3.0	3.3	3.6
Apr 07	5.9	7.2	5.6	4.0	3.3	3.0	3.3	3.7

SELECTED ITEMS FROM THE BALANCE SHEET OF THE INVESTMENT ASSOCIATIONS

Table 11

End of period	Total balance	Assets: Holdings of securities: Bonds, etc.	Assets: Holdings of securities: Shares, etc.	Liabilities: Certificates issued by investment associations by owner: Households, etc.	Liabilities: Certificates issued by investment associations by owner: Insurance companies and pension funds	Liabilities: Certificates issued by investment associations by owner: Other residents	Liabilities: Certificates issued by investment associations by owner: Abroad
	Kr. billion						
2002	288.9	180.8	89.5	153.6	68.9	52.7	8.9
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
Q1 06	843.9	409.2	330.1	281.1	248.6	281.2	27.8
Q2 06	835.0	404.0	327.8	269.6	259.1	277.0	24.6
Q3 06	879.0	424.7	351.6	282.4	272.6	292.6	25.9
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
	Quarterly transactions, kr. billion						
Q1 06	...	4.8	21.4	9.7	5.0	8.9	3.1
Q2 06	...	5.0	14.6	3.4	11.7	4.7	-1.8
Q3 06	...	9.7	5.8	4.6	1.0	3.8	0.2
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

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	Denmark	Abroad
	Market value, kr. billion							
2002	1,999.8	414.7	479.8	222.9	1,411.6	189.6	384.3	162.3
2003	2,124.2	419.6	488.2	210.0	1,523.9	207.9	488.1	208.6
2004	2,393.0	429.7	493.1	228.3	1,785.9	198.6	592.1	244.5
2005	2,560.1	461.2	435.2	205.1	2,002.9	252.5	827.1	298.2
2006	2,555.2	457.9	387.6	172.2	2,041.2	279.5	950.9	352.5
Dec 06	2,555.2	457.9	387.6	172.2	2,041.2	279.5	950.9	352.5
Jan 07	2,096.4	452.5	377.9	178.2	1,599.3	267.8	992.4	362.4
Feb 07	2,103.1	450.6	367.5	170.6	1,614.2	272.5	968.5	361.9
Mar 07	2,108.3	467.5	353.3	181.0	1,633.4	278.9	989.3	379.1
Apr 07	2,103.8	451.3	347.2	171.2	1,631.1	272.3	1,032.3	407.7
May 07	2,090.4	454.5	333.7	175.6	1,632.3	269.8	1,071.9	432.5

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
	Kr. billion							
2002	583	188	320	1,171	2,262	1,431	830	2,261
2003	620	166	399	1,262	2,449	1,509	940	2,449
2004	668	175	472	1,397	2,712	1,640	1,073	2,712
2005	768	173	612	1,609	3,161	1,839	1,322	3,161
2006	835	182	709	1,654	3,381	2,052	1,329	3,381
Q4 05	768	173	612	1,609	3,161	1,839	1,322	3,161
Q1 06	770	167	644	1,594	3,174	1,870	1,304	3,174
Q2 06	794	169	628	1,551	3,142	1,913	1,229	3,142
Q3 06	817	178	666	1,626	3,287	1,994	1,293	3,287
Q4 06	835	182	709	1,654	3,381	2,052	1,329	3,381

COMPANIES' FINANCIAL ASSETS AND LIABILITIES — Table 14

End of period	Assets				Liabilities				
					Debt				
	Currency, bank deposits and granted credits, etc.	Bonds, etc.	Shares and certificates issued by investment associations, etc.	Total	Loans, etc.	Bonds, etc. issued	Shares, etc. issued	Net financial assets	Total
	Kr. billion								
2002	533	117	639	1,290	1,130	96	937	-872	1,290
2003	661	121	643	1,425	1,152	109	1,124	-960	1,426
2004	639	163	738	1,540	1,204	144	1,239	-1,048	1,539
2005	725	164	967	1,856	1,346	148	1,511	-1,149	1,856
2006	733	151	1,099	1,984	1,574	140	1,582	-1,312	1,984
Q4 05	725	164	967	1,856	1,346	148	1,511	-1,149	1,856
Q1 06	749	151	1,044	1,944	1,461	131	1,529	-1,177	1,944
Q2 06	749	144	994	1,887	1,473	149	1,450	-1,186	1,887
Q3 06	766	154	1,051	1,969	1,540	145	1,525	-1,241	1,970
Q4 06	733	151	1,099	1,984	1,574	140	1,582	-1,312	1,984

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					
2002	64.3	17.8	82.1	-24.7	-23.3	34.1
2003	65.9	23.2	89.2	-16.8	-24.0	48.3
2004	55.1	19.8	74.9	-2.4	-27.7	44.7
2005	44.4	38.6	83.0	0.7	-24.7	58.9
2006	17.9	39.9	57.8	8.3	-26.4	39.7
May 05 - Apr 06	34.9	40.3	75.1	2.5	-25.5	52.1
May 06 - Apr 07	6.8	37.2	44.0	12.5	-28.4	28.1
Nov 06	2.0	2.6	4.5	0.8	-2.1	3.3
Dec 06	0.9	1.4	2.3	0.0	-2.0	0.2
Jan 07	0.2	1.7	1.9	0.9	-3.0	-0.2
Feb 07	-2.8	1.5	-1.3	-0.5	-3.3	-5.1
Mar 07	0.6	2.7	3.3	-2.2	-2.7	-1.6
Apr 07	-2.9	2.9	0.0	2.3	-3.1	-0.7

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 [1]	Danmarks Nationalbank's transactions with abroad [2]
		Direct investments		Portfolio investments	Other capital import		
		Danish abroad	Foreign in Denmark				
	Kr. billion						
2002	35.3	-44.9	52.3	1.2	21.3	-19.8	45.4
2003	48.3	-8.0	17.8	-98.3	72.5	-1.5	30.8
2004	44.9	62.1	-62.6	-87.1	-22.5	58.9	-6.2
2005	60.6	-90.1	78.6	-66.9	23.9	-17.9	-11.8
2006	39.3	-48.6	41.8	-104.2	78.5	-44.8	-37.9
May 05 - Apr 06	51.4	-109.8	112.2	-125.9	64.8	-42.6	-50.0
May 06 - Apr 07	...	-71.3	24.4	55.9	-31.3	...	-9.4
Nov 06	3.2	1.2	4.0	-29.9	28.5	-5.8	1.2
Dec 06	-0.4	35.8	-33.7	3.3	-21.2	8.0	-8.2
Jan 07	0.3	-1.8	4.2	-4.5	6.1	-2.7	1.6
Feb 07	-2.9	-36.0	6.3	-36.4	75.8	-2.7	4.1
Mar 07	-0.5	-11.6	6.1	78.6	-69.7	1.0	3.9
Apr 07	...	-12.3	9.4	5.0	-21.8	...	-10.4

[1] Including errors and omissions and until end-December 2004 unrecorded trade credits.
[2] 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		
	Krone-denominated bonds, etc.	Foreign currency denominated bonds, etc.	Shares	Bonds, etc.	Shares	Total
	Kr. billion					
2002	8.5	24.0	4.9	-34.8	-1.4	1.2
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	20.9	123.4	-19.5	-108.2	-83.5	-66.9
2006	10.6	66.4	-28.1	-21.2	-131.9	-104.2
Nov 06	-20.2	13.2	11.7	-29.4	-5.1	-29.9
Dec 06	16.9	-5.1	1.3	5.3	-15.1	3.3
Jan 07	0.7	23.2	2.4	-14.2	-16.6	-4.5
Feb 07	-0.2	5.1	7.5	-20.3	-28.5	-36.4
Mar 07	13.2	31.2	-1.1	41.8	-6.4	78.6
Apr 07	-3.0	9.2	7.8	-2.2	-6.9	5.0

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									
Assets										
2002	465	148	253	359	14	57	451	34	199	1,979
2003	413	198	309	446	17	57	518	31	230	2,220
2004	459	214	369	548	48	31	584	20	223	2,495
2005	560	244	555	684	70	34	720	19	217	3,103
2006	620	230	738	671	57	37	827	28	178	3,385
Q4 05	560	244	555	684	70	34	720	19	217	3,103
Q1 06	578	256	674	633	62	36	730	24	186	3,178
Q2 06	577	264	639	607	42	39	743	26	186	3,122
Q3 06	607	283	677	643	68	36	811	27	185	3,336
Q4 06	620	230	738	671	57	37	827	28	178	3,385
Liabilities										
2002	393	194	146	756	•	30	669	13	4	2,206
2003	434	162	186	762	•	28	801	13	4	2,391
2004	427	202	238	857	•	17	819	27	2	2,589
2005	506	225	307	1,020	•	23	970	29	3	3,083
2006	518	265	360	1,063	•	27	1,140	42	4	3,420
Q4 05	506	225	307	1,020	•	23	970	29	3	3,083
Q1 06	535	240	289	1,008	•	24	1,036	33	1	3,166
Q2 06	537	242	269	1,010	•	25	1,066	34	1	3,186
Q3 06	546	273	292	1,056	•	26	1,111	42	2	3,349
Q4 06	518	265	360	1,063	•	27	1,140	42	4	3,420
Net assets										
2002	73	-45	106	-397	14	27	-218	20	195	-225
2003	-21	36	123	-315	17	29	-283	19	226	-170
2004	32	12	131	-309	48	14	-234	-7	221	-93
2005	54	19	249	-336	70	11	-250	-10	214	20
2006	101	-35	378	-392	57	9	-312	-14	174	-34
Q4 05	54	19	249	-336	70	11	-250	-10	214	20
Q1 06	43	17	385	-376	62	12	-306	-9	185	12
Q2 06	39	22	369	-404	42	14	-323	-7	185	-64
Q3 06	61	10	385	-414	68	10	-301	-15	182	-13
Q4 06	101	-35	378	-392	57	9	-312	-14	174	-34

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

GDP BY TYPE OF EXPENDITURE Table 19

	GDP	Final domestic demand					Exports of goods and services	Imports of goods and services
		Private consumption	General-government consumption	Gross fixed capital formation	Change in inventories	Total		
	Kr. billion							
2002	1,372.7	652.3	360.2	270.8	9.3	1,292.6	648.3	568.2
2003	1,400.7	666.9	371.2	271.8	3.2	1,313.1	635.1	547.6
2004	1,459.4	708.5	388.5	285.5	4.9	1,387.4	666.8	594.8
2005	1,552.0	754.1	401.4	319.2	3.9	1,478.6	757.1	683.8
2006	1,637.6	796.0	418.3	365.4	10.3	1,590.1	849.4	801.9
Q1 06	389.8	192.5	101.5	81.9	2.7	378.6	200.2	188.9
Q2 06	414.9	200.7	104.1	93.1	3.3	401.2	212.9	199.2
Q3 06	409.2	194.3	104.4	89.8	3.8	392.3	215.9	199.0
Q4 06	423.7	208.5	108.4	100.6	0.5	418.0	220.4	214.7
Q1 07	401.2	200.0	106.1	87.7	4.9	398.7	211.6	209.1
	Real growth compared with previous year, per cent							
2002	0.5	1.5	2.1	0.1	...	1.7	4.1	7.5
2003	0.4	1.0	0.7	-0.2	...	0.0	-1.0	-1.6
2004	2.1	4.7	1.6	5.6	...	4.1	2.2	7.0
2005	3.1	4.2	1.1	9.6	...	4.4	7.3	10.8
2006	3.2	3.4	1.2	11.2	...	5.1	9.6	14.0
Q1 06	5.0	5.1	1.5	14.0	...	6.0	14.9	17.6
Q2 06	2.3	3.9	0.8	10.8	...	4.5	8.4	13.7
Q3 06	2.8	1.8	1.0	10.9	...	5.2	7.2	12.4
Q4 06	2.9	3.0	1.5	9.6	...	4.7	8.6	12.8
Q1 07	1.8	2.1	2.0	4.3	...	3.2	6.0	9.0
	Real growth compared with previous quarter (seasonally adjusted), per cent							
Q1 06	1.7	1.8	0.0	3.2	...	1.7	4.1	4.4
Q2 06	0.9	2.1	0.0	4.0	...	2.0	2.8	4.1
Q3 06	0.3	-1.5	0.6	0.7	...	-0.4	-0.3	0.0
Q4 06	0.1	0.7	0.8	1.4	...	0.9	2.0	3.9
Q1 07	0.5	0.8	0.5	-1.8	...	0.1	1.3	0.8

EU-HARMONIZED INDEX OF CONSUMER PRICES (HICP) AND UNDERLYING INFLATION (IMI) Table 20

	HICP							Index of net retail prices[1]		
		Subcomponents:								
					Administered prices		HICP excl. energy, food and administered prices[3]	Index of net retail prices excl. energy, food and administered prices[3]	Split into[4]:	
	Total	Energy	Food	Core inflation[2]	Rent	Public services			Import content[5]	IMI[6]
	Weights, per cent									
	100	10.8	19.6	69.6	7.7	4.5	57.4	50.7	16.2	34.5
	Year-on-year growth, per cent									
2002	2.4	2.1	1.8	2.6	2.6	5.0	2.5	2.5	0.1	3.6
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
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

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

[1] Prices in the index of net retail prices are compiled excluding indirect taxes and subsidies.

[2] Core inflation is defined as the increase in HICP excluding energy and food.

[3] Goods and services excluding energy, food and administered prices constitute 57.4 per cent of HICP's weight basis and 51.7 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.

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

[5] The indirect energy content is included in the import content.

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

SELECTED MONTHLY ECONOMIC INDICATORS — Table 21

	Unemployment	Quantity index		Forced sales of real property	New passenger car registrations	Consumer confidence indicator	Composite cyclical indicator for		
		Manufacturing industry [1]	Retail trade				Manufacturing industry	Building and construction	Service
	Per cent of labour force	2000=100	2000=100	Number		Balance per cent			
2002	5.2	102.9	103.6	3,041	111,598	1	-4	-14	5
2003	6.2	102.5	107.8	3,039	96,501	1	-6	-18	-2
2004	6.4	102.1	113.4	2,640	122,543	7	3	-5	13
2005	5.7	103.8	120.1	1,874	148,578	9	1	7	20
2006	4.5	108.0	124.0	1,231	156,714	10	9	21	24
				Seasonally adjusted					
Dec 06	3.9	109.6	129.1	73	12,495	9	11	21	23
Jan 07	3.9	115.3	124.3	89	13,001	9	14	21	22
Feb 07	3.9	112.9	123.6	81	13,053	9	9	13	25
Mar 07	3.8	116.7	128.1	79	13,086	11	8	11	23
Apr 07	3.7	112.8	126.1	130	11,227	8	3	5	20
May 07	...	...	...	114	...	8	4	4	20

[1] Excluding shipbuilding.

SELECTED QUARTERLY ECONOMIC INDICATORS — Table 22

	Employment		Hourly earnings			Property prices (purchase sum, one-family dwellings)
	Total	Private	All sectors in Denmark, total	Manufacturing industry in Denmark	Manufacturing industry abroad	As a percentage of property value 1995
	1,000 persons		1996=100			
2002	2,784	1,932	128.5	128.5	120.4	168.0
2003	2,748	1,909	133.3	133.8	124.1	173.2
2004	2,748	1,908	137.4	138.0	127.5	188.6
2005	2,767	1,930	141.4	141.8	130.7	221.9
2006	2,820	1,984	145.8	146.2	134.0	267.6
			Seasonally adjusted			
Q1 06	2,795	1,959	144.2	144.4	132.9	254.7
Q2 06	2,806	1,970	144.9	145.6	133.6	270.3
Q3 06	2,824	1,989	146.5	146.7	134.3	275.5
Q4 06	2,852	2,017	147.4	147.8	135.1	269.9
Q1 07	2,878	2,042	...	149.5	135.8	...
			Change compared with previous year, per cent			
2002	-0.1	-0.4	3.9	4.0	2.9	3.7
2003	-1.3	-1.2	3.7	4.2	3.0	3.1
2004	0.0	0.0	3.1	3.1	2.7	8.9
2005	0.7	1.2	2.9	2.7	2.5	17.6
2006	1.9	2.8	3.1	3.1	2.5	20.6
Q1 06	1.6	2.5	2.9	2.9	2.2	25.0
Q2 06	1.7	2.5	3.2	3.2	2.8	25.4
Q3 06	1.8	2.7	3.1	3.2	2.6	20.9
Q4 06	2.4	3.4	3.1	3.2	2.6	12.3
Q1 07	3.0	4.2	...	3.6	2.2	...

EXCHANGE RATES — Table 23

	EUR	GBP	SEK	NOK	USD	JPY	CHF
	Kroner per 100 units						
	Average						
2002	743.04	1,182.10	81.12	99.03	788.12	6.2969	506.47
2003	743.07	1,074.99	81.45	93.03	658.99	5.6840	488.88
2004	743.98	1,096.69	81.54	88.90	598.93	5.5366	481.96
2005	745.19	1,090.02	80.29	93.11	600.34	5.4473	481.30
2006	745.91	1,094.32	80.62	92.71	594.70	5.1123	474.22
Dec 06	745.49	1,107.96	82.49	91.39	564.24	4.8154	466.84
Jan 07	745.39	1,123.70	82.10	90.05	573.47	4.7613	461.42
Feb 07	745.41	1,115.95	81.12	92.17	570.16	4.7299	459.80
Mar 07	744.94	1,095.18	80.11	91.59	562.59	4.7992	462.01
Apr 07	745.29	1,097.13	80.70	91.80	551.11	4.6359	455.05
May 07	745.18	1,093.81	80.95	91.55	551.24	4.5669	451.53

EFFECTIVE KRONE RATE — Table 24

Average	Nominal effective krone rate	Consumer-price indices: Denmark	Consumer-price indices: Abroad	Real effective krone rate based on consumer prices	Real effective krone rate based on hourly earnings	Consumer-price index in the euro area
	1980=100					2005=100
2002	97.7	229.9	216.5	103.8	103.5	93.8
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	107.6	109.3	100.0
2006	101.6	246.2	232.7	107.7	110.1	102.2
Dec 06	102.3	247.3	234.4	107.8	110.9	103.0
Jan 07	102.1	246.4	234.0	107.5	...	102.5
Feb 07	102.3	249.1	234.9	108.5	...	102.8
Mar 07	102.8	250.2	236.1	108.9	...	103.5
Apr 07	103.1	250.6	237.1	108.8	...	104.2
May 07	103.1	251.1	...	...	...	...
	Change compared with previous year, per cent					
2002	0.9	2.4	1.7	1.6	2.0	2.2
2003	3.6	2.1	1.7	3.9	4.7	2.1
2004	1.0	1.2	1.7	0.4	1.3	2.2
2005	-0.6	1.8	1.9	-0.6	-0.5	2.2
2006	0.0	1.9	2.0	0.0	0.7	2.2
Dec 06	1.5	1.8	1.9	1.0	1.7	1.9
Jan 07	1.2	1.8	1.9	0.9	...	1.8
Feb 07	1.6	1.9	2.0	1.3	...	1.8
Mar 07	1.7	2.0	2.2	1.3	...	1.9
Apr 07	1.6	1.7	2.1	1.0	...	1.9
May 07	1.3	1.8	...	...	...	...

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

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 database
A statistics database supplements the above statistical publications, and 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.

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.